APPROVED TRAINING ORGANIZATION
ATO

TRAINING MANUAL

KAAN-ATOD-01

Rev - 8

26.02.2025

APPROVAL PAGE

This manual has been prepared in compliance with the national and international references and standards.

We are aware that DGCA will approve our activities as long as they are compliant with the rules and regulations and; has the right of suspending, changing or cancelling our privileges in the presence of any inconvenience .

In case of any changes in the procedures and activity address; including the scope, the mentioned change will be inserted into this manual and will be sent for approval to DGCA.

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Ek

SİVİL HAVACILIK GENEL MÜDÜRLÜĞÜ
DIRECTORATE GENERAL OF CIVIL AVIATION

ONAY SERTİFİKASI
APPROVAL CERTIFICATE

EĞİTİM EL KİTABI
TRAINING MANUAL

KAAN HAVACILIK SANAYİİ VE TİCARET A.Ş.

Yayın Tarihi *Issue Date*	Revizyon No *Revision No*
26.02.2025	Rev. 08

Bu El Kitabı, SHT-ORA'ya uygun olarak incelenmiş ve değerlendirilmiş olup; Uçuş Operasyon Daire Başkanlığı tarafından kabul edilmiştir.

This Manual has been inspected and evaluated in accordance with SHT-ORA and accepted by the Flight Operations Department.

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T.C. ULAŞTIRMA VE ALTYAPI BAKANLIĞI
bağlı kuruluşudur.

T.C.
ULAŞTIRMA VE ALTYAPI BAKANLIĞI
Sivil Havacılık Genel Müdürlüğü
Uçuş Operasyon Daire Başkanlığı

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Konu : El Kitabı Revizyon Onayı

KAAN HAVACILIKA

İlgi : Kaan Havacılık'ın 27.02.2025 tarihli ve KAAN-017-ATO-SHGM-25 ATO Egt El K Rev-8b_26.02.2025_01.24 sayılı yazısı.

İlgi'de kayıtlı yazınız ile Kaan Havacılık Onaylı Eğitim Organizasyonu (ATO) bünyesinde kullanılan Eğitim El Kitabının revize edildiği ve Genel Müdürlüğümüz onayına sunulduğu belirtilmektedir.

ATO Eğitim El Kitabı üzerinde yapılan inceleme sonucunda, 26.02.2025 tarih ve 08 revizyon numaralı ATO Eğitim El Kitabı onaylanmış olup, onay belgesi Ek'te gönderilmiştir.

Bilgilerinizi ve gereğini rica ederim

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0.2 REVISION LIST

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0	29.12.2017	All Pages (Initial Issue)	Total Revision due to SHT and EASA Part-FCL	Kadir ERDOĞAN
1	19.09.2018	İ-ii, vi-viii, xxii 1-35, 1-102, 5-17, 5-18	- Revision law SHT-FTL/HG - Assign A/C for training (TC-HKI, TC-HKT)	F. Ersel ÇINAR
2	01.04.2019	İ- -viii, x-xi, xiv, xx-xxii, 1-11, 13, 19-21, 30-31, 33, 37-38, 40, 49, 2-20, 22, 5-14, 15	- Revision law SHT-KONTROL PİLOTLUĞU Directives - New type for training (KAMOV KA32)	Kadir ERDOĞAN
3	20.03.2020	i-vii, xx, xxii, 1-11, 1-21, 1-32...33, 1-37, 1-67, 5-2…9, 5-15…20, 5-23, 5-26	- ATO HT Change - Removal of ENF-480 from Authorized Types - Updating Type Refresher Requirements - Principles to be applied in case of interruption of Flight Training - Form Revisions	İsmail TÜRK
4	01.09.2021	i-ii, vi-ix, xx-xxii, 1-9..11, 2-A119, AW109, AW139, KA32-1..22 5-27..30 5-31..54	- Training Authorization Request and Approval form - Helicopter Type Rating Course Program Revisions - separation of Briefing and Flight Maneuvers of Types EK-7 Training program, theoretical knowledge and flight/simulator – weekly programs, - - Weekly and Daily Theoretical Knowledge and Flight Training Programs	Seyit Emrah CANBAZGİL
5	02.06.2022	All Pages Especially; 1-12..15, 5-34..39, 5-41, 45	English Version, complete revision Helicopter Initial, Additional Type Rating, Multi Engine Differences Training ground and flight training hours revised according to related OSD documents	Seyit Emrah CANBAZGİL
6	08.12.2023	0-1..8, 10, 0-12 0-21..22 1-1..3 1-5, 10…15, 17 1-20, 22 1-23, 24 1-26…29 1-31…41 1-48 5-42, 53, 54 5-63, 64 5-67, 68	Cover, Rev. List, Curr.PL, Definitions, Training Authority Request Course Objectives, Start Conditions, Training Subjects / Programs, TRE Theo/Pract, Hlcp TR Periods add NOTE and FLT TRN of EPIC Phase Differ TR iaw AW139-OSD-Rev-E, Extension, Durations, TRI Course Detailed TRE Standardisation, Detailed Theo. Know. Exam procedure Revised Ground & Refreshment Tr Form TRI Initial / Additional Program New TRE Standardization Subjects	Seyit Emrah CANBAZGİL
7	23.04.2024	0-1…8, 10…13 0-21…22 1-18…19, 1-29…30 2-71..72, 5-32, 5-37...39, 45, 55 5-65…66	Cover, Rev. List, Curr.PL, Definitions KA32 type out of approved rates, KA32 type out of approved rates, Instructor Competency Assessment (re-numberage) Refreshment Tr Evaluation Form (new design) KA32 type out of approved rates TRI Renewal/Revalidate Flt Programs	Seyit Emrah CANBAZGİL
8	26.02.2025	0-7…8 1-2, 4-5, 10-13, 32-37, 54, 57-58 1-19 B, 1-22, 22 B	Rev. List, Current Page List, SHT/Part-FCL related correction/revisions New A119 Family Difference Training table added, New A119 Master Difference Training table added.	Kadir ERDOĞAN

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0.4 DEFINITIONS

- "**Aircraft**" means any machine which can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.
- "**Airmanship**" means the consistent use of good judgement and well-developed knowledge, skills and attitudes to accomplish flight objectives.
- **Approach and Landing Phase :** The period of the flight from FATO to 1000 feet altitude.
- **Approved Training Organization :** An organization qualified for the issue or continuation of an approval to provide training for pilot licenses and associated ratings and certificates;
- "**Assessment of competence**" means the demonstration of skills, knowledge and attitude for the initial issue, revalidation or renewal of an instructor or examiner certificate.
- **Authority:** Directorate General of Civil Aviation (DGCA);
- **Balked Landing:** A landing maneuver that is unexpectedly discontinued below DA(H)/MDA(H) or beyond MAP;
- **'Category of Aircraft'** means a categorization of aircraft according to specified basic characteristics, for example aeroplane, powered-lift, helicopter, airship, sailplane, free balloon;
- **'Cat A With Respect To Helicopters'** means a multi-engine helicopter designed with engine and system isolation features specified in the applicable airworthiness codes and capable of operations using take-off and landing data scheduled under a critical engine failure concept that assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off in the event of engine failure;
- **'Category B With Respect To Helicopters'** means a single-engine or multi-engine helicopter that does not meet category A standards. Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure, and unscheduled landing is assumed;
- **Commercial Air Transport:** An aircraft operation involving the transport of passengers, cargo, or mail for remuneration or hire;
- "**Competency**" means a combination of skills, knowledge and attitude required to perform a task to the prescribed standard.
- **Completed Take-Off :** To continue safe take-off by evaluating the performance without aborting when the engine fails at TDP;
- **Computer Based Training:** A type of education in which the student learns by executing special training programs on a computer approved by DGCA;
- **Continuation of an Approval** to provide training for pilot licenses and associated ratings and certificates;
- **Credit** means the recognition of prior experience or qualifications;
- **Decision Altitude/Height (DA/H) :** A specified altitude or height in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established;
- **Defined Point After Take-off (DPATO) :** The point, within the take-off and initial climb phase, before which the helicopter's ability to continue the flight safely, with the critical engine inoperative, is not assured and a forced landing may be required;
- **Defined Point Before Landing (DPBL)** means the point within the approach and landing phase, after which the helicopter's ability to continue the flight safely, with the critical engine inoperative, is not assured and a forced landing may be required;
- **Examiner Pilot :** Instructor pilot designated to conduct pilots'/candidates' skill, proficiency tests and Instructor / Examiners' assessment of competency tests whose privileges are approved by DGCA;
- **Final Approach and Take-Off Area (FATO) :** Defined area for helicopter operations, over which the final phase of the approach maneuver to hover or land is completed, and from which the take-off maneuver is commenced;
- **Flight Crew Member :** A licensed crew member charged with duties essential to the operation of an aircraft during flight time;
- **Flight Duty Period :** The period of the flight crew from the beginning of the duty time till the end of the flight including pre-flight preparations;
- **Flight Instructor:** Flight Instructors are pilots who are authorized to carry out flight instruction for issuance,

- **Flight Manual'** is a manual associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft
- **Flight Plan:** A written statement (as by a pilot) of the details of an intended flight usually filed with an authority;
- **Flight Simulation Training Device (FSTD):** A training device which is a full flight simulator (FFS), a flight training device (FTD) or a flight and navigation procedures trainer (FNPT);
- **'Flight Time – Helicopter'** means the total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped;
- **'General Aviation (GA)'** means all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire;
- "**Helicopter**" means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.
- '**Helideck**' means a FATO located on a floating or fixed offshore structure;
- **'Heliport'** is an aerodrome, or a defined area on a structure, intended to be used wholly or in part for the arrival, departure, and surface movement of helicopters;
- **Heliport Operating Minima :** Operational limits of a heliport depending on visibility and the lateral/vertical distance from the clouds;
- **In Class Training:** The training in ATO by the participation of trainees and the instructors of which the time and date is pre-determined;
- **'Instrument Flight Time'** means the time during which a pilot is controlling an aircraft in flight solely by reference to instruments;
- **'Instrument Meteorological Conditions IMC'** are meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions (VMC);
- **Landing Decision Point – LDP** means the point used in determining landing performance from which, an engine failure having been recognized at this point, the landing may be safely continued or a balked landing initiated;
- "**Line flying under supervision" (LIFUS)** means line flying after an approved zero flight time type rating training course or the line flying required by an operational suitability data (OSD) report.
- **Local Day - Rest** : The 24 hours period commencing at 00:00 (local time);
- **Local Night – Rest** : Any 8 hours of falling between [22:00 and 08:00] local time (for example 22:00-06:00, 23:00-07:00 or 00:00-08:00 etc.),
- **Master Minimum Equipment List (MMEL)**: A list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design which identifies items which individually may be unserviceable at the commencement of a flight;
- **Member Country**: Turkey and EASA member countries;
- **Minimum Descent Altitude/Height (MDA/H) :** A specified altitude or height in a non-precision approach or circling approach below which descent must not be made without the required visual reference;
- **Minimum Equipment List (MEL) :** A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative (which is) prepared by an operator in conformity with, or more restrictive than the MMEL established for the aircraft type;
- '**Ministry**' is Ministry of Transport and Infrastructure for Directorate General of Civil Aviation;
- "**Multi-pilot operation**" means an operation requiring at least two pilots using multi-crew cooperation in either a multi-pilot or a single-pilot aircraft.
- "**Multi-crew cooperation**" (MCC) means the functioning of the flight crew as a team of cooperating members led by the pilot-in-command.
- "**Multi-pilot aircraft**": helicopters, airships and powered-lift aircraft, it means an aircraft which is certificated for operation with a minimum crew of at least two pilots or which is required to be operated with at least two pilots in accordance with Regulation (EU) No 965/2012.
- **'Night'** means the period between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be prescribed by the appropriate authority, as defined by the Member State;

- **Operating Site:** A site, other than an aerodrome, selected by the operator or pilot-in command or commander for landing, take-off and/or external load operations;
- **Operation in Performance Class 1:** An operation that, in the event of failure of the critical engine, the helicopter is able to land within the rejected take-off distance available or safely continue the flight to an appropriate landing area, depending on when the failure occurs;
- **Operation in Performance Class 2:** An operation that, in the event of failure of the critical engine, performance is available to enable the helicopter to safely continue the flight, except when the failure occurs early during the take-off maneuver or late in the landing maneuver, in which cases a forced landing may be required;
- **Operation in Performance Class 3:** An operation that, in the event of an engine failure at any time during the flight, a forced landing may be required in a multi-engine helicopter and will be required in a single-engine helicopter;
- **Operator:** A person, organization, or enterprise engaged in or offering to engage in aircraft operation;
- "**OSD**" means the operational suitability data established in accordance with Annex I (Part-21) to Regulation (EU) No 748/2012.';
- **Pilot:** To manipulate the flight controls of an aircraft during flight time ;
- **Pilot-in-Command :** The pilot designated as being in command and charged with the safe conduct of the flight;
- **Proficiency Check:** The demonstration of skill to revalidate or renew ratings, and including such oral examination as may be required;
- **Qualification:** The level of technical ability of an FSTD as defined in the compliance document;
- **Refresher Training:** The training needed to renew the expired privileges of flight crew.
- **Renewal** : To renew the privileges which have expired;
- **Revalidation:** The administrative action taken within the period of validity of a rating or certificate which allows the holder to continue to exercise the privileges of a rating or certificate for a further specified period consequent upon the fulfilment of specified requirements;
- **Runway Visual Range (RVR):** The range over which the pilot of an aircraft on the center line of a runway can see the runway surface markings or the lights delineating the runway or identifying its center line;
- **'Safe Forced Landing'** means an unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface;
- **Single Day-Off – Rest**: The period being free of any duty and comprising of one local day and two local nights;
- **Skill test:** The demonstration of skill for a license or rating issue, including such oral examination as may be required;
- **Take-off and Initial Climb Phase :** Phase of the flight from take-off point to 1000 feet altitude.
- **Take-off Decision Point (TDP) :** The point used in determining take-off performance from which, an engine failure having been recognized at this point, either a rejected take-off may be made or a take-off safely continued;
- **Test Flight Training:** The training required by the pilots to be able to perform test flights;
- **Third Party Country:** The countries other than Turkey and EASA member countries;
- "**Threat**" means events or errors which occur beyond the influence of the flight crew, increase operational complexity and which must be managed to maintain the margin of safety.
- "**Threat management**" means the process of detecting and responding to the threats with countermeasures which reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired aircraft states.
- **Type Rating Course** : The course needed to have a Type Rating;
- **'Type of aircraft'** means a categorization of aircraft requiring a type rating as determined in the operational suitability data, and which include all aircraft of the same basic design including all modifications thereto except those which result in a change in handling or flight characteristics;
- **'Variant'** means an aircraft or a group of aircraft within the same pilot type rating that has differences to the base aircraft requiring difference training or familiarization training;
- **'Visual Meteorological Conditions (VMC)'** means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than the specified minima;

0.5 ABBREVIATIONS

A	Aeroplane
A/C	Aircraft
ACAS	Airborne collision avoidance system
AD	Airworthiness directive
ADS	Air Data System
AeMC	Aeromedical Center
AEO	All Engine Operative
AHRS	Attitude and Heading Reference System
AIS	Aeronautical information service
AltMOC	Alternative Means of Compliance
AM	Accountable manager
AMC	Acceptable Means of Compliance
AME	Authorized Medical Examiner
AOB	Angle of Bank
APU	Auxiliary Power Unit
APP	Appendix
ARA	Authority requirements for aircrew
ATC	Air Traffic Control
ATO	Approved Training Organization
ATP	Airline Transport Pilot
ATPL	Airline Transport Pilot License
CBT	Computer-based training
CFI	Chief Flying Instructor
CGI	Chief Ground Instructor
CM	Compliance Monitoring
CMP	Compliance Monitoring Program
CMS	Compliance Monitoring System
CONT	Control
CPL	Commercial Pilot License
CPL/IR	Commercial Pilot License/ Instrument Rating
CQB	Central Question Bank
CRM	Crew Resource Management
CS	Certification Specification
CTKI	Chief Theoretical Knowledge Instructor
DBRF	De-Briefing
DG	Dangerous goods
DGCA	Directorate General of Civil Aviation
DME	Distance Measurement System
DPATO	Defined Point After Take-off
DPBL	Defined Point Before Landing
DU	Display Unit
EASA	European Union Aviation Safety Agency
EFIS	Electronic Flight İnstrument System
EGPWS	Enhanced Ground Proximity Warning System
ERP	Emergency Response Plan
FATO	Final Approach And Take-off Area
FCL	Flight Crew Licensing
FD	Flight Director
FE	Flight Examiner
FFS	Full Flight Simulator
FI	Flight Instructor
FIE	Flight Instructor Examiner
FM	Flight Maneuvers
FMS	Flight Management System
FNPT	Flight and Navigation Procedures Trainer
FRT	Flight Renewal Training
FS	Flight Simulator
FSTD	Flight Simulation Training Device

FT	Flight Training
FTD	Flight Training Device
FTL/HG	Flight Time Limitation
GM	Guidance Material
GPS	Global Positioning System
(H)	Helicopter
HEMS	Helicopter Emergency Medical Service
HHO	Helicopter Hoist Operation
HT	Head of Training
ICAO	International Civil Aviation Organization
IEM	Interpretative and Explanatory Material
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IOS	Instructor Operation Station
IR	Instrument Rating
IRE	Instrument Rating Examiner
IRI	Instrument Rating Instructor
IRS	Instructor Refresher Seminar
LDP	Landing Decision Point
LIFUS	Line Flying Under Supervision
LOFT	Line Orientated Flight Training
LVO	Low Visibility Operation
MAP	Missed Approach Point
MCC	Multi Crew Co- operation
MCDU	Multifunction Control Display Unit
ME	Multi- engine
MEL	Minimum Equipment List
MMEL	Master Minimum Equipment List
MPA	Multi-Pilot Aeroplane
MPH	Multi-Pilot Helicopter
MPL	Multi Pilot License
MTOM	Maximum Take-Off Mass
Nm	Nautical Miles
OM	Operations Manual
OMM	Organization’s Management Manual
OPC	Operator proficiency check
ORA	Organization requirements for aircrew
ORO	Organization Requirements For Air Operations,
OSD	Operational Suitability Data
OTD	Other training device
Part-ARA	1178/2011 Commission Regulation Appendix-6
Part-FCL	1178/2011 Commission Regulation Appendix 1
Part-MED	1178/2011 Commission Regulation Appendix-4
Part-ORA	1178/2011 Commission Regulation Appendix-7
Part-21	748/2012 Commission Regulation Appendix-1
PF	Pilot Flying
PFB	Preflight Briefing
PFC	Preflight Checks
PIC	Pilot In Command
PICUS	Pilot In Command Under Supervision
PNF / PM	Pilot Not Flying / Pilot Monitoring
PPL	Private Pilot License
PSB	Post Flight Briefing
PSC	Post Shutdown Checks
RFM	Rotorcraft Flight Manual
RPT	Repetition of Past Training
R/T	Radiotelephony
SCAS	Stability Control Augmentation System
SE	Single- Engine / Tek Motor
SEP/H	Single Engine Piston-Helicopter

SET/H	Single Engine Turbine-Helicopter
SFE	Synthetic Flight Examiner
SFI	Synthetic Flight Instructor
SHGM	Directorate General of Civil Aviation (DGCA)
SHT-FCL	Flight Crew Licensing Regulation
SHT-ORA	Flight Crew Organization Requirements Regulation
SIM	Simulator
SMM	Safety management manual
SOP	Standard operating procedure
SPA	Single-Pilot Aeroplane
SPH	Single-Pilot Helicopter
SPIC	Student Pilot In Command
STD	Synthetic Training Devices
SHT-FCL	Flight Crew Licensing Directive
SHT-ORA	DGCA Directive Organization Requirements of Aircrew
TAWS	Terrain awareness warning system
TCAS	Traffic Alert And Collision Avoidance System
TDP	Take-off Decision Point
TEM	Threat and Error Management
TKT	Theoretical Knowledge Training
TKI	Theoretical Knowledge Instructor
TKTP	Theoretical Knowledge Training Program
TLT	Teaching and Learning Training
TR	Type Rating
TKRT	Theoretical Knowledge Renewal Training
TRE	Type Rating Examiner
TRI	Type Rating Instructor
TRM	Training Manual
TT	Technical Training
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VTOSS	Takeoff Safety Speed for Category A Rotorcraft
ZFTT	Zero Flight Time Training

0.6 TRAINING MANUAL (ORA.ATO.130, AMC1 ORA.ATO.230(a))

0.6.1 General Information

a. KAAN Approved Training Organization Operation Manual, is prepared based on;

- SHT-ORA ATO privileges and,
- SHT-FCL Class and Type ratings.

b. The following sources were also used while preparing the manual:

- EASA FCL PART ORA AMC1 ORA.ATO.230(a)
- SHT-FTL/HG Flight and Duty Period Limitation for Air Taxi and General Aviation Operators Directive

c. This Manual is written in English language.
d. This Manual is the basics of KAAN Approved Training Organization Training procedures.
e. Directorate General of Civil Aviation keeps a copy of this Manual, and all the updates are sent by KAAN AIR.
f. This manual comprises of 6 sections.

- Section 0 General
- Section 1 Training Plan
- Section 2 Briefing and Flight Maneuvers
- Section 3 Synthetic Flight Training
- Section 4 Theoretical Knowledge Instruction
- Section 5 Appendix and Forms

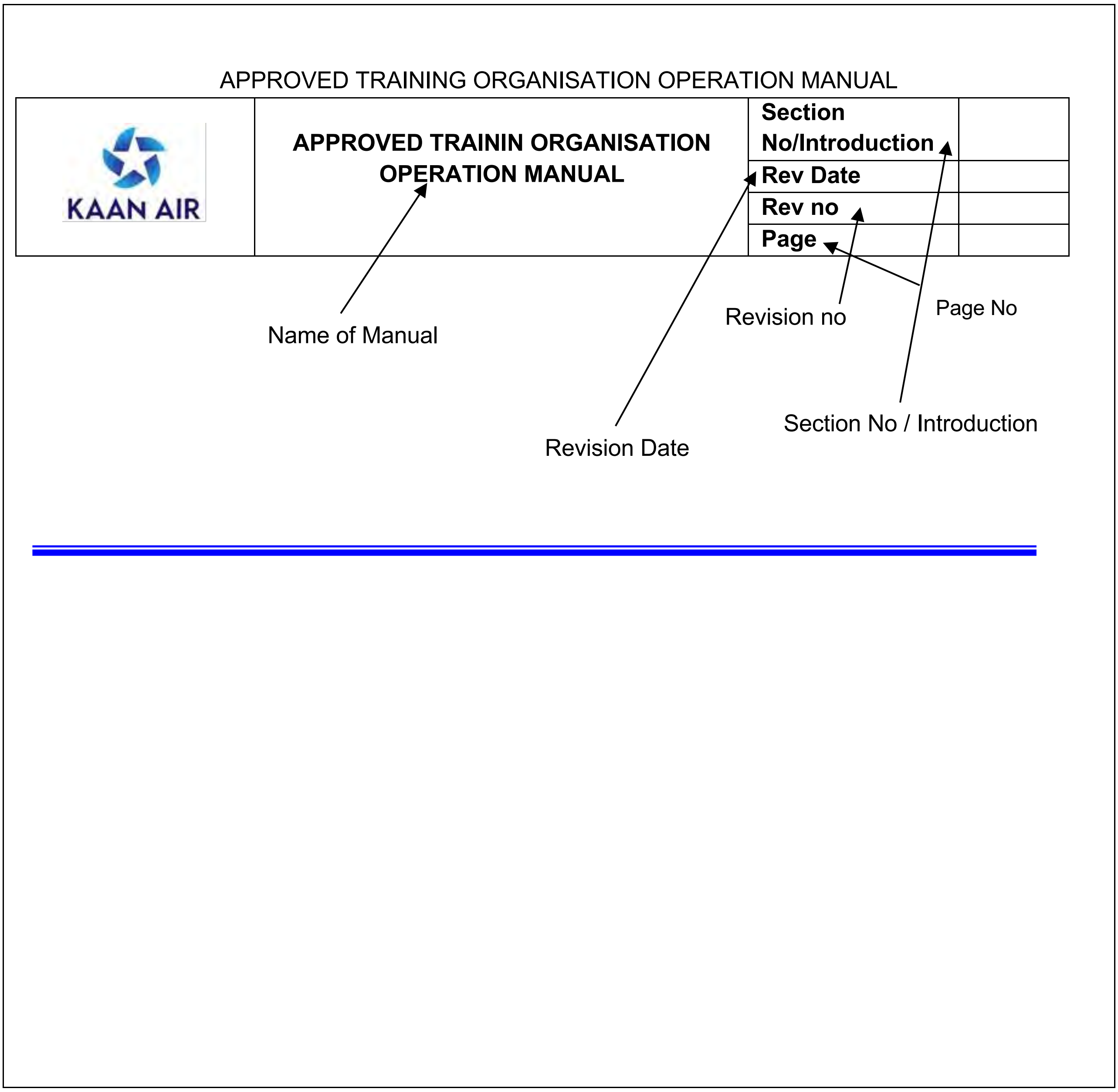
g. Limitations on flight and training time
Examiners, instructor pilots, candidates and approved training organizations will comply with the restrictions set by the General Directorate in their training activities.

h. Training Program (ORA.ATO.125)

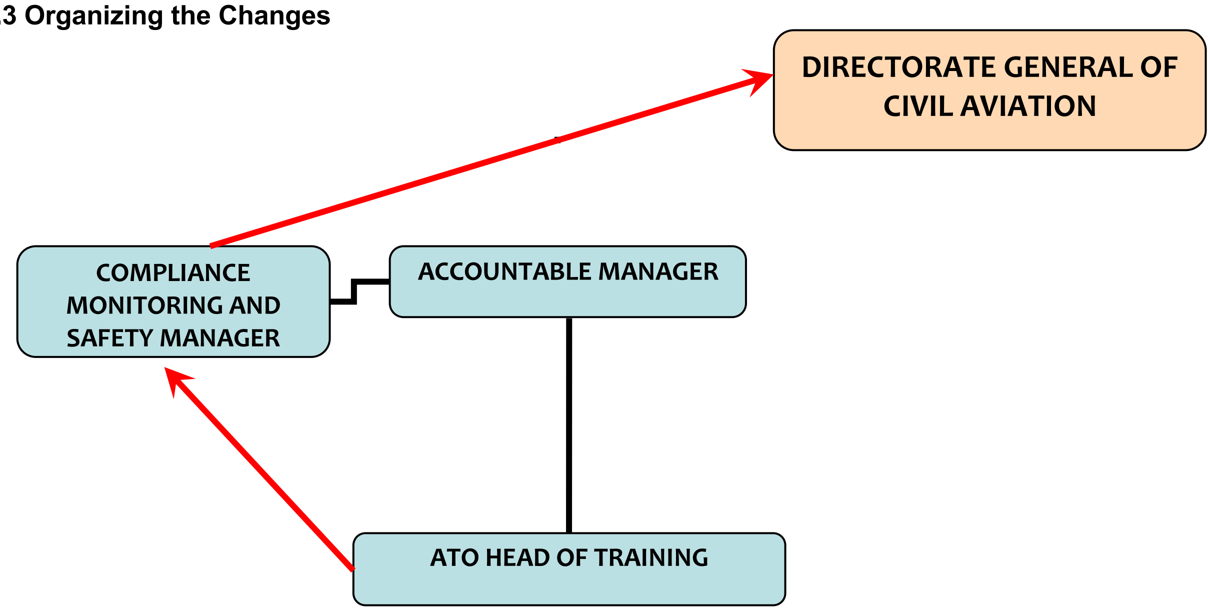
- A training program has been developed for each course type offered.
- The training program will be in accordance with the relevant requirements of SHT-FCL and for test flight training will be SHT-21.

0.6.2 Page Design

KAAN Approved Training Organization Operation Manual page design is follows,



0.6.3 Organizing the Changes

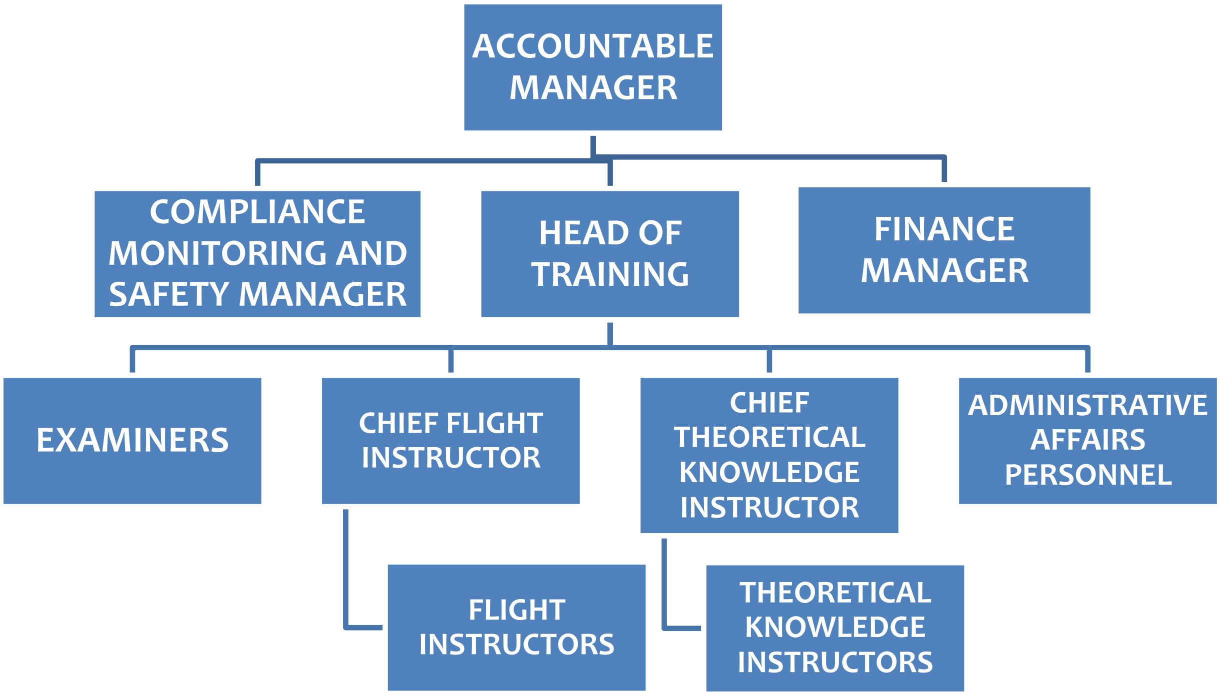


- **a.** Head of Training is responsible to make the related changes to keep updated the Operation Manual according to current directives, regulations and laws.
- **b.** The mentioned changes are sent to Directorate General of Civil Aviation by Compliance Monitoring and Safety Manager after reviewing.
- **c.** Changes are officially valid after the approval by Directorate General of Civil Aviation.
- **d.** Changes are recorded to 0.2 Revision List.
- **e.** Current Pages are shown for the users' attention at item 0.3.
- **f.** The updated part is shown in red colored words and with a vertical line on the page.

0.7 DISTRIBUTION LIST

a.	TR DGCA Directorate General of Civil Aviation	(Original and Digital Copy)
b.	ATO Head of Training	(Original and Digital Copy)
c.	Accountable Manger	(Digital Copy)
d.	Compliance Monitoring and Safety Manager	(Digital Copy)
e.	Continuing Airworthiness (CAMO) Manager	(Digital Copy)
f.	Digital Library	(Digital Copy)

0.8 TRAINING ORGANISATION (KAAN ATO) ADMINISTRATION (FUNCTION AND MANAGEMENT) (SCHEMA) ORA.GEN.200



0.9 TRAINING AUTHORITY REQUEST AND APPROVAL FORM (FR.25)

1. BAŞVURU SAHİBİ / *APPLICANT*	
ATO Adı: *ATO Name:*	*KAAN HAVACILIK SANAYİ VE TİCARET A.Ş.*
Adres: *Address:*	*AYAZAĞA MAH. 208 SOK. NO: 1 SARIYER 34396 İSTANBUL*

EK-1 / *ANNEX I*	
Eğitim Tesisleri / *Training Sites* **Eğitim kurslarının nerede verileceğini listeleyiniz. Lütfen her bir eğitim tesisi için tam adresi yazınız.** *List of sites where the training courses will be provided. Please enter the full address details for each training site.*	
1.	AYAZAĞA MAH. 208 SOK. NO: 1 SARIYER 34396 İSTANBUL

EK-2 / *ANNEX II*		
Eğitim Kursları / *Training Courses* **Verilecek eğitim kurslarını listeleyiniz. Lütfen kurs adını yazınız ve eğitimin tipini seçiniz.** *List of training courses to be provided. Please enter the course name and select the type(s) of training.*		
	Kurs Adı / Course Name	**Eğitim Tipi / Type of Training**
1.	LEONARDO **A119** TYPE RATING, TRI(H)	X Teorik / Theory X Uçuş /~~Simülatör~~ / Flight / ~~Simulation~~
2.	LEONARDO **AW109** TYPE RATING, TRI(H)	X Teorik / Theory X Uçuş /Simülatör / Flight / Simulation
3.	LEONARDO **AW139** TYPE RATING, TRI(H)	X Teorik / Theory X Uçuş /Simülatör / Flight / Simulation **X (FI-1H-139, FI-1H-239)**
4.	EXAMINER STANDARDISATION COURSE (H)	X Teorik / Theory X Uçuş /Simülatör / Flight / Simulation

EK-3 / *ANNEX III*				
Uçuş Öğretmenleri / *Flight Instructors* **Görev yapacak olan bütün uçuş öğretmenlerini listeleyiniz. Lütfen öğretmenin adını, lisansın türünü, lisans numarasını, öğretmenlik yetkilerini ve istihdam şeklini giriniz.** *List of flight instructors employed to provide the training courses offered. Please enter the name of the instructor, the type of License, the License number, instructional ratings and employment type.*				
	Öğretmen Adı / *Instructor Name*	**Lisans Türü ve Numarası *License Type and Number***	**Sahip Olduğu Öğretmenlik Yetkileri *Instructor Ratings Held***	**İstihdam Şekli / *Employment***
AOL-01 / It is followed by the ATO Personnel List.				

EK-4 / *ANNEX IV*

Kullanılacak havaalanları / operasyon sahaları / *Aerodrome(s) and/or operating site(s) to be used*

Eğitim kurslarını vermek için kullanılacak bütün havaalanları listeleyiniz. Lütfen eğitimlerin gerçekleşeceği havaalanlarının tam adını ve adresini giriniz.

List of aerodromes used to provide training courses. Please enter the full name and address of all aerodromes where training is taking place.

	Havaalanı / ***Aerodrome***	
1.	KAAN HELİPORT Ayazaga / İstanbul (41° 7' 34''K 28° 59' 03'''D) and Area between KAAN Heliport and Black Sea Coastline	n/a IFR approaches n/a Night flying n/a Air traffic control
2.	İSTANBUL TMA	X IFR approaches X Night flying X Air traffic control
3.	LTBU – ÇORLU AIRPORT	
4.	LTBR – YENİŞEHİR AIRPORT	
5.	DHMI APPROVED AIRPORTS	
6.	LTBW – HEZARFEN AIRPORT	n/a IFR approaches n/a Night flying X Air traffic control
7.	THK / ANTALYA-KARAİN HAVAALANI	n/a IFR approaches n/a Night flying n/a Air traffic control

EK-5 / *ANNEX V*

Uçuş Operasyon Tesisleri / *Flight Operations Accommodation*

Uçuş operasyon tesisi olarak kullanılan tüm odaları listeleyiniz. Lütfen odaların yerini, kullanım amacını, sayısını ve büyüklüğünü belirtiniz. .

List of all rooms used as flight operations accommodation. Please enter the location, purpose of use, number of rooms and size.

	Yer / ***Location***	**Kullanım Amacı /** ***Purpose of use***	**Sayı /** ***Number***	**Boyut (boy x en)** ***Size (length x width)***
1.	KAAN HELİPORT	ATO, TİCARİ UÇUŞ, BAKIM	1	220,00 m x 100,00 m

EK-6 / *ANNEX VI*

Teorik Eğitim Tesisleri / *Theoretical Instruction Facilities*

Teorik eğitim tesisi olarak kullanılan tüm derslikleri listeleyiniz. Lütfen dersliklerin yerini, sayısını ve büyüklüğünü belirtiniz. .

List of all classrooms used as theoretical instruction facilities. Please enter the location, number of classrooms and size.

	Yer / ***Location***	**Sayı /** ***Number***	**Boyut (boy x en)** ***Size (length x width)***
1.	KAAN HELİPORT DERSHANE	1	5,00 m x 6,00 m
2.	KAAN HELİPORT BRİFİNG SALONU	1	6,00 m x 10,00 m

EK-7 / *ANNEX VII*

Eğitim Cihazları / *Training Devices*

Eğitim kurslarını vermek için kullanılacak bütün eğitim cihazlarını listeleyiniz. Lütfen cihazın kimliğini, hava aracı tipini ve cihazın tipini giriniz.

List of all training devices used to provide training courses. Please identify the device, the aircraft type and type of device.

	Kimlik / ***Identification***	**Hava aracı Tipi /** ***Type of Aircraft***	**Cihaz Tipi /** ***Type of Device***	
1.	FI-1H-139 (Coptersafety / FINLAND) FI-2H-139 (Coptersafety / FINLAND)	AW139 AW139	☒FFS ☐FNPT I ☐FNPT II ☐FNPT III	☐FTD 1 ☐FTD 2 ☐FTD 3 ☐BITD

EK-8 / *ANNEX VIII*

Hava aracı / *Aircraft*

Eğitim kurslarını vermek için kullanılacak bütün hava araçlarını listeleyiniz. Lütfen hava aracı tescilini ve tipini giriniz.

List of all aircraft used to provide training courses. Please identify the aircraft registration, type designation and IFR.

	Tescil / ***Registration***	**Hava aracı Sınıfı/Tipi** ***Class/Type of Aircraft***	**Ekipman /** ***Equipped***
AOL-02 / It is followed by the Aircraft List.			

1. TRAINING PLAN

1.1 OBJECTIVE OF THE COURSE (FCL.705, SHT-FCL.EK.1.6 APPENDIX 6.A.1, AMC1 FCL.930.TRI, FCL.1015)

a. Pilots with a valid helicopter pilot license or applying for a new helicopter type rating; It is to provide education and training in all three areas, including flight maneuvers, theoretical knowledge lessons and emergency procedures, in a way that reaches the desired standards.

b. Change of instrument rating from SEH/IR to MEH/IR or new MEH type with IR rating to a candidate with MEH/IR.

c. Conducting training and controls for the revalidation and renewal of licenses in the type/types of helicopters they are rated.

d. Conducting Type Rating Instructor Course and control for initial, revalidation and renewal of a Type Rating Instructor certificates. Extension of Instructor's course / Instructor authorization in the Helicopter type(s) with which they are rated.

e. Conducting Examiner Standardization Course and control for initial, revalidation and renewal of examiner certificates.

1.2 COURSE START CONDITIONS (FCL.720.H, ORA.ATO.145, FCL.915.TRI, FCL.1010, FCL.1010.TRE)

a. KAAN ATO will ensure that students meet all educational prerequisites as defined in the mandatory part of the operational eligibility data created in accordance with SHT-MED, SHT-FCL, as defined in the mandatory part of the operational suitability data established in accordance with Regulation (EU) No 748/2012.

b. Must have a valid health report according to SHT MED.

c. Must have a valid Helicopter Pilot License.

d. The following conditions must be met before the first type rating training is taken:

1.2.1 Experience requirements and prerequisites for the issue of <u>type ratings</u> – Helicopters (FCL. 720.H)

Unless otherwise determined in the operational suitability data established in accordance with SHT-21, an applicant for the issue of the first helicopter type rating shall comply with the following experience requirements and prerequisites for the issue of the relevant rating:

(a) Multi-pilot helicopters. An applicant for the first type rating course for a multi-pilot helicopter type shall:

(1) have at least 70 hours as PIC on helicopters;

(2) except when the type rating course is combined with an MCC course:

(i) hold a certificate of satisfactory completion of an MCC course in helicopters; or

(ii) have at least 500 hours of flight time as a pilot in multi-pilot operations in any aircraft category.

(3) have passed the ATPL(H) theoretical knowledge examinations.

(b) A graduate from an ATP(H)/IR, ATP(H), CPL(H)/IR or CPL(H) integrated course who does not comply with the requirement of point (a)(1), shall be entitled to undergo the type rating training course for a multi-pilot helicopter type rating and shall have the type rating issued with the privileges limited to exercising functions as co-pilot only. The limitation shall be removed once the pilot has complied with all of the following:

(1) completed 70 hours as PIC or pilot-in-command under supervision of helicopters;

(2) passed the multi-pilot skill test on the applicable helicopter type as PIC.

(c) Multi-engine helicopters. An applicant for the issue of a first type rating for a multi-engine helicopter shall:

(1) before starting flight training:

(i) have passed the ATPL(H) theoretical knowledge examinations; or

(ii) hold a certificate of completion of a pre-entry course conducted by an ATO. The course shall cover the following subjects of the ATPL(H) theoretical knowledge course:

— Aircraft General Knowledge: airframe/systems/power plant, and instrument/electronics,

— Flight Performance and Planning: mass and balance, performance;

(2) in the case of applicants who have not completed an ATP(H)/IR, ATP(H), or CPL(H)/IR integrated training course, have completed at least 70 hours as PIC on helicopters.

(d) Those who want to change the instrument rating to MEH/IR must have at least one SEH type IR.
(e) Training in Third Countries (ORA.ATO.150)

When KAAN ATO is approved to provide instrument rating (IR) training in third countries; the training program will include a acclimatization flight in Turkey or any of the member countries before the IR skill test is taken and the IR skill test will be taken in Turkey or any of the member countries.

1.2.2 Experience requirements and prerequisites for the issue of <u>Type Rating Instructor</u> – Helicopters (FCL.915.TRI)

An applicant for a TRI certificate shall:

(a) hold a CPL, MPL or ATPL pilot license on the applicable aircraft category;

(b) for TRI(H):

(1) for a TRI(H) certificate for single-pilot single-engine helicopters, either:

(i) have completed 250 hours as a pilot on helicopters; or

(ii) hold an FI(H) certificate.

(2) for a TRI(H) certificate for single-pilot multi-engine helicopters, either:

(i) have completed 500 hours as pilot of helicopters, including 100 hours as PIC in single-pilot multi-engine helicopters; or

(ii) hold an FI(H) certificate and have completed 100 hours of flight time as a pilot in multi-engine helicopters.

(3) for a TRI(H) certificate for multi-pilot helicopters, have completed 1 000 hours of flight time as a pilot on helicopters, and have either 350 hours in multi-pilot operations on any aircraft category or 100 hours of flight time as a pilot in multi-pilot operations on the type for which the TRI(H) certificate is sought.

1.2.3 Experience requirements and prerequisites for the issue of <u>Type Rating Examiner</u> – Helicopters (SHT KONTROL PILOTLUGU, FCL.1010.TRE)

Applicants for a TRE (H) certificate for helicopters shall:

(1) hold a TRI(H) certificate or, in the case of single-pilot single-engine helicopters, a valid FI(H) certificate, for the applicable type;

(2) for the initial issue of a TRE certificate, have completed 50 hours of flight instruction as a TRI, FI or SFI in the applicable type or an FSTD representing that type;

(3) in the case of multi-pilot helicopters, hold a CPL(H) or ATPL(H) and have completed 1500 hours of flight as a pilot on multi-pilot helicopters, of which at least 500 hours shall be as PIC;

(4) in the case of single-pilot multi-engine helicopters:

(i) have completed 1000 hours of flight as pilot on helicopters, of which at least 500 hours shall be as PIC;

(ii) hold a CPL(H) or ATPL(H) and, when applicable, a valid IR(H);

(5) in the case of single-pilot single-engine helicopters:

(i) have completed 750 hours of flight as a pilot on helicopters, of which at least 500 hours shall be as PIC;

(ii) hold a CPL(H) or ATPL(H).

(6) Before the privileges of a TRE(H) are extended from single-pilot operations to multi-pilot operations on the same type of helicopter, the holder shall have either:

(i) at least 100 hours in multi-pilot operations on this type; or

(ii) at least 350 hours in multi-pilot operations in any aircraft category.

(7) In the case of applicants for the first multi-pilot multi-engine TRE certificate, the 1500 hours of flight experience on multi-pilot helicopters required in (b)(3) may be considered to have been met if they have completed the 500 hours of flight time as PIC on a multi-pilot helicopter of the same type.

1.3 CREDIT OF GAINED EXPERIENCE (FCL.035, FCL.930.TRI, FCL.940.TRI)

a. Crediting of Flight Time

(1) Unless otherwise specified in this Part, flight time to be credited for a license, rating or certificate shall have been flown in the same category of aircraft for which the license, rating or certificate is sought.

(2) PIC or under instruction.

(i) An applicant for a license, rating or certificate shall be credited in full of all solo, dual instruction or PIC flight time towards the total flight time required for the license, rating or certificate.

(ii) A graduate of an ATP integrated training course is entitled to be credited with up to 50 hours of student pilot-in-command instrument time towards the PIC time required for the issue of the airline transport pilot license, commercial pilot license and a multi-engine type or class rating.

(iii) A graduate of a CPL/IR integrated training course is entitled to be credited with up to 50 hours of the student pilot-in-command instrument time towards the PIC time required for the issue of the commercial pilot license and a multi-engine type or class rating.

(3) Flight time as co-pilot or PICUS. Unless otherwise determined in this Part, the holder of a pilot license, when acting as co-pilot or PICUS, is entitled to be credited with all of the co-pilot time towards the total flight time required for a higher grade of pilot license.

(4) Crediting can be done according to SHT-1G.

b. Crediting of Theoretical Knowledge

(1) Applicants that have passed the theoretical knowledge examination for an airline transport pilot license shall be credited towards the requirements for the theoretical knowledge requirements for the light aircraft pilot license, the private pilot license, the commercial pilot license and, **except in the case of helicopters**, the IR in the same category of aircraft.

(2) Applicants that have passed the theoretical knowledge examination for a commercial pilot licence shall be credited towards the requirements for the theoretical knowledge for:

(i) the light aircraft pilot licence in the same category of aircraft;

(ii) the private pilot licence in the same category of aircraft; and

(iii) the subject 'communications' for the BIR. This credit shall include the IFR part of the subject 'communications' only if that subject was completed in accordance with point FCL.310, as applicable as of 20 December 2019.

(3) The holder of an IR or an applicant having passed the IR theoretical knowledge examination for a category of aircraft shall be fully credited towards the requirements for theoretical knowledge instruction and examination for the IR in another category of aircraft.

(4) Holders of a pilot licence shall be credited towards the requirements for theoretical knowledge instruction and examination for a licence in another category of aircraft in accordance with Appendix 1 to SHT/Part-FCL. This credit also applies to applicants for a pilot licence who have already successfully completed the theoretical knowledge examinations for the issue of that licence in another category of aircraft, as long as the theoretical knowledge examination is within the validity period specified in point FCL.025(c).

(5) By way of derogation from paragraph (b)(3), holders of an IR(A) who have completed a competency-based modular IR(A) course shall be fully credited towards the requirements for theoretical knowledge instruction and examination for an IR in another category of aircraft only if they have also passed the theoretical knowledge instruction and examination for the IFR part of the course required in accordance with point FCL.720.A.(a)(2)(ii)(A).

(6) When Appendix 1 includes a credit for the subject Communications, all of the following shall apply:

(i) such credit shall only be granted for training and examination for that subject if applicants, during previous theoretical knowledge examinations in accordance with point ARA.FCL.300 of Annex VI, have completed either the subject Communications or both subjects VFR communications and IFR communications;

(ii) applicants who have completed either only the subject VFR communications or only the subject IFR communications shall complete theoretical knowledge instruction in the subject Communications, the duration of which may be reduced based on an assessment of the applicants by the ATO. For applicants who have completed the subject VFR communications, aspects purely related to VFR communication may be reduced. For applicants who have completed the subject IFR communications, aspects purely related to IFR communication may be reduced. In any case, applicants shall complete the theoretical knowledge examination in the subject Communications.

c. TRI – Training Course

Applicants holding or having held an instructor certificate shall be fully credited towards the requirement of 25 hours of teaching and learning.

d. TRI – Revalidation and Renewal

If TRIs hold a certificate for more than one type of aircraft within the same category, the assessment of competence taken on one of those types of aircraft shall **revalidate** the TRI certificate for the other types held within the same category of aircraft, unless it is otherwise determined in the OSD.

If applicants held a certificate for more than one type of aircraft within the same category, the assessment of competence taken on one of those types of aircraft shall **renew** the TRI certificate for the other types held within the same category of aircraft, unless it is otherwise determined in the OSD.

1.4 TRAINING SUBJECTS (THEORETICAL KNOWLEDGE AND INSTRUCTION SUBJECTS)

1.4.0 Trainings Authorized by KAAN AIR Approved Training Organization (FCL.720H, FC.725, FCL.735H, FCL. 740.H, FCL.905.TRI, FCL.910.TRI, FCL.915.TRI, FCL.930.TRI, FCL.935.TRI, FCL.1010.TRE)

Helicopter Type Rating Flight Training

- - Helicopter Initial Type Rating Flight Training
  - Single Engine Turbine Helicopter (SET/H) (MTOM<3175kg) Initial Type Rating Flight Training
  - Single Pilot Multi-Engine Helicopter (SPH MET) Initial Type Rating Flight Training
- - Helicopter Additional Type Rating Flight Training
  - From Single Engine Turbine Helicopter to Single Engine Turbine Helicopter (SET/H→SET/H) Additional Type Rating Course Flight Training Program
  - From Multi Engine Turbine Helicopter to Multi Engine Turbine Helicopter (MET/H→MET/H) Additional Type Rating Course Flight Training Program
  - Multi Engine Turbine Helicopter (MET/H) Difference Flight Training Program
  - Conversion Flight Training Program of IR Rating from SEH / IR to MEH / IR
- Helicopter Type Rating Revalidation, Renewal and Operational Proficiency Checks
- Helicopter Type Rating Instructor (TRI) Flight Training Program
- Helicopter Type Rating Instructor (TRI) Revalidation and Renewal Flight Training Program
- Helicopter Type Rating Examiner (TRE) Initial, Revalidation and Renewal Flight Training Program

Theoretical Knowledge Instruction

- Helicopter Initial and Additional Type Rating Theoretical Knowledge Training Program
- Multi-Engine Helicopter (MET/H) Difference Theoretical Knowledge Training Program
- Helicopter Type Rating Instructor (TRI) Theoretical Knowledge Training
- Theoretical Knowledge Training Program for Renewal of Helicopter Type Rating
- Helicopter Type Rating Instructor (TRI) Renewal Theoretical Knowledge (Seminar) Training Program
- Helicopter Type Rating Examiner (TRE) Standardization Course Theoretical Knowledge (Seminar) Training Program

1.4.1 Helicopter Type Rating Theoretical Knowledge Lessons (AMC1 FCL.725(a))

(a) Detailed listing for helicopters structure, transmissions, rotors and equipment, normal and abnormal operation of systems:

(1) dimensions.

(2) engine including aux. power unit, rotor and transmissions; if an initial type rating for a turbine engine helicopter is applied for, the applicant should have received turbine engine instruction:

(i) type of engine or engines;

(ii) in general, the function of the following systems or components:

(A) engine;
(B) auxiliary power unit;
(C) oil system;
(D) fuel system;
(E) ignition system;
(F) starting system;
(G) fire warning and extinguishing system;
(H) generators and generator drive;
(I) power indication
(J) water or methanol injection.

(iii) engine controls (including starter), engine instruments and indications in the cockpit, their function and interrelation and interpretation;

(iv) engine operation, including APU, during engine start and engine malfunctions, procedures for normal operation in the correct sequence;

(v) transmission system:

(A) lubrication;
(B) generators and generator drives;
(C) freewheeling units;
(D) hydraulic drives;
(E) indication and warning systems.

(vi) type of rotor systems: indication and warning systems.

(3) fuel system:

(i) location of the fuel tanks, fuel pumps, fuel lines to the engines tank capacities, valves and measuring;

(ii) the following systems:

(A) filtering;
(B) fueling and defueling heating's;
(C) dumping;
(D) transferring;
(E) venting.

(iii) in the cockpit: the monitors and indicators of the fuel system, quantity and flow indication, interpretation;

(iv) fuel procedures distribution into the various tanks fuel supply and fuel dumping.

(4) air conditioning:

(i) components of the system and protection devices;

(ii) cockpit monitors and indicators;

Note: interpretation about the operational condition: normal operation of the system during start, cruise approach and landing, air conditioning airflow and temperature control.

(5) ice and rain protection, windshield wipers and rain repellent:

(i) ice protected components of the helicopter, including engines and rotor systems, heat sources, controls and indications;

(ii) operation of the anti-icing or de-icing system during take-off, climb, cruise and descent, conditions requiring the use of the protection systems;

(iii) controls and indications of the windshield wipers and rain repellent system operation.

(6) hydraulic system:

(i) components of the hydraulic system(s), quantities and system pressure, hydraulically actuated components associated to the respective hydraulic system;

(ii) controls, monitors and indicators in the cockpit, function and interrelation and interpretation of indications.

(7) landing gear, skids fixed and floats:

(i) main components of the:
(A) main landing gear;
(B) nose gear;
(C) tail gear;
(D) gear steering;
(E) wheel brake system.

(ii) gear retraction and extension;

(iii) required tyre pressure, or location of the relevant placard;

(iv) controls and indicators including warning indicators in the cockpit in relation to the retraction or extension condition of the landing gear;

(v) components of the emergency extension system.

(8) flight controls, stab- and autopilot systems: controls, monitors and indicators including warning indicators of the systems, interrelation and dependencies.

(9) electrical power supply:

(i) number, power, voltage, frequency and if applicable phase and location of the main power system (AC or DC) auxiliary power system location and external power system;

(ii) location of the controls, monitors and indicators in the cockpit;

(iii) main and back-up power sources flight instruments, communication and navigation systems, main and back-up power sources;

(iv) location of vital circuit breakers;

(v) generator operation and monitoring procedures of the electrical power supply.

(10) flight instruments, communication, radar and navigation equipment, autoflight and flight data recorders:

(i) antennas;

(ii) controls and instruments of the following equipment in the cockpit:
(A) flight instruments (for example air speed indicator, pitot static system, compass system, flight director);
(B) flight management systems;
(C) radar equipment, including radio;
(D) communication and navigation system (for example HF, VHF, ADF, VOR/DME, ILS, marker beacon) and area navigation systems;
(E) stabilization and autopilot system;
(F) flight data recorder, cockpit voice recorder, data-link communication recording function and radio altimeter;
(G) collision avoidance system;
(H) TAWS;
(I) HUMS;
(J) weather radar system, best practices for optimum use, interpretation of displayed information.

(11) cockpit, cabin and cargo compartment:

(i) operation of the exterior, cockpit, cabin and cargo compartment lighting and the emergency lighting;

(ii) operation of the cabin doors and emergency exits.

(12) emergency equipment:

(i) operation and correct application of the following mobile emergency equipment in the helicopter:
(A) portable fire extinguisher;
(B) first-aid kits;
(C) portable oxygen equipment;
(D) emergency ropes;
(E) life-jacket;
(F) life rafts;
(G) emergency transmitters;
(H) crash axes;
(I) megaphones;
(J) emergency signals;
(K) torches.

(ii) operation and correct application of the fixed emergency equipment in the helicopter: emergency floats.

(b) Limitations:

(1) general limitations, according to the helicopter flight manual;

(2) minimum equipment list.

(c) Performance, flight planning and monitoring:

(1) performance calculation about speeds, gradients, masses in all conditions for take-off, en-route, approach and landing:

(i) take-off:
(A) hover performance in and out of ground effect;
(B) all approved profiles, cat A and B;
(C) HV diagram;
(D) take-off and rejected take-off distance;
(E) take-off decision point (TDP) or (DPATO);
(F) calculation of first and second segment distances;
(G) climb performance.

(ii) en-route:
(A) air speed indicator correction;
(B) service ceiling;
(C) optimum or economic cruising altitude;
(D) max endurance;
(E) max range;
(F) cruise climb performance.

(iii) landing:
(A) hovering in and out of ground effect;
(B) landing distance;
(C) landing decision point (LDP) or (DPBL).

(iv) knowledge or calculation of: Vlo, Vle, Vmo, Vx, Vy, Vtoss, Vne, Vmax range, Vmini.

(2) flight planning for normal and abnormal conditions:

(i) optimum or maximum flight level;

(ii) minimum required flight altitude;

(iii) drift down procedure after an engine failure during cruise flight;

(iv) power setting of the engines during climb, cruise and holding under various circumstances as well as at the most economic cruising flight level;

(v) optimum and maximum flight level and power setting after an engine failure.

(3) effect of optional equipment on performance.

(d) Load, Balance and Servicing:

(1) load and balance:

(i) load and trim sheet on the maximum masses for take-off and landing;

(ii) center of gravity limits;

(iii) influence of the fuel consumption on the center of gravity;

(iv) lashing points, load clamping, max ground load.

(2) servicing on the ground, servicing connections for:

(i) fuel;

(ii) oil, etc.;

(iii) and safety regulations for servicing.

(e) Emergency procedures.

(f) Special requirements for helicopters with EFIS

(g) Optional equipment.

1.4.2 Helicopter Type Rating Technical Theoretical Knowledge Instruction Subjects (AMC2 FCL.930. TRI Part 2 (c))

(1) helicopter structure, transmissions, rotor and equipment, normal and abnormal operation of systems:

- (i) dimensions;
- (ii) engine including aux. power unit, rotors and transmissions;
- (iii) fuel system;
- (iv) air-conditioning;
- (v) ice protection, windshield wipers and rain repellent;
- (vi) hydraulic system;
- (vii) landing gear;
- (viii) flight controls, stability augmentation and autopilot systems;
- (ix) electrical power supply;
- (x) flight instruments, communication, radar and navigation equipment;
- (xi) cockpit, cabin and cargo compartment;
- (xii) emergency equipment.

(2) limitations:

- (i) general limitations, according to the helicopter flight manual;
- (ii) minimum equipment list.

(3) performance, flight planning and monitoring:

- (i) performance;
- (ii) light planning.

(4) load and balance and servicing:

- (i) load and balance;
- (ii) servicing on ground;

(5) emergency procedures;

(6) special requirements for helicopters with EFIS;

(7) optional equipment.

1.4.3 Helicopter Type Rating Instructor (TRI) Flight Instruction (AMC2 FCL.930.TRI Part 3)

FLIGHT INSTRUCTION SYLLABUS

(a) The amount of flight training will vary depending on the complexity of the helicopter type. At least 5 hours flight instruction for a SP helicopter and at least 10 hours for a MP ME helicopter should be counted. A similar number of hours should be used for the instruction and practice of pre-flight and post flight briefing for each exercise. The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently and related to the type of helicopter on which the applicant wishes to instruct.

(b) If a TRI(H) certificate for MP helicopters is sought, particular attention should be given to MCC.

(c) If a TRI(H) certificate for revalidation of instrument ratings is sought, then the applicant should hold a valid instrument rating.

FLIGHT OR FSTD TRAINING

(d) The training course should be related to the type of helicopter on which the applicant wishes to instruct.

(e) For MP helicopter type ratings MCC, CRM and the appropriate use of behavioral markers should be integrated throughout.

(f) The content of the training program should cover identified and significant exercises applicable to the helicopter type.

FSTD TRAINING

(g) The applicant for a TRI(H) certificate should be taught and made familiar with the device, its limitations, capabilities and safety features, and the instructor station.

(h) The applicant for a TRI(H) certificate should be taught and made familiar with giving instruction from the instructor station seat as well as the pilot's seats, including demonstrations of appropriate handling exercises.

(i) Training courses should be developed to give the applicant experience in training a variety of exercises, covering both normal and abnormal operations. The syllabus should be tailored appropriate to the helicopter type, using exercises considered more demanding for the student. This should include engine-out handling and engine-out operations in addition to representative exercises from the type transition course.

(j) The applicant should be required to plan, brief, train and debrief sessions using all relevant training techniques.

HELICOPTER TRAINING

(k) The applicant for a TRI(H) certificate should receive instruction (if applicable) in an FSTD to a satisfactory level in:

(1) left hand seat familiarization, and in addition right hand seat familiarization where instruction is to be given to co-pilots operating in the left-hand seat, which should include at least the following as pilot flying:

(i) pre-flight preparation and use of checklists;

(ii) taxiing: ground and air;

(iii) take-off and landings;

(iv) engine failure during take-off, before DPATO;

(v) engine failure during take-off, after DPATO;

(vi) engine inoperative approach and go-around;

(vii) one engine simulated inoperative landing;

(viii) autorotation to landing or power recovery;

(ix) other emergency and abnormal operating procedures (as necessary);

(x) instrument departure, approach and go-around with one engine simulated inoperative should be covered where TRI(H) privileges include giving instrument instruction for the extension of an IR(H) to additional types.

(2) helicopter training techniques:

(i) methods for giving appropriate commentary;

(ii) instructor demonstrations of critical manoeuvres with commentary;

(iii) particularities and safety considerations associated with handling the helicopter in critical manoeuvres such as one-engine-inoperative and autorotation exercises;

(iv) where relevant, the conduct of instrument training with particular emphasis on weather restrictions, dangers of icing and limitations on the conduct of critical manoeuvres in instrument meteorological conditions;

(v) intervention strategies developed from situations role-played by a TRI(H) course instructor, taken from but not limited to:

(A) incorrect helicopter configuration;

(B) over controlling;

(C) incorrect control inputs;

(D) excessive flare close to the ground;

(E) one-engine-inoperative take-off and landings;

(F) incorrect handling of autorotation;

(G) static or dynamic rollover on take-off or landing;

(H) too high on approach with associated danger of vortex ring or settling with power;

(I) incapacitation;

(L) abnormal and emergency procedures and appropriate methods and minimum altitudes for simulating failures in the helicopter;

(M) failure of the driving engine during OEI manoeuvres.

(l) Upon successful completion of the training above or if FSTD not applicable, the applicant should receive sufficient training in a helicopter in-flight under the supervision of a TRI(H) to a level where the applicant is able to conduct the critical items of the type rating course to a safe standard.

TRAINING WHERE NO FSTD EXISTS

(m) Where no FSTD exists for the type for which the TRI(H) certificate is sought, a similar course of training should be conducted in the applicable helicopter type. This includes all elements listed under sub paragraphs (k)(1) and (2) of this paragraph, the FSTD elements being replaced with appropriate exercises in a helicopter of the applicable type, subject to any restrictions placed on the conduct of critical exercises associated with helicopter flight manual limitations and safety considerations.

1.4.4 TRI Restricted Privileges (FCL.910.TRI, GM1 FCL.910.TRI)

(a) General. If the TRI training is carried out in FSTDs only, the privileges of TRIs shall be restricted to training in FSTDs. This restriction shall however include the following privileges for conducting, in the aircraft:

(1) LIFUS, provided that the TRI training course has included the training specified in point FCL.930.TRI(a)(4)(i);

(2) landing training, provided that the TRI training course has included the training specified in point FCL.930.TRI(a)(4)(ii); or

(3) the training flight specified in point FCL.060(c)(2), provided that the TRI training course has included the training referred to in points (a)(1) or (a)(2).

The restriction to FSTD shall be removed if TRIs have completed an assessment of competence in the aircraft. The privileges of TRIs shall be extended to further variants in accordance with the OSD if TRIs have completed the relevant parts of the technical training and flight instruction parts of the applicable TRI course.

(b) TRIs for helicopters — TRI(H).

(1) The privileges of TRIs(H) are restricted to the type of helicopter in which the assessment of competence for the issue of the TRI certificate was taken. Unless otherwise determined in the OSD, the privileges of the TRIs shall be extended to further types if TRIs have:

(i) completed the relevant parts of the technical training and flight instruction parts of the TRI course;

(ii) completed within the 12 months preceding the date of application, at least 10 hours on the applicable helicopter type, of which a maximum of 5 hours may be completed in an FFS or FTD 2/3; and

(iii) passed the relevant sections of the assessment of competence in accordance with point FCL.935 in order to demonstrate to an FIE or a TRE qualified in accordance with Subpart K of this Annex their ability to instruct a pilot to the level required for the issue of a type rating, including pre-flight, post-flight and theoretical knowledge instruction.

The privileges of TRIs shall be extended to further variants in accordance with the OSD if TRIs have completed the relevant parts of the technical training and flight instruction parts of the applicable TRI course.

(2) In order to extend the privileges of a TRI(H) to multi-pilot operations in the same type of single-pilot helicopters, the holder shall have at least 350 hours of flight time as a pilot in multi-pilot operations in any aircraft category or have at least 100 hours of flight time as a pilot in multi-pilot operations on the specific type within the last 2 years.

(3) Before the privileges of a TRI(H) are extended from single-pilot helicopters to multi-pilot helicopters, the holder shall comply with point FCL.915.TRI(d)(3).

(d) Notwithstanding the points above, holders of a TRI certificate who received a type rating in accordance with point FCL.725(e) shall be entitled to have their TRI privileges extended to that new type of aircraft.

1.4.5 Helicopter Type Rating Flight Instruction Subjects (AMC1 FCL.725(a))

1.4.5.1 Flight Maneuvers

- **a.** Level Flight
- **b.** Turns in Level Flight
- **c.** Climbing and Descending in Direction
- **d.** Climbing and Descending Turns
- **e.** Hovering
- **f.** Landing from Hovering
- **g.** Hovering Taxi
- **h.** Turns in Hovering
- **i.** Sideways Flying in Hovering
- **j.** Backward Flight in Hovering
- **k.** OGE Hover Checks
- **l.** Take-Off from Hovering
- **m.** Landing to Hovering
- **n.** Vertical Take-Off from Hovering
- **o.** Steep Approach to Hovering
- **p.** Aerodrome Circuit
- **q.** Take-Off from Ground
- **r.** Landing to Ground
- **s.** Decreasing and Increasing Speed
- **t.** Sudden Stop
- **u.** Reconnaissance
- **v.** Confined Area Procedures
- **w.** Hill Ridge Operation
- **x.** Slope Operation
- **y.** Vertical Take-Off and Landing in Slope
- **z.** Demonstration of Vh and Vne Speed
- **aa.** Steep Turns
- **bb.** Fuel Flow Control
- **cc.** FMS and Autopilot Usage
- **dd.** CAT-A Maneuvers

1.4.5.2 Emergency Flight Maneuvers

- **a.** Warning and Cautions
- **b.** Engine Failures
  1) Autorotative Landing
  2) Engine in-Flight Restart
  3) Fuel Control System Malfunction
  4) Electronic Engine Control System Malfunction
  5) High Temperature Operation
  6) Engine Oil pressure Failure
  7) Engine Compressor Failure
- **c.** Electrical Failures
- **d.** Transmission, M/R and T/R malfunctions
- **e.** Hydraulic System Malfunctions
- **f.** Fire (on the ground or in flight)
- **g.** Smoke in the cabin, Toxic Fumes
- **h.** Static Port Failure
- **i.** Lightning Strike in Flight
- **j.** Autopilot and Avionics System Failures
- **k.** Other Optional System Failures
- **l.** Fly-Away Maneuver
- **m.** CAT-A engine Failures

1.4.5.3 Instrument Flight Maneuvers

- **a.** IFR Take-Off
  - Simulated engine failure on take off
- **b.** Radio Navigation
- **c.** Holding
- **d.** Precision Approach Procedures
  - Manuel (Without Flight Director)
- **e.** Non-Precision Approach Procedures
- **f.** Two-Sided Radio Failure Procedures
- **g.** IFR flight maneuvers
- **h.** Go-around Procedures with all engines operating on DA/DH or MDA/MDH
  - Go-around Procedures on simulated single engine failure in DA/DH or MDA/MDH procedures
- **i.** Autorotation in IFR conditions
- **j.** FD and FMS Procedures

1.4.6 Helicopter Type Rating Examiner Standardization Theoretical Knowledge Lessons (AMC1 FCL.1015)

The training should comprise:

(1) Theoretical training covering at least:

(i) the contents of AMC2 FCL.1015 and the FEM;

(ii) Part-FCL and related AMCs and GM relevant to their duties;

(iii) operational requirements and related AMCs and GM relevant to their duties;

(iv) national requirements relevant to their examination duties;

(v) fundamentals of human performance and limitations relevant to flight examination;

(vi) fundamentals of evaluation relevant to applicant’s performance;

(vii) the management system of ATOs and the organisational structure of DTOs;

(viii) MCC, human performance and limitations, if applicable.

(2) Examiners should also be briefed on the protection requirements for personal data, liability, accident insurance and fees, as applicable in the member state concerned.

(3) All items above are the core knowledge requirements for an examiner and are recommended as the core course material. This core course may be studied before recommended examiner training is commenced. The core course may utilize any suitable training format.

1.4.7 Helicopter Type Rating Examiner Standardization Practical Training Subjects (AMC1 FCL.1015)

Practical training consisting of at least:

(i) knowledge and management of the test for which the certificate is to be sought. These are described in the relevant modules in the FEM;

(ii) knowledge of the administrative procedures pertaining to that test or check.

For an initial examiner certificate, practical training should include the examination of the test profile sought, consisting of the conduct of at least two test or check profiles in the role of examiner (these two tests or checks profiles can be performed in the same simulator session), including briefing, conduct of the skill test and proficiency check, assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner of the appropriate category on the applicable type. This training is conducted in the aircraft if approval for testing or checking in the aircraft is required. If examiner privileges in FSTD’s are required, practical instruction in the use of FSTD(s) for testing or checking should also be completed.

If examiner privileges are to include the conduct of proficiency checks for the revalidation or renewal of an instrument rating, practical instruction should include the conduct of at least four instrument check profiles in the role of examiner, including briefing, conduct of the skill test and proficiency check, assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner of the appropriate category on the applicable type. This training is conducted in the aircraft if approval for testing or checking in the aircraft is required. If examiner privileges in both FSTD and aircraft are required, at least one of the instrument check profiles should be conducted in an FSTD.

For extension of an examiner certificate to further types (as required for TRE), further practical training on the new type may be required, consisting of the conduct of at least one test or check profile in the role of examiner on the new type, including briefing, conduct of the skill test and proficiency check, assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner of the appropriate category on the applicable type. A further examiner check on the new type may be required, which may be supervised by an inspector of the Turkish DGCA or a suitably authorised senior examiner.

1.5 SCHEDULE (DAILY, WEEKLY) (SHT-FTL/HG)

1.5.1 Timeline

1 hour	60 minutes
1 day	8 hours
1 week	5 working days
1 month	4 weeks (20 working days)
1 year	52 weeks (260 working days)

1.5.2 Lesson Schedule for a Standard Day

TIME	ACTIVITY
01.00	1. LESSON
00.15	REST
01.00	2. LESSON
00.15	REST
01.00	3. LESSON
01.00	REST (LUNCH TIME)
01.00	4. LESSON
00.15	REST
01.00	5. LESSON
00.15	REST
01.00	6. LESSON

1.5.3 Application of Flight Schedule for a Standard Day

DAILY ACTIVITY	TIME
PRE-FLIGHT BRIEFING	01.00
PRE-FLIGHT CHECKS	00.45
FLIGHT	01.30
LUNCH	01.00
PRE-FLIGHT BRIEFING	01.00
PRE-FLIGHT CHECKS	00.45
FLIGHT	01.30
POST FLIGHT BRIEFING	00.30

1.6 TRAINING PROGRAM

1.6.1 Organizing Daily and Weekly Programs for Flight and Theoretical Knowledge Training

a. Flight and theoretical trainings are carried out in coordination, as shown in the Type Rating Training Programs.

b. In the course training programs, primarily the Theoretical Knowledge curriculum is given. After the theoretical knowledge course training, flight training begins. Flight training is done as two sorties a day, in the morning and in the afternoon. Theoretical knowledge course trainings are held at KAAN AIR facilities. Flight trainings are performed in centers requested depending on meteorological conditions and/or in SHGM / EASA approved Full Flight Simulators (FFS) in line with SHT-1S regulation. Accordingly, half-day flight training and half-day Theoretical Knowledge course are given.

c. Briefings before and after the flight are considered theoretical knowledge training.

d. Depending on the candidate's situation and experience, flight and theoretical knowledge training periods **can be increased** :

- Compensation / additional programs may be prepared for trainees who cannot attend theoretical courses for various reasons, and they will be enabled to take all courses,
- In accordance with the training programs specified in 1.6.1.1, revisions to be made, when necessary, for the plans including daily theoretical and flight training periods and the knowledge of the instructors to perform them will be prepared by the relevant Type Rating Instructor and approved by the KAAN ATO Head of Training.

1.6.1.1 Helicopter Type Rating Course Training Periods

1.6.1.1.1 Helicopter Initial Type Rating Course Training Periods

(AMC2 FCL.725 (a) – (c) Initial Issue, (e) Holders of IR(H))

Unless otherwise stated in the operational compliance data generated in accordance with SHT-21, the following deadlines shall apply to applicants applying for a helicopter type rating for the first time to types from SET(H) or SPH MET(H) classes:

HELICOPTER CLASS	TYPES	THEORETICAL KNOWLEDGE TRAINING PERIOD (Hrs)	THEORETICAL KNOWLEDGE EXAM DURATION (Hrs)	FLIGHT TRAINING TIME (VFR) (Hrs)	ADDITIONAL INSTRUMENT FLIGHT TRAINING TIME (IFR) (Hrs)	FLIGHT CHECK TIME (Hrs)	TOTAL FLIGHT TIME (Hrs)
Single Engine Turbine Helicopter MTOM<3175 SET(H)	A119	28:30	01:30	05:00	N/A	01:00	06:00
Single Pilot Multi Engine Turbine Helicopter SPH MET(H)	AW109 E	28:42	01:18	08:00 only H Or 08:00 FFS 02:00 H	06:00 only H Or 08:00 FFS 02:00 H	VFR (V) 01:00 CPL/IR (C) 01:30 ATPL (AT) 02:00 (In FFS or H)	V 09:00 H V 11:00 F C 15:30 H C 21:30 F AT 16:00 H AT 22:00 F
	AW109 S						
	AW109 SP	46:30	01:30	08:00 only H Or 08:00 FFS 04:00 H (H may be after check in FFS)			V 09:00 H V 13:00 F C 15:30 H C 23:30 F AT 16:00 H AT 24:00 F
	AW139	58:30		08:00 only H Or 12:00 FFS 02:00 H (H may be after check in FFS)			V 09:00 H V 15:00 F C 15:30 H C 25:30 F AT 16:00 H AT 26:00 F

***NOTE 1:** The above flight hours are minimum and can be increased according to the candidate's situation and experience.*

1.6.1.1.2 Helicopter Additional Type Rating, Difference and Additional Instrument Course Programs (AMC2 FCL.725 (a) – (d) Additional Types, (e) Holders of IR(H))

The following time of training will apply to applicants who apply for the issue of another type rating of the same class, among pilots with an appropriate type rating in SET(H) or SPH MET(H):

<table>
<tr><th>HELICOPTER CLASS</th><th>TYPES</th><th>THEORETICAL KNOWLEDGE TRAINING PERIOD (Hrs)</th><th>THEORETICAL KNOWLEDGE EXAM DURATION (Hrs)</th><th>FLIGHT TRAINING TIME (VFR) (Hrs)</th><th>ADDITIONAL INSTRUMENT FLIGHT TRAINING TIME (IFR) (Hrs)</th><th>FLIGHT CHECK TIME (Hrs)</th><th>TOTAL FLIGHT TIME (Hrs)</th></tr>
<tr><td>SET(H) to SET(H)</td><td>A119</td><td>28:30</td><td>01:30</td><td>03:00</td><td>N/A</td><td>01:00</td><td>04:00</td></tr>
<tr><td rowspan="5">SPH MET(H) to MET(H)</td><td>AW109 E</td><td rowspan="2">28:42</td><td rowspan="2">01:18</td><td rowspan="2">04:00 only H
Or
04:00 FFS
02:00 H</td><td rowspan="2">03:00 only H
Or
04:00 FFS
02:00 H</td><td rowspan="4">VFR
(V)
01:00
CPL/IR
(C)
01:30
ATPL
(AT)
02:00
(In FFS or H)</td><td rowspan="2">V 05:00 H
V 07:00 F
C 08:30 H
C 13:30 F
AT 09:00 H
AT 14:00 F</td></tr>
<tr><td>AW109 S</td></tr>
<tr><td>AW109 SP</td><td>46:30</td><td rowspan="3">01:30</td><td>06:00 only H
Or
06:00 FFS
04:00 H
(H may be after check in FFS)</td><td>04:00 only H
Or
04:00 FFS
02:00 H</td><td>V 07:00 H
V 11:00 F
C 11:30 H
C 17:30 F
AT 12:00 H
AT 18:00 F</td></tr>
<tr><td>AW139</td><td>58:30</td><td>05:00 only H
Or
08:00 FFS
02:00 H
(H may be after check in FFS)</td><td>04:00 only H
Or
06:00 FFS</td><td>V 06:00 H
V 11:00 F
C 10:30 H
C 17:30 F
AT 11:00 H
AT 18:00 F</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

<table>
<tr><th>HELICOPTER CLASS</th><th>TYPES</th><th>THEORETICAL KNOWLEDGE TRAINING PERIOD (Hrs)</th><th>THEORETICAL KNOWLEDGE EXAM DURATION (Hrs)</th><th>FLIGHT TRAINING TIME (VFR) (Hrs)</th><th>ADDITIONAL INSTRUMENT FLIGHT TRAINING TIME (IFR) (Hrs)</th><th>FLIGHT CHECK TIME (Hrs)</th><th>TOTAL FLIGHT TIME (Hrs)</th></tr>
<tr><td rowspan="4">SPH(H) Single Engine Difference Training
(FCL.710 (b),
GM1 FCL.710)
(Note-2)</td><td>A119
Among variants
A119 / A119 IDS series
to
AW119 MKII (Ke)</td><td>N/A</td><td rowspan="4">N/A</td><td>01:00 H</td><td rowspan="4">N/A</td><td rowspan="4">(Not Required,
Records are processed and signed in Logbook by TRI(H);
FCL.710 (c))</td><td>01:00 H</td></tr>
<tr><td>A119 /A119 IDS series
to
AW119 MKII G1000H (Kx)</td><td rowspan="2">12:00</td><td rowspan="2">02:00 H</td><td rowspan="2">02:00 H</td></tr>
<tr><td>AW119 MKII (Ke)
to
AW119 MKII G1000H (Kx)</td></tr>
<tr><td>AW119 MKII G1000H
to
AW 119 MKII G1000H NXI (Kx)</td><td>04:00</td><td>N/A</td><td>N/A</td></tr>
</table>

<table>
<tr><th>HELICOPTER CLASS</th><th>TYPES</th><th>THEORETICAL KNOWLEDGE TRAINING PERIOD (Hrs)</th><th>THEORETICAL KNOWLEDGE EXAM DURATION (Hrs)</th><th>FLIGHT TRAINING TIME (VFR) (Hrs)</th><th>ADDITIONAL INSTRUMENT FLIGHT TRAINING TIME (IFR) (Hrs)</th><th>FLIGHT CHECK TIME (Hrs)</th><th>TOTAL FLIGHT TIME (Hrs)</th></tr>
<tr><td rowspan="9">MET(H) Multi Engine Difference Training
(FCL.710 (b),
GM1 FCL.710)
(Note-2)</td><td>AW109
Among variants
(E -> S)</td><td>09:00</td><td rowspan="6">N/A
(Note-3)</td><td>02:00 H</td><td>01:00 H</td><td rowspan="9">(Not Required,
Records are processed and signed in Logbook by TRI(H);
FCL.710 (c))</td><td>03:00</td></tr>
<tr><td>(E -> SP)</td><td>30:00</td><td>04:00 only H
Or
02:00 FFS
02:00 H</td><td>04:00 H
Or
04:00 FFS</td><td>08:00</td></tr>
<tr><td>(S -> E)</td><td>09:00</td><td>02:00 H
Or
02:00 FFS</td><td>02:00 H
Or
02:00 FFS</td><td>04:00</td></tr>
<tr><td>(S -> SP)</td><td>27:00</td><td>02:00 only H
Or
02:00 FFS
01:00 H</td><td>04:00 H
Or
04:00 FFS</td><td>06:00 only H
Or
06:00 FFS
01:00 H</td></tr>
<tr><td>(SP -> E)</td><td>15:00</td><td>02:00 H
Or
02:00 FFS</td><td>02:00 H
Or
02:00 FFS</td><td>04:00</td></tr>
<tr><td>(SP -> S)</td><td>12:00</td><td>02:00 H</td><td>02:00 H</td><td>04:00</td></tr>
<tr><td>AW-139
EPIC Phase
(Note-4)
(4 -> 5)</td><td colspan="2" rowspan="2">Self-Instruction
(Note-3)</td><td rowspan="2">N/A</td><td rowspan="3">N/A</td><td rowspan="2">N/A</td></tr>
<tr><td>(5 -> 7)</td></tr>
<tr><td>(7 -> 8)</td><td colspan="2">Total Aided Training:
• Base Improvement: 04:00 Hrs
• Optional Improvement: 02:00 Hrs
(Note-3)</td><td>01:00</td><td>01:00</td></tr>
</table>

IR Rating Conversion to → **MET(H) IR** (AMC2 FCL.725 (a) / (e))	AW109 AW139	10.00 Hours	N/A	**SET(H) IR** **to** **MET(H) IR**	05.00 Hours (SIM or Helicopter)	01:00 IR *(When LPC / OPC is wanted to be performed,* *VFR+IFR is performed as 01:30 in total)*	06.00 Hours
		05.00 Hours		**MET(H) IR** **to** **MET(H) IR**	02.00 Hours (SIM or Helicopter)		03.00 Hours

NOTE-1: *The above flight hours are minimum and can be increased according to the candidate's situation and experience.*

NOTE-2: *In accordance with FCL.710(b); If a variant has not been flown for 2 years following difference training, additional difference training or proficiency check is required in the relevant variant in order to maintain privileges.*

NOTE-3: *GROUND TRAINING approach at DIFFERENCE TRAINING:*

When the training difference required is limited to theoretical instructions, the applicable methods to comply with will be:

a. Self-instruction

Type related OSD provides the list of the items that are necessary to be known to be able to fly safely all the upgraded aircraft, and the trainee is responsible himself for his proficiency in the subject.

b. Aided instruction

Type related OSD provides the list of the items that are necessary to be known to be able to fly safely all the upgraded aircraft that will be made available in a lecture provided by a qualified instructor in KAAN ATO; alternative means of compliance are:

- *Distance Learning*

  The distance Learning concept allows additional value and progressive helicopter discovery and the main technical and operational concept which describe its design. KAAN ATO will design its Distance Learning modules focusing on general presentation of helicopter and systems, as well as on specific items with a specific purpose. The intended benefit is to allow self-training during this phase, and the advantage given by Distance learning is the possibility to self-evaluate the learning outcome.

- *Computer Based Training (CBT)*

  On-site and Deployable CBT are a pedagogical approach that aims at putting the trainee in situation to interact with the helicopter system. Based on an avionic emulator that can be very realistic and include basic flight loop, CBT will guide the trainee from discovering aviation design to using basic and complex function and modes to become familiar to their use. CBT can be also a way to consider knowledge prior to practical training and thus allows better effectives of flight and simulator training time; even with CBT, one advantage is the possibility to self-evaluate the learning outcome.

NOTE-3b: *MASTER DIFFERENCE TRAINING (MDR) for A119 family:*

MDR tables for the A119 family will be carried out in accordance to Difference Level Table.

A119 MDR Table

A119		FROM Helicopter			
		A119	A119 IDS	A119 MkII (Ke)	A119 MkII G1000H (Kx)
TO Helicopter	A119	-	C/A/A	D/A/A	D/A/C
	A119 IDS	C/A/A (1)	-		D/A/C
	A119 MkII (Ke)	D/A/C (1)(2)	D/A/A	-	C/B/B
	A119 MkII G1000H (Kx) (4)	D/A/C (1)(2)(3)	D/A/C	C/B/B	-

SubNotes:

(1) Installation of 2 EDUs
(2) Installation of new Main Rotor blades
(3) Installation of Garmin G1000H
(4) See Chapter 4.1.1 of "A119 - AW119MKII - OSD CONSTITUENT FLIGHT CREW DATA".

The Operational group has evaluated the A119, A119 IDS, AW119MKII (Ke), AW119MKII G1000H (Kx), and recommends to classify:

- *AW119MKII as a variant of the A119 and not as a different type, the different training will be minimum 3 autorotation to be performed on the real aircraft.*
- *A119 IDS as an evolution of A119 and recommends a familiarization training with A119 IDS.*
- *AW119MKII G1000H as an avionic evolution of AW119MKII and recommends a ground training of minimum 12 hours including aircraft familiarization of minimum 2 Hours.*

NOTE-4: *MASTER DIFFERENCE TRAINING (MDR) for AW139:*

The MDR are developed for pilots upgrading from a specific EPIC software phase to the following ones available, as well as for pilots rated on a specific EPIC software phase who are requested to fly on AW139 helicopter with a previous EPIC software phase installed. The training needs are the sum of training between the software phases; so then, as an example, the training needs from the base aircraft to the software phase 7 is the sum of training from the base aircraft to the software phase 5 and, the training needs from the software phase 5 to the software phase 7.

AW139 MDR Table

AW139		FROM HELO			
		EPIC phase 4	EPIC phase 5	EPIC phase 7	EPIC phase 8
TO HELO	EPIC phase 4	-	A/-/-	-	-
	EPIC phase 5	A/-/-	-	A/-/-	-
	EPIC phase 7	-	A/-/-	-	A/-/-
	EPIC phase 8	-	-	C/A/-	

Easy Access Rules for Operational Suitability Data (OSD) Flight Crew Data (CS-FCD) for letter codes:

CS.FD.415 (a)

DIFFERENCE LEVEL	TRAINING /	/ CHECKING /	/ CURRENCY
A	Self-instruction	Not applicable or integrated with the next proficiency check	Not applicable
B	Aided instruction	Task or system check	Self-review
C	System devices	Partial proficiency check that uses a qualified device	Designated systems and procedures that use system devices or aircraft
D	FSTDs(1) or aircraft to execute specific manoeuvres	Partial proficiency check that uses a qualified device(1)	Designated manoeuvre(s) that use FSTDs(1) or aircraft
E	FSTDs(2) or aircraft	Proficiency check using FSTDs(3) or aircraft	

Footnote 1:

(1) reserved

(2) helicopters:

(i) FTD Levels 2 and 3, or

(ii) FFS.

Footnote 2:

(1) reserved

(2) helicopters:

FSTDs that have dual qualification:

FFS Level B and FTD Level 3, or

FFS Level C or D.

Footnote 3:

(1) reserved

(2) helicopters:

(i) FTD Levels 2 and 3, or

(ii) FFS.

1.6.1.2 Extension, Renewal, Revalidate and Operational Proficiency Checks of Type Rating

(a) Revalidation. For revalidation of type ratings for helicopters, the applicant shall:

(1a) do minimum 1-hour Recurrent Flight Training as PF with Helicopter or FSTD (For AW139 with the same or upper EPIC software phase in flown helicopters EPIC phase).

(1b) pass a proficiency check in accordance with SHT-FCL Appendix 1.9 to this Part in the relevant type of helicopter or an FSTD representing that type within the 3 months immediately preceding the expiry date of the rating; and

(2) complete at least 2 hours as a pilot of the relevant helicopter type within the validity period of the rating.

The duration of the proficiency check may be counted towards the 2 hours.

(3) When applicants hold more than 1 type rating for single-engine piston helicopters, they may achieve revalidation of all the relevant type ratings by completing the proficiency check in only 1 of the relevant types held, provided that they have completed at least 2 hours of flight time as PIC on the other types during the validity period.

The proficiency check shall be performed each time on a different type.

(4) When applicants hold more than 1 type rating for single-engine turbine helicopters with a maximum certificated take-off mass up to 3175 kg, they may achieve revalidation of all the relevant type ratings by completing the proficiency check in only 1 of the relevant types held, provided that they have completed:

(i) 300 hours as PIC on helicopters;

(ii) 15 hours on each of the types held; and

(iii) at least 2 hours of PIC flight time on each of the other types during the validity period.

The proficiency check shall be performed each time on a different type.

(5) A pilot who successfully completes a skill test for the issue of an additional type rating shall achieve revalidation for the relevant type ratings in the common groups, in accordance with (3) and (4).

(6) The revalidation of an IR(H), if held, may be combined with a proficiency check for a type rating.

(b) An applicant who fails to achieve a pass in all sections of a proficiency check before the expiry date of a type rating shall not exercise the privileges of that rating until a pass in the proficiency check has been achieved. In the case of (a)(3) and (4), the applicant shall not exercise his/her privileges in any of the types.

(c) Renewal Of Type Ratings: Refresher Training at an ATO or an Instructor

(a) The objective of the refresher training is for the applicant to reach the level of proficiency necessary to safely operate the relevant type or class of aircraft. The amount of refresher training needed should be determined on a case-by-case basis by the ATO or the instructor, as applicable, taking into account the following factors: (APP-6 REFRESHMENT TRAINING EVALUATION FORM)

(1) the experience of the applicant;

(2) the amount of time elapsed since the privileges of the rating were last used;

(3) the complexity of the aircraft;

(4) whether the applicant has a current rating on another aircraft type or class; and

(5) where considered necessary, the performance of the applicant during a simulated proficiency check for the rating in an FSTD or an aircraft of the relevant type or class.

It should be expected that the amount of training needed to reach the desired level of proficiency will increase analogously to the time elapsed since the privileges of the rating were last used.

(b) After having determined the needs of the applicant, the ATO, or the instructor, as applicable, should develop an individual training program based on the initial training for the rating, focusing on the aspects where the applicant has shown the greatest needs.

(c) With the exception of refresher training for ratings for aircraft referred to in point FCL.740(b)(2)(i), refresher training should include theoretical knowledge instruction, as necessary, such as for type-specific system failures in complex aircraft. The performance of the applicant should be reviewed during the training and additional instruction should be provided to the applicant, where necessary, to reach the standard required for the proficiency check.

In case KAAN ATO is requested to do Theoretical Knowledge Renewal Training, KAAN ATO will take place this training and exam:

- On their own, or
- It provides a **Distance Learning module and exam** prepared by an approved TR / EASA ATO or Training Center.

In Both cases, upon successful completion of the training, it retains the certificate of completion in its own records. The program of the relevant approved TR / EASA ATO or Training Center is applied **under the control of KAAN ATO** and in below conditions:

- It can be performed Theoretical Ground training that does not include practical elements,
- Participant feedback regarding the distance/virtual classroom training system is recorded after each training, and system improvements and training content updates are made accordingly,
- In order to achieve the planned training objectives, a Risk Assessment will be made by taking into account the following points as a minimum :
  - Candidates and Instructors have access to appropriate equipment to support their transition from distance learning or face-to-face training to virtual classroom training,
  - Teaching method,
  - Distance / virtual education environment,
  - Within the scope of internal audits, distance/virtual training subjects and contents are also audited,

(d) After successful completion of the training, the ATO, or the instructor, as applicable, should issue the applicant with a training completion certificate or another document specified by the competent authority, describing the evaluation of the factors listed in (a), the training received, and a statement that the training has been successfully completed. The training completion certificate should be presented to the examiner prior to the proficiency check. Following the successful renewal of the rating, the training completion certificate or the other document specified by the competent authority and the examiner report form should be submitted to the competent authority.

(e) Taking into account the factors listed in (a) above, the ATO, or the instructor, as applicable, may also decide that the applicant already possesses the required level of proficiency, and that no refresher training is necessary. In such a case, the certificate or other documental evidence referred to in (c) above should contain a respective statement including sufficient reasoning.

(d) Renewal Trainings :

<table>
<tr><th colspan="2">RENEWAL TRAINING AND CHECKS</th><th>TRAINING DURATIONS (Hours)</th><th>CHECK AND EXAM DURATION (Hours)</th><th>VALIDITY PERIODS</th><th>BY WHOM THE TRAINING AND CONTROLS WILL BE DONE</th></tr>
<tr><td rowspan="2">THEORETICAL KNOWLEDGE RENEWAL TRAINING
(Note 1)</td><td>SEH</td><td rowspan="2">05:00</td><td rowspan="2">01:00</td><td rowspan="2">12 Months</td><td rowspan="2">TRI or TKI</td></tr>
<tr><td>MEH</td></tr>
<tr><td rowspan="2">LICENSE PROFICENCY CHECK (LPC)</td><td>SEH</td><td rowspan="2">02:00
(01:00 VFR
01:00 IFR)</td><td rowspan="3">VFR – 01:00
CPL/IR – 01:30
ATPL – 02:00</td><td rowspan="2">12 Months</td><td rowspan="2">TRE</td></tr>
<tr><td>MEH</td></tr>
<tr><td colspan="2">OPERATOR PROFICIENCY CHECK (OPC)</td><td>n/a</td><td>6 Months</td><td>TRE</td></tr>
<tr><td colspan="2">TYPE RATING INSTRUCTOR (TRI) PRIVELEGE RENEWAL</td><td>Must also meet the conditions stated in FCL.900 FCL.915 FCL.905.TRI FCL.915.TRI FCL.940.TRI</td><td>Helicopter: 01:00
SIM: 03:00</td><td>3 Years</td><td>TRI, TRE</td></tr>
</table>

Note 1 : *Flight Renewal Training and Theoretical Knowledge Renewal Trainings of the candidate applying to KAAN ATO for license renewal training are also held within the ATO. However; if the flight operation organization where the candidate is working has included the Theoretical Knowledge Renewal Trainings in its own operation manual and has it approved by the DGCA; If it certifies that these trainings have been carried out within 3 months before the license expiry date, only Flight Renewal Proficiency Check Flight is made at the ATO. (***FCL.625, FCL.740, FCL.740.H, FCL.940.FI ,FCL.940.TRI***)*

Note 2 : *The above flight hours are minimum and can be increased according to the candidate's situation and experience.*

1.6.1.3 Helicopter Type Rating Instructor (TRI) Course

General Principles Regarding the Structure of the Course:

- **a.** Helicopter Type Rating Instructor course is one of the sub-courses that KAAN APPROVED TRAINING ORGANIZATION is authorized to give.
- **b.** The principles specified in the KAAN AIR ATO Operation Manual also cover the operating requirements of the Helicopter Type Rating Instructor course.
- **c.** All the principles stated in the KAAN AIR ATO Operation Manual are also valid for the Helicopter Type Rating Instructor course.
- **d.** In this section, only the principles and training programs specific to the Helicopter Type Rating Instructor Course are stated.

The Aim of the Course

The purpose of the helicopter type rating teaching course; is to train helicopter license holders at a level that can provide helicopter type rating training. Candidates for this:

- **a.** To update and refresh technical knowledge,
- **b.** To enable them to come to a level that can teach theoretical lessons and flight maneuvers,
- **c.** To raise their flying skills to the next level,
- **d.** To enable them to gain high flight safety awareness.

General prerequisites and requirements for Instructors (FCL.900, FCL.915)

(a) General.

Applicants for the issue of an instructor certificate:

- shall be at least 18 years of age.
- hold a CPL, MPL or ATPL pilot license on the applicable aircraft category.
- must have a valid medical report
- must have the type and instrument rating in related type.
- have received at least 10 hours of instrument flight instruction on the appropriate aircraft category, of which not more than 5 hours may be instrument ground time in an FSTD.
- have completed 20 hours of VFR cross-country flight on the appropriate aircraft category as PIC.

(b) Additional requirements for instructors providing flight instruction in aircraft.

Applicants for the issue of or holders of an instructor certificate with privileges to conduct flight instruction in an aircraft shall:

(1) for license training, hold at least the license or, in the case of point FCL.900(c), the equivalent license, for which flight instruction is to be given.

(2) for a rating training, hold the relevant rating or, in the case of point FCL.900(c), the equivalent rating, for which flight instruction is to be given.

(3) except in the case of flight test instructors (FTIs), have:

(i) completed at least 15 hours of flight time as pilots of the class or type of aircraft on which flight instruction is to be given, of which a maximum of 7 hours may be in an FSTD representing the class or type of aircraft, if applicable; or

(ii) passed an assessment of competence for the relevant category of instructor on that class or type of aircraft; and

(4) be entitled to act as PIC in the aircraft during such flight instruction.

For TRI(H):

(1) for a TRI(H) certificate for single-pilot single-engine helicopters, have completed 250 hours as a pilot on helicopters.

(2) for a TRI(H) certificate for single-pilot multi-engine helicopters, have completed 500 hours as pilot of helicopters, including 100 hours as PIC on single-pilot multi-engine helicopters.

(3) for a TRI(H) certificate for multi-pilot helicopters, have completed 1 000 hours of flight time as a pilot on helicopters, including:

(i) 350 hours as a pilot on multi-pilot helicopters; or

(ii) for applicants already holding a TRI(H) certificate for single-pilot multi-engine helicopters, 100 hours as pilot of that type in multi-pilot operations.

(4) Holders of an FI(H) certificate shall be fully credited towards the requirements of (1) and (2) in the relevant single pilot helicopter.

Crediting Experiences Gained (FCL.915)

(a) Credit towards further instructor certificates and for the purpose of revalidation:

(1) Full credit towards the teaching and learning skills may be granted to:

(i) holders of an instructor certificate who apply for further instructor certificates; and

(ii) applicants for an instructor certificate who already hold an instructor certificate issued in accordance with Annex III (Part-BFCL) to Commission Regulation (EU) 2018/395 or with Annex III (Part-SFCL) to Commission Implementing Regulation (EU) 2018/1976.

(2) Hours flown as an examiner during skill tests or proficiency checks shall be credited in full towards revalidation requirements for all instructor certificates held.

(b) Credit for extension to further types shall take into account the relevant elements as defined in the operational suitability data established in accordance with Annex I (Part-21) to Regulation (EU) No 748/2012 (OSD).

Training Principles

General

(a) Course is based on sufficient knowledge on theoretical subjects and rather on teaching techniques.

(b) Due to the importance of the human factor, emphasis is placed on the individual role; Special attention is paid to candidates in maturity and judgment.

(c) The main goal of the course; To refresh and update the technical knowledge of the trainees, to teach the theoretical and flight training subjects and to enable them to gain high safety awareness.

(d) The performance of the students in the course will be followed by the type rating teacher.

(e) During the course, issues related to flight safety will be especially emphasized, and issues aimed at increasing the technical knowledge and flight skills of the trainees will be emphasized.

(f) Helicopter Type Rating Teaching Course has three sections: Teaching and Learning, Technical Training and Flight Training.

(g) The Teaching and Learning portion of the course (AMC2 FCL.930.TRI) is theoretical and consists of 25 lecture hours.

(h) Lessons on Teaching and Learning are given by the Helicopter Type Rating Instructor (TRI/H).

(i) The Technical Training covers the ground lesson topics related to the helicopter to be trained (AMC2 FCL.930.TRI) and consists of 10 lesson hours.

(j) Technical Training is given by the theoretical knowledge instructor.

(k) Flight training covers the flight movements specified in the helicopter type rating skill test forms (SHT-FCL Annex 1.9 C)

(l) Flight training is given by the Helicopter Type Rating Instructor (TRI/H).

(m) Flight training time varies depending on the complexity of the helicopter's structure.

(n) Candidates holding a helicopter flight instructor (FI/H) certificate, or a Type Rating Instructor (TRI/H) certificate will be exempted from the subjects in the first part of the course (Teaching and Learning).

Helicopter Type Rating Instructor Course Training Periods by Helicopter Class

<table>
<tr><th rowspan="2">HELICOPTER CLASS</th><th colspan="2">PART 1 (**)
TEACHING AND LEARNING

(FCL.930.TRI,
AMC2 FCL.930.TRI)

(Hours)</th><th colspan="2">PART 2
THEORETICAL TRAINING

(FCL.930.TRI,
AMC2 FCL.930.TRI)

(Hours)</th><th colspan="3">PART 3
FLIGHT TRAINING

(FCL.930.TRI,
AMC2 FCL.930.TRI,
GM1 FCL.910.TRI (b)(2))
(Hours)</th></tr>
<tr><th>THEORETICAL KNOWLEDGE TRAINING</th><th>EXAM</th><th>THEORETICAL KNOWLEDGE TRAINING</th><th>EXAM</th><th>FLIGHT TRAINING</th><th>ASSESSMENT OF COMPETENCE
(FCL.935, FCL.935.TRI)</th><th>TOTAL FLIGHT TIME</th></tr>
<tr><td rowspan="2"><u>SINGLE</u>
PILOT
HELICOPTER

(FCL.930.TRI)</td><td rowspan="5">25:00</td><td rowspan="5">02:00</td><td rowspan="5">10:00</td><td rowspan="5">01:00</td><td>(*)
05:00
HLCP</td><td>01:00
HLCP</td><td>06:00
HLCP</td></tr>
<tr><td>04:00
SIM
+
01:00
HLCP</td><td>01:00
HLCP</td><td>04:00
SIM
+
02:00
HLCP</td></tr>
<tr><td rowspan="3"><u>MULTI</u>
PILOT
HELICOPTER

(FCL.930.TRI)</td><td>(*)
10:00
HLCP</td><td>01:00
HLCP</td><td>11:00
HLCP</td></tr>
<tr><td>04:00
SIM
+
06:00
HLCP</td><td>01:00
HLCP</td><td>04:00
SIM
+
07:00
HLCP</td></tr>
<tr><td>10:00
SIM</td><td>02:00
SIM
+
02:00
HLCP</td><td>12:00
SIM
+
02:00
HLCP</td></tr>
</table>

NOTE: *The above flight hours are minimum and can be increased according to the candidate's situation and experience.*

* The TRI training course shall be conducted in the aircraft only if no FSTD is available.

** Applicants holding or having held an instructor certificate shall be fully credited towards the requirement of Part 1.

*** An applicant for a TRI certificate who holds an SFI certificate for the relevant type shall be fully credited towards the requirements of this paragraph for the issue of a TRI certificate restricted to flight instruction in simulators.

Principles Regarding Exams and Checks

a. The exam related to the Teaching and Learning part of the course is given by an examiner (examiner) authorized by the DGCA or a Type Rating Instructor (TRI/H). The exam consists of 25 multiple choice and minimum 3 choice questions. The duration of the exam is two hours, wrong markings are not evaluated, and the success rate is 75%. If the exam is not successful and the number of exams re-entered is 3, it is required to attend an additional theoretical course in order to re-enter the theoretical exam. There is no limit for the number of Helicopter Type Instructor Learning and Teaching exams.

b. Theoretical knowledge exam principles related to the technical training are as follows.

1) The student who has completed the theoretical training of the Helicopter Type Rating Instructor course is subjected to an exam from the theoretical knowledge course subjects specified in App-8.

2) The theoretical examination is given by an examiner authorized by the General Directorate of Civil Aviation or a Type Rating Instructor (TRI/H).

3) The questions selected by the Instructor before the exam are transferred to the exam paper. After the questions are answered by the student, the evaluation is made, and the result is written on the exam document.

4) The theoretical exam, which is the basis for obtaining a Type Rating Instructor's authorization, consists of at least 25 multiple-choice questions. Exam duration is one-hour, incorrect markings are not evaluated, and the success rate is 75%.

c. The candidate who wants to get the Helicopter Type Rating Instructor authorization for the first time, as the Final Assessment; must pass the Flight Instructor (FI) Skill test. The basics of the skill test are explained below:

(1) In line with FCL.935, Helicopter TRI Competency Assessment is made by the FIE or Type Rating Examiner (TRE/H) after informing the General Directorate of Civil Aviation.
(2) The trainee takes the test in the seat where the Type Rating Instructor should normally sit. In the other seat TRI/H or TRE/H in the student role who will do the test. If another TRI/H sits in the front seat in the student role, the TRE/H authorized to check takes a seat in the back and performs the test.
(3) If any part of the test is unsuccessful, the test is renewed. If the first part is unsuccessful, the test is repeated only for this part. Test must be completed within 6 months
(4) The examiner may terminate the test at any stage where he deems the applicant unsatisfactory.

d. Candidates holding a helicopter flight instructor (FI/H) certificate, or a Type Rating Instructor (TRI/H) certificate are not taken to examination and test at the end of the training.

TRI(H) Revalidation and Renewal (FCL.940.TRI)

According to PART FCL and SHT FCL, TRI privileges granted by DGCA are valid for three years.

(a) Revalidation

(1) To revalidate a TRI (H) certificate, applicants shall, within the validity period of the TRI certificate fulfil **at least two out of the three following** requirements:

(i) completed at least 50 hours of flight instruction in each of the types of aircraft for which instructional privileges are held or in an FSTD representing those types, of which at least 15 hours shall be completed in the period of 12 months immediately preceding the expiry date of the TRI certificate. In the case of a TRI(H), the time flown as FIs, instrument rating instructors (IRIs), synthetic training instructors (STIs) or as any kind of examiners shall be accounted for this purpose;

(ii) complete instructor refresher training as a TRI(H) ,as relevant, at an ATO;

(iii) in the period of 12 months immediately preceding the expiry date of the certificate, passed an assessment of competence in accordance with points FCL.935, FCL.910.TRI(b)(3) or FCL.910.TRI(c)(3), as applicable.

(2) For at least each alternate revalidation of a TRI certificate, holders shall pass the assessment of competence in accordance with point FCL.935.

(3) If TRIs hold a certificate for more than one type of aircraft within the same category, the assessment of competence taken on one of those types of aircraft shall revalidate the TRI certificate for the other types held within the same category of aircraft, unless it is otherwise determined in the OSD.

(4) Specific requirements for the revalidation of a TRI(H) certificate

TRIs(H) holding an FI(H) certificate in the relevant type shall be deemed to comply with the requirements in point (a). In that case, the TRI(H) certificate shall be valid until the expiry date of the FI(H) certificate.

(b) Renewal

To renew a TRI certificate, applicants shall, within the 12 months immediately preceding the date of the application, have passed the assessment of competence in accordance with point FCL.935 and shall have completed the following:

(1) at least 10 hours of flight time, including take-offs and landings on the applicable aircraft type, of which maximum 5 hours may be completed in an FFS or FTD 2/3.

(2) instructor refresher training as a TRI at an ATO, which shall cover the relevant elements of the TRI training course.

(3) If applicants held a certificate for more than one type of aircraft within the same category, the assessment of competence taken on one of those types of aircraft shall renew the TRI certificate for the other types held within the same category of aircraft, unless it is otherwise determined in the OSD.

Instructor Competencies and Assessment (FCL.920, AMC1 FCL.920)

(a) Training will be both theoretical and practical. Practical elements will include the development of specific instructor skills, particularly in the area of teaching and assessing threat and error management and CRM.

(b) The training and assessment of instructors will be made against the following performance standards:

Competence	Performance	Knowledge
Prepare resources	(a) ensures adequate facilities; (b) prepares briefing material; (c) manages available tools; (d) plans training within the training envelope of the training platform, as determined by the ATO (Note: See GM1 ORA.ATO.125 point (f)).	(a) understand objectives; (b) available tools; (c) competency-based training methods; (d) understands the training envelope of the training platform, as determined by the ATO (Note: See GM1 ORA.ATO.125 point (f)) and avoids training beyond the boundaries of this envelope.
Create a climate conducive to learning	(a) establishes credentials, role models appropriate behaviour; (b) clarifies roles; (c) states objectives; (d) ascertains and supports student pilot’s needs.	(a) barriers to learning; (b) learning styles.
Present knowledge	(a) communicates clearly; (b) creates and sustains realism; (c) looks for training opportunities.	teaching methods
Integrate TEM and CRM	(a) makes TEM and CRM links with technical training;	(a) TEM and CRM;

Competence	Performance	Knowledge
		(b) Causes and countermeasures against undesired aircraft states
Manage time to achieve training objectives	Allocates the appropriate time to achieve competency objective.	syllabus time allocation
Facilitate learning	(a) encourages trainee participation; (b) shows motivating, patient, confident and assertive manner; (c) conducts one-to-one coaching; (d) encourages mutual support.	(a) facilitation; (b) how to give constructive feedback; (c) how to encourage trainees to ask questions and seek advice.
Assesses trainee performance	(a) assesses and encourages trainee self-assessment of performance against competency standards; (b) makes assessment decision and provides clear feedback; (c) observes CRM behaviour.	(a) observation techniques; (b) methods for recording observations.
Monitor and review progress	(a) compares individual outcomes to defined objectives; (b) identifies individual differences in learning rates; (c) applies appropriate corrective action.	(a) learning styles; (b) strategies for training adaptation to meet individual needs.
Evaluate training sessions	(a) elicits feedback from student pilots; (b) tracks training session processes against competence criteria; (c) keeps appropriate records.	(a) competency unit and associated elements; (b) performance criteria.
Report outcome	Reports accurately using only observed actions and events.	(a) phase training objectives; (b) individual versus systemic

1.6.1.3.1 TRI Refresher Seminar Program
(AMC1 FCL.940.TRI(a)(1)(ii), (a)(2)(ii), (b)(1)(ii), (b)(2)(ii))

(**a**) The refresher training for revalidation of the TRI and SFI certificates should be provided as a seminar. The seminar should consist of 6 hours of learning and may be held in the form of either one or more of the following: e-learning, two-way online meetings, face-to-face seminars. The content of the refresher seminar for revalidation should be selected from the following items:

(1) relevant changes to SHT/Part-FCL;

(2) the role of the instructor;

(3) teaching and learning styles;

(4) observational skills;

(5) instructional techniques;

(6) briefing and debriefing skills;

(7) TEM (Thread and Error Management);

(8) human performance and limitations;

(9) flight safety, prevention of incidents and accidents, including those specific to the ATO;

(10) significant changes in the content of the relevant part of the aviation system;

(11) legal aspects and enforcement procedures;

(12) developments in competency-based instruction;

(13) report writing; and

(14) any additional topics proposed by the competent authority.

(b) For the refresher training for renewal of the TRI certificates:

(1) the ATO should determine on a case-by-case basis the amount of refresher training needed, through an assessment of the candidate, taking into account the following factors:

(i) the experience of the applicant;

(ii) the amount of time elapsed since the expiry of the TRI or SFI certificate; and

(iii) the technical elements of the TRI or SFI training course, as determined by the assessment of the candidate by the ATO;

(2) the ATO should also consider the elements defined in point (a) above to determine the refresher training needed; and

(3) once the ATO has determined the needs of the applicant, it should develop an individual training programme that should be based on the content of the TRI or SFI training course and focus on the aspects where the applicant has the greatest needs.

(c) After successful completion of the seminar or refresher training, as applicable, the ATO should:

(1) in case of a seminar, in accordance with point (a), issue the applicant with a seminar completion certificate or another document specified by the competent authority, which describes the content of the seminar as in point (a), as well as a statement that the seminar was successfully completed; and

(2) in case of refresher training, in accordance with point (b), issue the applicant with a training completion certificate or another document specified by the competent authority, which describes the evaluation of the factors listed in point (b)(1) and the training received, as well as a statement that the training was successfully completed; the training completion certificate should be presented to the examiner prior to the assessment of competence.

(d) Upon successful completion of the seminar or refresher training, as applicable, the ATO should submit the seminar or training completion certificate, or the other document specified by TR DGCA, to TR DGCA.

1.6.1.4 Helicopter Type Rating Examiner (TRE) Standardisation Course (TRE Refresher Seminar Program) (SHT-CONTROL PILOT, FCL.1015, AMC1 FCL.1015, AMC2 FCL.1015, GM1 FCL.1015, GM1 FCL.1015(a); FCL.1025(b)(2), AMC1 FCL.1020, FCL.1025, AMC1 FCL.1020, GM1 FCL.1015(a), FCL.1025(b)(2), FCL.1030, AMC1 FCL.1030(b)(3), GM1 FCL.1030(b)(3)(ii), FCL.1005,FCL.1010)

1.6.1.4.1. General Principles Regarding the Structure of the Course:

- **a.** Helicopter Type Rating Examiner Standardisation course is one of the sub-courses that KAAN APPROVED TRAINING ORGANIZATION is authorized to give.
- **b.** The principles specified in the KAAN AIR ATO Operation Manual also cover the operating requirements of the Helicopter Type Rating Examiner Standardisation Course.
- **c.** All the principles stated in the KAAN AIR ATO Operation Manual are also valid for the Helicopter Type Rating Examiner Standardisation course.
- **d.** In this section, only the principles and training programs specific to the Helicopter Type Rating Examiner Standardisation Course are stated.

1.6.1.4.2. The Aim of the Course

The purpose of the Helicopter Type Rating Examiner Standardisation course; is to train helicopter instructors holders at a level that can provide helicopter type rating examiner. Candidates for this:

- **a.** To update and refresh technical knowledge,
- **b.** To enable them to come to a level that can teach theoretical lessons and flight maneuvers,
- **c.** To raise their flying skills to the next level,
- **d.** To enable them to gain high flight safety awareness.
- **e.** To enable them to gain skills to make tests and checks according to SHT-CONTROL PILOT and EASA PART FCL Subpart-K Examiners.

1.6.1.4.3. General prerequisites and requirements for Examiners (FCL.1000, FCL.1010, AMC1 FCL.1010)

(a) Holders of an examiner certificate shall:

(1) hold, unless otherwise determined in this Manual, an equivalent licence, rating or certificate to the ones for which they are authorised to conduct skill tests, proficiency checks or assessments of competence and the privilege to instruct for them;

(2) be qualified to act as PIC in the aircraft during a skill test, proficiency check or assessment of competence if conducted on the aircraft.

(b) Special conditions:

(1) The Turkish DGCA may issue a specific certificate granting privileges for the conduct of skill tests, proficiency checks and assessments of competence if compliance with the requirements established in this Subpart is not possible because of the introduction of any of the following:

(i) new aircraft in an operator's fleet;

(ii) new training courses in SHT/Part-FCL.

Such a certificate shall be limited to the skill tests, proficiency checks and assessments of competence necessary for the introduction of the new type of aircraft or the new training course and its validity shall not, in any case, exceed 1 year.

(2) Holders of a certificate issued in accordance with point (b)(1) who wish to apply for an examiner certificate shall comply with the prerequisites and revalidation requirements for that category of examiner certificate.

(3) Where no qualified examiner is available, competent authorities may, on a case-by -case basis, authorise inspectors or examiners who do not meet the relevant instructor, type or class rating

requirements as specified in (a), to perform skill tests, proficiency checks and assessments of competence.

(c) Applicants for an examiner certificate shall demonstrate:

(aa) relevant knowledge, background and appropriate experience related to the privileges of an examiner;

(bb) that they have not been subject to any sanctions, including the suspension, limitation or revocation of any of their licenses, ratings or certificates issued in accordance with SHT/Part-FCL, for non-compliance with the TR DGCA / EASA regulations during the last 3 years.

When evaluating the applicant's background, the Turkish DGCA should evaluate the personality and character of the applicant, and his/her cooperation with the Turkish DGCA .

The Turkish DGCA may also take into account whether the applicant has been convicted of any relevant criminal or other offenses, taking into account national law and principles of non-discrimination.

1.6.1.4.4. TRE Privileges and conditions (FCL.1005.TRE)

The privileges of a TRE(H) are to conduct:

(1) skill tests and proficiency checks for the issue, revalidation or renewal of helicopter type ratings;

(2) proficiency checks for the revalidation or renewal of IRs, provided the TRE(H) holds a valid IR(H);

(3) skill tests for ATPL(H) issue;

(4) assessments of competence for the issue, revalidation or renewal of a TRI(H) or SFI(H) certificates, provided that they have completed at least 3 years as a TRE and have undergone specific training for the assessment of competence in accordance with point FCL.1015 (b).

1.6.1.4.5. Special Conditions (GM1 FCL.1000, GM2 FCL.1000)

When new aircraft are introduced, requirements such as to hold a licence and rating equivalent to the one for which the skill test is being conducted, or to have adequate flight experience, may not be possible to comply with. In this case, to allow for the first ratings for these aircraft to be issued to applicants, competent authorities need the possibility to issue a specific certificate that does not have to comply with the requirements established in this Subpart.

The Turkish DGCA should only give these certificates to holders of other examiner certificates. As far as possible, preference should be given to persons with experience in similar types or classes of aircraft, for example, in aircraft having the same kind and number of engines or rotors and of the same order of mass or technology.

The certificate should be limited in validity to the time needed to qualify the first examiners for the new aircraft in accordance with this Subpart, but in any case, it should not exceed the 1 year established in the rule.

When examiners conduct a skill test, proficiency check or assessment of competence, in addition to a licence for the relevant aircraft category, they are required to hold the rating or certificate equivalent to the one for which they conduct the skill test, proficiency check or assessment of competence.

Examiners shall not conduct:

(a) skill tests or assessments of competence of applicants for the issue of a licence, rating or certificate to whom they have provided more than 25 % of the required flight instruction for the licence, rating or certificate for which the skill test or assessment of competence is being taken; and

(b) skill tests, proficiency checks or assessments of competence whenever they feel that their objectivity may be affected.

Examples of a situation where the examiner should consider if their objectivity is affected are when the applicant is a relative or a friend of the examiner, or when they are linked by economic interests or political affiliations, etc.

1.6.1.4.6. For TRE(H) Prerequisites (FCL.1010.TRE)

TRE(H). Applicants for a TRE (H) certificate for helicopters shall:

(1) hold a TRI(H) certificate or, in the case of single-pilot single-engine helicopters, a valid FI(H) certificate, for the applicable type;

(2) for the initial issue of a TRE certificate, have completed 50 hours of flight instruction as a TRI, FI or SFI in the applicable type or an FSTD representing that type;

(3) in the case of multi-pilot helicopters, hold a CPL(H) or ATPL(H) and have completed 1500 hours of flight as a pilot on multi-pilot helicopters, of which at least 500 hours shall be as PIC;

(4) in the case of single-pilot multi-engine helicopters:

(i) have completed 1000 hours of flight as pilot on helicopters, of which at least 500 hours shall be as PIC;

(ii) hold a CPL(H) or ATPL(H) and, when applicable, a valid IR(H;

(5) in the case of single-pilot single-engine helicopters:

(i) have completed 750 hours of flight as a pilot on helicopters, of which at least 500 hours shall be as PIC;

(ii) hold a CPL(H) or ATPL(H).

(6) Before the privileges of a TRE(H) are extended from single-pilot operations to multi-pilot operations on the same type of helicopter, the holder shall have either:

(i) at least 100 hours in multi-pilot operations on this type; or

(ii) at least 350 hours in multi-pilot operations in any aircraft category.

(7) In the case of applicants for the first multi-pilot multi-engine TRE certificate, the 1500 hours of flight experience on multi-pilot helicopters required in (b)(3) may be considered to have been met if they have completed the 500 hours of flight time as PIC on a multi-pilot helicopter of the same type.

1.6.1.4.7. Training Principles (FCL.1015, AMC1 FCL.1015)

(a) An applicant for an examiner certificate shall undertake a **standardisation course** which is provided by TR DGCA or which is provided by an ATO and approved by TR DGCA.

(b) The standardisation course shall consist of theoretical and practical instruction and shall include, at least:

(1) the conduct of 2 skill tests, proficiency checks or assessments of competences for the licences, ratings or certificates for which the applicant seeks the privilege to conduct tests and checks;

(2) instruction on the applicable requirements in SHT/Part-FCL and the applicable air operations requirements, the conduct of skill tests, proficiency checks and assessments of competence, and their documentation and reporting;

(3) a briefing on the national administrative procedures, requirements for protection of personal data, liability, accident insurance and fees.

(4) a briefing on the need to review and apply the items in (3) when conducting skill tests, proficiency checks or assessments of competence of an applicant for which TR DGCA is not the same that issued the examiner's certificate; and

(5) an instruction on how to get access to these national procedures and requirements of other competent authorities when needed;

(c) Holders of an examiners certificate shall not conduct skill tests, proficiency checks or assessments of competence of an applicant for which the competent authority is not the same that issued the examiner's certificate, unless they have reviewed the latest available information containing the relevant national procedures of the applicant's competent authority.

General

(a) TR DGCA may provide the course itself or through an arrangement with an ATO. This arrangement should clearly state that the ATO is acting under the management system of TR DGCA.

(b) The course should last:

(1) for the FE and FIE, at least 1 day, divided into theoretical and practical training;

(2) for other examiners, **at least 3 days**, divided into **theoretical training (1 day)** and **practical training** in an FFS conducting real or role-played proficiency checks, skill tests or assessments of competence **(at least 2 days)**.

(c) TR DGCA, the ATO should determine any further training required before presenting the candidate for the examiner assessment of competence.

Content

(d) The training should comprise:

(1) Theoretical training covering at least:

(i) the contents of AMC2 FCL.1015 and the FEM;

(ii) SHT/Part-FCL and related AMCs and GM relevant to their duties;

(iii) operational requirements and related AMCs and GM relevant to their duties;

(iv) national requirements relevant to their examination duties;

(v) fundamentals of human performance and limitations relevant to flight examination;

(vi) fundamentals of evaluation relevant to applicant's performance;

(vii) the management system of ATOs;

(viii) MCC, human performance and limitations, if applicable.

(2) Examiners should also be briefed on the protection requirements for personal data, liability, accident insurance and fees, as applicable in the member state concerned.

(3) All items above are the core knowledge requirements for an examiner and are recommended as the core course material. This core course may be studied before recommended examiner training is commenced. The core course may utilise any suitable training format.

(4) Practical training consisting of at least:

(i) knowledge and management of the test for which the certificate is to be sought. These are described in the relevant modules in the FEM;

(ii) knowledge of the administrative procedures pertaining to that test or check.

(5) For an initial examiner certificate, practical training should include the examination of the test profile sought, consisting of the conduct of at least two test or check profiles in the role of examiner (these two tests or checks profiles can be performed in the same simulator session), including briefing, conduct of the skill test and proficiency check, assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner of the appropriate category on the applicable type. This training is conducted in the aircraft if approval for testing or checking in the aircraft is required. If examiner privileges in FSTD's are required, practical instruction in the use of FSTD(s) for testing or checking should also be completed.

(6) If examiner privileges are to include the conduct of proficiency checks for the revalidation or renewal of an instrument rating, practical instruction should include the conduct of **at least four instrument check** profiles in the role of examiner, including briefing, conduct of the skill test and proficiency check,

assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner of the appropriate category on the applicable type. This training is conducted in the aircraft if approval for testing or checking in the aircraft is required. If examiner privileges in both FSTD and aircraft are required, at least one of the instrument check profiles should be conducted in an FSTD.

(7) For extension of an examiner certificate to further types (as required for TRE), further practical training on the new type may be required, consisting of the conduct of **at least one test or check** profile in the role of examiner on the new type, including briefing, conduct of the skill test and proficiency check, assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner of the appropriate category on the applicable type. A further examiner check on the new type may be required, which may be supervised by an inspector of TR DGCA or a suitably authorised senior examiner.

1.6.1.4.8. Standardisation Arrangements For Examiners (AMC2 FCL.1015)

Limitations

(a) An examiner should allow an applicant adequate time to prepare for a test or check, normally not more than 1 hour.

(b) An examiner should plan a test or check flight so that all required exercises can be performed while allowing sufficient time for each of the exercises and with due regard to the weather conditions, traffic situation, ATC requirements and local procedures.

Purpose Of A Test Or Check

(c) Determine through practical demonstration during a test or check that an applicant has acquired or maintained the required level of knowledge and skill or proficiency.

(d) Improve training and flight instruction in ATOs by feedback of information from examiners about items or sections of tests or checks that are most frequently failed.

(e) Assist in maintaining and, where possible, improving air safety standards by having examiners display good airmanship and flight discipline during tests or checks.

Conduct Of Test Or Check

(f) An examiner will ensure that an applicant completes a test or check in accordance with SHT/Part-FCL requirements and is assessed against the required test or check standards.

(g) Each item within a test or check section should be completed and assessed separately. The test or check schedule, as briefed, should not normally be altered by an examiner. A failed item is not always a failed section, for example type rating skill test where a failure of an item in a section does not fail the entire section, only the failed item is taken again.

(h) Marginal or questionable performance of a test or check item should not influence an examiner's assessment of any subsequent items.

(i) An examiner should verify the requirements and limitations of a test or check with an applicant during the pre-flight briefing.

(j) When a test or check is completed or discontinued, an examiner should debrief the applicant and give reasons for items or sections failed. In case of a failed or discontinued skill test and proficiency check, the examiner should provide appropriate advice to assist the applicant in re-tests or re-checks.

(k) Any comment on, or disagreement with, an examiner's test or check evaluation or assessment made during a debriefing will be recorded by the examiner on the test or check report and will be signed by the examiner and countersigned by the applicant.

Examiner Preparation

(l) An examiner should supervise all aspects of the test or check flight preparation, including, where necessary, obtaining or assuring an ATC 'slot' time.

(m) An examiner will plan a test or check in accordance with SHT/Part-FCL requirements. Only the manoeuvres and procedures set out in the appropriate test or check form will be undertaken. The same examiner should not reexamine a failed applicant without the agreement of the applicant.

Examiner Approach

(n) An examiner should encourage a friendly and relaxed atmosphere to develop both before and during a test or check flight. A negative or hostile approach should not be used. During the test or check flight, the examiner should avoid negative comments or criticisms and all assessments should be reserved for the debriefing.

Assessment System

(o) Although test or checks may specify flight test tolerances, an applicant should not be expected to achieve these at the expense of smoothness or stable flight. An examiner should make due allowance for unavoidable deviations due to turbulence, ATC instructions, etc. An examiner should terminate a test or check only when it is clear that the applicant has not been able to demonstrate the required level of knowledge, skill or proficiency and that a full re-test will be necessary or for safety reasons. An examiner will use one of the following terms for assessment:

(1) a 'pass', provided that the applicant demonstrates the required level of knowledge, skill or proficiency and, where applicable, remains within the flight test tolerances for the licence or rating;

(2) a 'fail' provided that any of the following apply:

(i) the flight test tolerances have been exceeded after the examiner has made due allowance for turbulence or ATC instructions;

(ii) the aim of the test or check is not completed;

(iii) the aim of exercise is completed but at the expense of safe flight, violation of a rule or regulation, poor airmanship or rough handling;

(iv) an acceptable level of knowledge is not demonstrated;

(v) an acceptable level of flight management is not demonstrated;

(vi) the intervention of the examiner or safety pilot is required in the interest of safety.

(3) a 'partial pass' in accordance with the criteria shown in the relevant skill test appendix of SHT/Part-FCL.

Method And Contents Of The Test Or Check

(p) Before undertaking a test or check, an examiner will verify that the aircraft or FSTD intended to be used is suitable and appropriately equipped for the test or check. Aircraft that fall under points (a), (b), (c), or (d) of Annex I to the Basic Regulation can be used provided that they are subject to an authorisation as per point ORA.ATO.135.

(q) A test or check flight will be conducted in accordance with the AFM/RFM.

(r) A test or check flight will be conducted within the limitations contained in the operations manual of an ATO.

(s) Contents:

(1) a test or check is comprised of:

(i) oral examination on the ground (where applicable);

(ii) pre-flight briefing;

(iii) in-flight exercises;

(iv) post-flight debriefing.

(2) oral examination on the ground should include:

(i) aircraft general knowledge and performance;

(ii) planning and operational procedures;

(iii) other relevant items or sections of the test or check.

(3) pre-flight briefing should include:

(i) test or check sequence;

(ii) power setting, speeds and approach minima, if applicable;

(iii) safety considerations.

(4) in-flight exercises will include each relevant item or section of the test or check;

(5) post-flight debriefing should include:

(i) assessment or evaluation of the applicant;

(ii) documentation of the test or check with the applicant's FI present, if possible.

(t) A test or check is intended to simulate a practical flight. Thus, an examiner may set practical scenarios for an applicant while ensuring that the applicant is not confused and air safety is not compromised.

(u) When manoeuvres are to be flown by sole reference to instruments, the examiner should ensure that a suitable method of screening is used to simulate IMC.

(v) An examiner should maintain a flight log and assessment record during the test or check for reference during the post or flight debriefing.

(w) An examiner should be flexible to the possibility of changes arising to preflight briefings due to ATC instructions, or other circumstances affecting the test or check.

(x) Where changes arise to a planned test or check an examiner should be satisfied that the applicant understands and accepts the changes. Otherwise, the test or check flight should be terminated.

(y) Should an applicant choose not to continue a test or check for reasons considered inadequate by an examiner, the applicant will be assessed as having failed those items or sections not attempted. If the test or check is terminated for reasons considered adequate by the examiner, only these items or sections not completed will be tested during a subsequent test or check.

(z) An examiner may terminate a test or check at any stage, if it is considered that the applicant's competency requires a complete re-test or re-check.

Details of Conducting Check or Test (GM1 FCL.1015)

(a) An examiner should plan per day not more than:

(1**) three** tests or checks relating to PPL, CPL, IR or class ratings;

(2**) four** tests or checks relating to LAPL, SPL or BPL;

(3) **two** tests or checks related to MPL or ATPL;

(4) **two** assessments of competence related to instructor certificates;

(5) **four** tests or checks relating to SP type ratings.

(b) An examiner should plan at least 2 hours for a LAPL, SPL or BPL, 3 hours for a PPL, CPL, IR or class rating test or checks, and at least 4 hours for instructor certificates, MPL, ATPL or MP type rating tests or checks, including preflight briefing and preparation, conduct of the test, check or assessment of competence, de-briefing, evaluation of the applicant and documentation.

(c) For the conduct of the test, check or assessment of competence, without additional activities specified in point (b), the following values may be used as guidance:

(1) 45 minutes for a LAPL(B) or BPL and SP class ratings VFR only;

(2) 60 minutes for extension of BPL commercial privileges;

(3) 90 minutes for LAPL(A) or (H), PPL(A) or (H), and CPL(A) or (H), including the navigation section;

(4) 60 minutes for PPL(As) and CPL(As);

(5) 60 minutes for IR, EIR, instructor certificates, and SP type or class ratings; and

(6) 120 minutes for MPL, ATPL, and MP type ratings.

(d) For the LAPL(S) and SPL test or check flight the flight time must be sufficient to allow that all the items in each test or check section can be fully completed. If not all the items can be completed in one flight, additional flights have to be done.

1.6.1.4.9. Examiners Assessment of Competence (FCL.1020, AMC1 FCL.1020)

Applicants for an examiner certificate shall demonstrate their competence to an inspector from the Turkish DGCA or a senior examiner specifically authorised to do so by the Turkish DGCA responsible for the examiner's certificate through the conduct of a skill test, proficiency check or assessment of competence in the examiner role for which privileges are sought, including briefing, conduct of the skill test, proficiency check or assessment of competence, and assessment of the person to whom the test, check or assessment is given, debriefing and recording documentation.

General

(a) The Turkish DGCA may nominate either one of its inspectors or a senior examiner to assess the competence of applicants for an examiner certificate.

Definitions

(b) Definitions:

(1) 'Inspector': the inspector of the Turkish DGCA conducting the examiner competence assessment;

(2) 'Examiner applicant': the person seeking certification as an examiner;

(3) 'Candidate': the person being tested or checked by the examiner applicant. This person may be a pilot for whom the test or check would be required, or the inspector of the Turkish DGCA who is conducting the examiner certification acceptance test.

Conduct of the Assessment

(c) An inspector of the Turkish DGCA or a senior examiner will observe all examiner applicants conducting a test on a 'candidate' in an aircraft for which examiner certificate is sought. Items from the related training course and test or check schedule will be selected by the inspector for examination of the 'candidate' by the examiner applicant. Having agreed with the inspector the content of the test, the examiner applicant will be expected to manage the entire test. This will include briefing, the conduct of the flight, assessment and debriefing of the 'candidate'. The inspector will discuss the assessment with the examiner applicant before the 'candidate' is debriefed and informed of the result.

Briefing The 'Candidate'

(d) The 'candidate' should be given time and facilities to prepare for the test flight. The briefing should cover the following:

(1) the objective of the flight;

(2) licensing checks, as necessary;

(3) freedom for the ‘candidate’ to ask questions;

(4) operating procedures to be followed (for example operators manual);

(5) weather assessment;

(6) operating capacity of ‘candidate’ and examiner;

(7) aims to be identified by ‘candidate’;

(8) simulated weather assumptions (for example icing and cloud base);

(9) use of screens (if applicable);

(10) contents of exercise to be performed;

(11) agreed speed and handling parameters (for example V-speeds, bank angle, approach minima);

(12) use of R/T;

(13) respective roles of ‘candidate’ and examiner (for example during emergency);

(14) administrative procedures (for example submission of flight plan).

(e) The examiner applicant should maintain the necessary level of communication with the ‘candidate’. The following check details should be followed by the examiner applicant:

(1) involvement of examiner in a MP operating environment;

(2) the need to give the ‘candidate’ precise instructions;

(3) responsibility for safe conduct of the flight;

(4) intervention by examiner, when necessary;

(5) use of screens;

(6) liaison with ATC and the need for concise, easily understood intentions;

(7) prompting the ‘candidate’ about required sequence of events (for example following a go-around);

(8) keeping brief, factual and unobtrusive notes.

Assessment

(f) The examiner applicant should refer to the flight test tolerances given in the relevant skill test. Attention should be paid to the following points:

(1) questions from the ‘candidate’;

(2) give results of the test and any sections failed;

(3) give reasons for failure.

Debriefing

(g) The examiner applicant should demonstrate to the inspector the ability to conduct a fair, unbiased debriefing of the ‘candidate’ based on identifiable factual items. A balance between friendliness and firmness should be evident. The following points should be discussed with the ‘candidate’, at the applicant’s discretion:

(1) advise the candidate on how to avoid or correct mistakes;

(2) mention any other points of criticism noted;

(3) give any advice considered helpful.

Recording Or Documentation

(h) The examiner applicant should demonstrate to the inspector the ability to complete the relevant records correctly. These records may be:

(1) the relevant test or check form;

(2) licence entry;

(3) notification of failure form;

(4) relevant company forms where the examiner has privileges of conducting operator proficiency checks.

Demonstration Of Theoretical Knowledge

(i) The examiner applicant should demonstrate to the inspector a satisfactory knowledge of the regulatory requirements associated with the function of an examiner.

1.6.1.4.10. Validity, revalidation and renewal of examiner certificates (FCL.1025, AMC1 FCL.1025)

(a) Validity

An examiner certificate shall be valid for 3 years.

(b) Revalidation

To revalidate an examiner certificate, holders shall comply with all of the following conditions:

(1) before the expiry date of the certificate, have conducted at least six skill tests, proficiency checks, assessments of competence, or EBT evaluation phases during an EBT module referred to in point ORO.FC.231 of Annex III (Part-ORO) to Regulation (EU) No 965/2012;

(2) in the period of 12 months immediately preceding the expiry date of the certificate, have completed an examiner refresher course which is provided by the Turkish DGCA or which is provided by an ATO and approved by the Turkish DGCA ;

(3) one of the skill tests, proficiency checks, assessments of competence or EBT evaluation phases conducted in accordance with point (1) shall take place in the period of 12 months immediately preceding the expiry date of the examiner certificate and shall:

(i) have been assessed by an inspector from the Turkish DGCA or by a senior examiner specifically authorised to do so by the Turkish DGCA responsible for the examiner certificate; or

(ii) comply with the requirements in point FCL.1020.

If applicants for the revalidation hold privileges for more than one category of examiner, all examiner privileges may be revalidated if applicants comply with the requirements laid down in points (b)(1) and (2) and point FCL.1020 for one of the categories of examiner certificates held, in agreement with the Turkish DGCA .

(c) Renewal

If the certificate has expired, before resuming the exercise of the privileges, the applicants shall comply with the requirements in point (b)(2) and point FCL.1020 in the period of 12 months immediately preceding the application for the renewal.

(d) An examiner certificate shall only be revalidated or renewed if applicants demonstrate continued compliance with the requirements laid down in points FCL.1010 and FCL.1030.

1.6.1.4.11. Qualification of Senior Examiners (AMC1 FCL.1020; FCL.1025)

(a) A senior examiner specifically tasked by the Turkish DGCA to observe skill tests or proficiency checks for the revalidation of examiner certificates should:

(1) hold a valid or current examiner certificate appropriate to the privileges being given;

(2) have examiner experience level acceptable to the Turkish DGCA ;

(3) have conducted a number of skill tests or proficiency checks as a Part-FCL examiner.

(b) The Turkish DGCA may conduct a pre-assessment of the applicant or candidate carrying out a skill test and proficiency check under supervision of an inspector of the Turkish DGCA .

(c) Applicants should be required to attend a senior examiner briefing, course or seminar arranged by the Turkish DGCA . Content and duration will be determined by the Turkish DGCA and should include:

(1) pre-course self-study;

(2) legislation;

(3) the role of the senior examiner;

(4) an examiner assessment;

(5) national administrative requirements.

(d) The validity of the authorisation should not exceed the validity of the examiners certificate, and in any case should not exceed 3 years. The authorisation may be revalidated in accordance with procedures established by the Turkish DGCA .

1.6.1.4.12. Examiner Refresher Course (AMC1 FCL.1025)

The examiner refresher course should follow the content of the examiner standardisation course, included in AMC1 FCL.1015, and take into account specific contents adequate to the category of examiner affected.

1.6.1.4.13. Conduct of skill tests, proficiency checks and assessments of competence (FCL.1030)

(a) When conducting skill tests, proficiency checks and assessments of competence, examiners shall:

(1) ensure that communication with the applicant can be established without language barriers;

(2) verify that the applicant complies with all the qualification, training and experience requirements in this Part for the issue, revalidation or renewal of the licence, rating or certificate for which the skill test, proficiency check or assessment of competence is taken;

(3) make the applicant aware of the consequences of providing incomplete, inaccurate or false information related to their training and flight experience.

(b) After completion of the skill test or proficiency check, the examiner shall:

(1) inform the applicant of the result of the test. In the event of a partial pass or fail, the examiner shall inform the applicant that he/she may not exercise the privileges of the rating until a full pass has been obtained. The examiner shall detail any further training requirement and explain the applicant’s right of appeal;

(2) in the event of a pass in a proficiency check or assessment of competence for revalidation or renewal, endorse the applicant’s licence or certificate with the new expiry date of the rating or certificate, if specifically authorised for that purpose by the Turkish DGCA responsible for the applicant’s licence;

(3) provide the applicant with a signed report of the skill test or proficiency check and submit without delay copies of the report to the Turkish DGCA responsible for the applicant’s licence, and to the Turkish DGCA that issued the examiner certificate. The report shall include:

(i) a declaration that the examiner has received information from the applicant regarding his/her experience and instruction, and found that experience and instruction complying with the applicable requirements in this Part;

(ii) confirmation that all the required manoeuvres and exercises have been completed, as well as information on the verbal theoretical knowledge examination, when applicable. If an item has been failed, the examiner shall record the reasons for this assessment;

(iii) the result of the test, check or assessment of competence;

(iv) a declaration that the examiner has reviewed and applied the national procedures and requirements of the applicant’s Turkish DGCA if the Turkish DGCA responsible for the applicant’s licence is not the same that issued the examiner’s certificate;

(v) a copy of the examiner certificate containing the scope of his/her privileges as examiner in the case of skill tests, proficiency checks or assessments of competence of an applicant for which the Turkish DGCA is not the same that issued the examiner’s certificate.

(c) Examiners shall maintain records for 5 years with details of all skill tests, proficiency checks and assessments of competence performed and their results.

(d) Upon request by the Turkish DGCA responsible for the examiner certificate, or the Turkish DGCA responsible for the applicant's licence, examiners shall submit all records and reports, and any other information, as required for oversight activities.

1.6.1.4.14. Obligations For Examiners Application And Report Forms (AMC1 FCL.1030(b)(3))

Common application and report forms can be found in APP-1 to APP11.

Helicopter Type Rating Examiner Standardisation Course Training Periods by Helicopter Class

HELICOPTER CLASS	**PART 1** **THEORETICAL TRAINING** (FCL.1015, AMC1 FCL.1015)	**PART 2** **PRACTICAL** (FCL.1015, AMC1 FCL.1015)
Helicopter Type Rating Examiner Standardisation **(FCL.1015)**	06:00 hrs	The conduct of 2 skill tests, proficiency checks or assessments of competences for the licenses, ratings or certificates for which the applicant seeks the privilege to conduct tests and checks. OR practical training in an FFS conducting real or role-played proficiency checks, skill tests or assessments of competence (at least 2 days).

NOTE: *The above flight hours are minimum and can be increased according to the candidate's situation and experience.*

1.6.1.5 Additional or Repeated Flight Training Topics

In the Training Manual, the Type Rating course flight training topics should be the same as the actual flight training topics. Additional flight training or repeated training should be detailed in the training program with the approval of the KAAN ATO Head of Training.

1.6.2 Adverse Weather Restrictions

If the weather conditions are not suitable and there is no contact with the ATC, the instructor will not force the conditions. If necessary, by keeping the flight safety the flight will be interrupted with the initiative of the instructor before completing the sortie. On days when there is no flight due to adverse weather conditions, technical knowledge training will continue, or the flight instructor will inform the student about the issues he deems inadequate. It will benefit from educational aids and publications that will make up for this deficiency.

NOTE: A program for unsuitable weather conditions is prepared and notified to the instructor and student pilot. Sundays are evaluated in order to complete training.

1.6.3 Maximum Time Limit on Daily / 7-Day/ 28-Day Flight, Theoretical Knowledge and Synthetic Training for Students

The maximum time limit for daily/7-day/28-day flight and theoretical training for students is shown in the table below.

- In case of flight/simulator and theoretical training on the same day, half of the maximum flight times specified in the table below are applied. However, the total of flight/simulator and theoretical training cannot exceed 8 hours in one day.

	DAILY	7 DAYS	28 DAYS
MAXIMUM CPL, IR, CLASS/ TYPE, SYNTETIC FLIGHT TIME	4 Hours	-	90 Hours
MAXIMUM THEORETICAL TRAINING TIME	8 Hours	40 Hours	-

1.6.4 Restrictions on Duty Time for Students and Other Details

a. Instructor pilots and candidates cannot fly if:

- When the period of periodic health and the validity of the license/certificates expire,
- Alcohol, sedative, cocaine, thinner, etc. taken,
- When a report is received for any inconvenience,
- When regular drug therapy is continued, which will require doctor control.

b. They cannot fly until 8 hours after drinking alcohol, 72 hours after donating blood, and 24 hours after vaccination.
c. During the flight training activity, the existing communication device on the aircraft cannot be turned off, even for training purposes.
d. The course program, course duration, flight and ground course durations in the OPERATION MANUAL cannot be reduced.
e. Before starting the type rating training, the General Directorate of Civil Aviation is informed by stating the nature and duration of the course and the identities of the participants.

	DAILY	7 DAYS	28 DAYS
MAX FLIGHT DUTY PERIOD	12 Hours	60 Hours	190 Hours
MAX FLIGHT TIME	4 Hours	-	-

1.6.5 Maximum Flight Time on Any Day/Night, Maximum Number of Flight Training on Any Day/Night

a. The maximum one-day/night flight time for students is 4 hours.
b. Flight training period is maximum 02:00 hours; Except for cruising flights.
c. The maximum daily/nightly flight time for instructor pilots is 6 hours.

1.6.6 Minimum Rest Period Between Duty Periods

a. Daily rest periods for students; the previous duty time or 12 hours, whichever is longer.
b. Duties and training cannot be planned by cutting rest periods.
c. In cases where students do flight training for two periods a day; The minimum rest period between both periods is 30 minutes.

1.7 TRAINING RECORDS

1.7.1 Rules for the Security of Records and Documents (ORA.GEN.220, AMC1 ORA.GEN.220(b), GM1 ORA.GEN.220(b))

a. The Compliance Monitoring Manager is responsible for the follow-up of the records and documents that KAAN ATO is obliged to keep.

b. The Chief Flight / Chief Theoretical Knowledge Instructor and the Head of Training are responsible for duly keeping and following up all kinds of records and documents related to flight and theoretical training.

c. A file is opened for each candidate who starts the course, at the end of the course, the file is archived and kept for 3 years.

d. Records are available electronically on the Head of Training's computer and in paper copies in department files. The computer is encrypted and cannot be opened by anyone other than the user.

1.7.2 Student Attendance Records (ORA.ATO.120, AMC1 ORA.ATO.120(a), (b))

a. Monitoring the student's course attendance and duty time; Article 1.6 is made in accordance with the Training Program, Flight and Flight Duty Periods Procedure (APP-5).

b. Candidates: they write the start, end times and daily flights of the mission on the form.

c. The Head of Training monitors the records of the students, either by himself or by a teacher he will assign. It makes task and flight planning in such a way that the daily/weekly/monthly flight and flight duty time limits are not exceeded.

1.7.3 Training Records Keeping Periods and Forms (ORA.ATO.120, AMC1 ORA.ATO.120(a), (b))

The storage periods of the records and documents to be kept during the Type Rating Training Course are shown in the table below.

TRAINING-RELATED RECORDS AND DOCUMENTS	FORM NUMBER	STORAGE PERIOD
Flight Training Evaluation Form (APP-1)		3 Years
Single Pilot Helicopter Type Rating Application and Training/Skill Test/Proficiency Check Result Form (APP-2)	TOF-01	3 Years
SHT / Part FCL Flight Instructor Rating - FI(H) Application And Skill Test Result Form (APP-3)	TOF-02	3 Years
Course Completion Certificate (APP-4)	TOF-04	3 Years
Theoretical Knowledge Course Exam Questions	-	3 Years
Theoretical Knowledge Course Exam Answer Key	-	3 Years
Theoretical Knowledge Course Exam Answer Sheet	-	3 Years
Flight and Flight Duty Period Registration Form (APP-5)	FOF-09	3 Years
Copy of License	-	3 Years
Copy of Instrument Flight Certificate	-	3 Years
Copy of Flight Instructor Certificate	-	3 Years
Copy of Medical Certificate	-	3 Years
Copy of Personal Flight Logbook	-	3 Years
Correspondence with the DGCA and Other Authorities on Candidates.	-	3 Years

The records and documents to be kept regarding the training are shown in the table below. The content and form of the records and documents are specified in Section-5 Appendixes and Forms with the annex number given in the table.

TRAINING-RELATED RECORDS AND DOCUMENTS	APPENDIX NUMBER	FORM NUMBER
Flight Training Evaluation Form	APP-1	
Single Pilot Helicopter Type Rating Application and Training/Skill Test/Proficiency Check Result Form	APP-2	TOF-01
SHT / Part FCL Flight Instructor Rating - FI(H) Application And Skill Test Result Form	APP-3	TOF-02
Theoretical Knowledge Course Exam Questions		-
Theoretical Knowledge Course Exam Answer Key		-
Theoretical Knowledge Course Exam Answer Sheet		-
Course Completion Certificate	APP-4	TOF-04
Flight and Flight Duty Period Registration Form	APP-5.1	FOF-09
Copy of License and Instrument Flight Certificate		-
Copy of Flight Instructor Certificate		-
Copy of Medical Certificate		-
Copy of Personal Flight Logbook		-
Correspondence with the General Directorate of Civil Aviation and Other Authorities on Candidates.		-

1.7.4 Personnel responsible for Controlling Records and Student Logbooks

ATO Head of Training is responsible for the relevant control.

1.7.5 How and How Often Records Will Be Checked

The student's records are duly kept by the flight instructor.

a. Control of records; In courses lasting less than a week, at the end of the course; In courses lasting longer than one week, it is done every Friday (if it cannot be done, at the first opportunity) and at the end of the course by the Head of Training or a Senior Instructor to be appointed.

b. In addition, in January of each year, all training records are checked by a Senior Instructor under the responsibility of the Head of Training or to be appointed by him/her. Documents whose function has expired are archived and documents whose storage period has expired are destroyed.

1.7.6 Standardization of Inputs of Education Records

a. For the pilot who has started the Type Rating Course, a file is opened by the flight instructor and the "Training records and documents" specified in the article 1.7.3 are kept in this file.

b. SHT / Part FCL and other DGCA regulations are taken as a basis for the entries of the records and documents related to education.

c. The compliance of the records with the standards is checked by the Head of Training.

1.7.7 Rules for How to Write Logbooks (FCL.050, AMC1 FCL.050)

a. The rules specified in AMC1 FCL.050 will be taken as basis when filling out personal flight logbooks.

b. Personal flight logs must be in the format accepted by DGCA.

c. Recordings will be made immediately after the flight, in ink and by the pilot himself/herself.

d. Flight instructors will record their flights in both the first pilot (pilot in command) and as flight instructor sections.

e. Students will register their flights in the 'dual' section; these flights will be approved by the instructor pilot using the notes and the remarks and endorsements section.

1.8 FLIGHT SAFETY

1.8.1 Personal Responsibilities

a. HEAD OF TRAINING: Observes that both the instructors and the trainees comply with the flight safety rules, detects the trouble, and immediately gives the necessary action. He / She works in coordination with the KAAN AIR Compliance Monitoring and Safety Manager and attends flight and ground safety meetings.

b. FLIGHT INSTRUCTORS: Sets a good example for his/her trainees by following all flight safety rules, and follows, observes, and trains the trainees' compliance with flight safety.

c. TRAINEES: They obey all flight safety rules and flight safety objectives taught to them. They report the events they detect or observe to their instructors. During solo flight, they do not make any flight movements other than what they have been taught and do not violate the flight rules.

1.8.2 Required Applications

a. The Head of Training works in coordination with the Compliance Monitoring and Safety Manager.

b. The Compliance Monitoring and Safety Manager includes the APPROVED TRAINING ORGANIZATION in its activities and exercises for the identified risk analysis.

1.8.3 How Frequent Emergency Drills will be Made

a. One or two emergencies are reviewed every day at pre-flight briefings.

b. After the emergency issues are covered, at least one emergency is created for the pilot in each flight period and the pilot's behavior is observed.

c. n the end-of-flight briefing held every day, the emergency applications made during the flight period are criticized. The correct course of action and its application is taught to the pilot.

d. In real emergencies that may be encountered during training, if the trainee has the controls will initiate the first action. The instructor or examiner will take over the controls at the first opportunity. The necessity of the emergency will be executed by considering the CRM principles.

e. If any equipment fails during the training, the training will continue based on the MEL.

1.9 FLIGHT CHECKS AND THEORETICAL KNOWLEDGE

1.9.1 Flight Training

1.9.1.1 Progress Tests

Progress Tests and Insufficient Development Measures are explained in detail in Section 1.10.4 and 1.10.5.

1.9.1.2 Skill Test (Appendix 9 to Part-FCL)

1.9.1.2.1 General

- **a.** After the type rating training, the student is subjected to a skill test.
- **b.** Before the skill test, the student must have taken the type rating flight training specified in item 1.4.2 and the type rating theoretical course specified in item 1.4.3 in accordance with the helicopter class.
- **c.** The skill test is performed by an examiner authorized by the General Directorate of Civil Aviation.
- **d.** Single pilot helicopter skill test is done according to Skill Test Application and Report Form (Appendix 3).
- **e.** The student must be successful in sections 1 to 4 of the skill test form for the Type Rating (VFR) and, if necessary, section six. If he/she fails more than 5 items, he/she retakes the entire skill test. If he/she fails in less than 5 items, he/she is only tested on the items he/she fails. During the re-test, if the student fails again or fails again in the subjects in which he has been successful before, the whole skill test is re-tested. All parts of the skill test must be completed within 6 months.
- **f.** The skill test consists of two parts: Type Rating (VFR) and Instrument Rating (IFR). Failure in any part does not affect the other part.
- **g.** The student must pass the fifth part of the skill test form for the Instrument Rating (IFR). If he/she fails more than 3 items, he/she retakes the entire skill test. If he/she fails in less than 3 items, he/she is only tested on the items he/she failed. During the re-test, if the student fails again or fails again in the subjects in which he has been successful before, the whole skill test is re-tested.
- **h.** If the student fails the entire skill test twice, he or she must undergo additional training. The amount and requirements of overtraining are determined by the examiner.

1.9.1.2.2 Test Practice Principles

- **a.** For the skill test to be carried out safely, the examiner is assigned by the DGCA.
- **b.** If the student, who is deemed inadequate by the examiner, ends the flight voluntarily, he enters the control again and is responsible for all maneuvers.
- **c.** If the flight is terminated by the examiner for any reason, only the flight movements that were not made in the first control are checked in the second control.
- **d.** Some flight maneuvers may be repeated at the examiner's discretion.
- **e.** If the examiner decides that no result can be obtained from the course of the flight at any stage of the flight (if the student cannot display a successful graphic), he may terminate the flight.
- **f.** In accordance with the helicopter flight manual, the student is responsible for the planning of the flight and the preparation of all necessary equipment and documents for the execution of the flight.
- **g.** The trainee will act in agreement with the examiner regarding the procedures determined in the relevant helicopter flight manual on issues such as power settings, speed, altitude selection.

1.9.2 Theoretical Knowledge

1.9.2.1 Progress Tests

Progress tests and insufficient development measures are explained in detail in 1.10 Effectiveness of Training, Section 1.10.4 and 1.10.5.

1.9.2.2 Theoretical Knowledge Exam (FCL.725, AMC1 FCL.725)

a. The student, who has completed the type rating theoretical knowledge training, is subjected to an exam on the theoretical course subjects specified in article 1.5.4.
b. The theoretical examination, which is the basis for obtaining a type of rating, is carried out by an examiner authorized by the General Directorate of Civil Aviation.
c. Exam questions are stored in computer environment and question bank. Before the exam, the questions selected by the relevant instructor are transferred to the exam paper. After the questions are answered by the student, the evaluation is made and the result passed on the exam result document.
d. Theoretical knowledge examination:

The applicant for a type rating shall pass a theoretical knowledge examination organized by the ATO to demonstrate the level of theoretical knowledge required for the safe operation of the applicable aircraft type.

(1) For multi-pilot helicopter, the theoretical knowledge examination shall be written and comprise at least 100 multiple-choice questions distributed appropriately across the main subjects of the syllabus.
(2) For single-pilot multi-engine aircraft, the theoretical knowledge examination shall be written, and the number of multiple-choice questions shall depend on the complexity of the aircraft.
(3) For single-engine aircraft, the theoretical knowledge examination shall be conducted verbally by the examiner during the skill test to determine whether or not a satisfactory level of knowledge has been achieved.
(4) At least 25 multiple-choice questions in annual license renewal trainings.
(5) Exam duration is two hours in type rating courses and one hour in annual license renewal training, wrong markings are not evaluated, and the success rate is at least 75%.

1.9.3 Authorization for Skill Test (FCL.030, FCL.1000, FCL.1010 FCL.1005.TRE FCL.1010.TRE)

a. The Type Rating Skill Test, which is required for students who have completed the helicopter type rating flight training, is performed by the examiners authorized by the General Directorate of Civil Aviation.
b. The theoretical knowledge exam that students who have completed the helicopter type rating theoretical training must take is given by the Theory Ground Course Instructor/Type Rating Flight Instructor (TRI-H/FI(H)) authorized by the General Directorate of Civil Aviation.
c. Flight progress tests and theoretical knowledge progress tests are conducted by KAAN AIR ATO examiners.

1.9.4 Rules Regarding Refresher Training to Be Applied Before Retesting (SHT-FCL Ek 1.9 C)

a. A student who fails the Type Rating Skill Test twice receives refresher flight training.
b. The content and amount of the refresher flight training is decided by the examiner authorized by the General Directorate of Civil Aviation.
c. The content and amount of the refresher theoretical knowledge training is decided by the examiner authorized by the General Directorate of Civil Aviation.

1.9.5 Skill Test Reports and Records (ORA.ATO.120, AMC1 ORA.ATO.120(a),(b))

a. Test reports and records are kept by the authorized examiner.
b. The originals of the test reports and records are sent to the General Directorate of Civil Aviation to form the basis for the type rating to be entered into the license.
c. A copy of the report and records are filed under the control of the Head of Training to be kept.
d. A sample of test reports and records is in Section-5 Appendices and Forms.
e. Theoretical knowledge and flight tests reports and records are shown in the table below.

CHECK REPORT AND RECORDS	APPENDIX NUMBER	FORM NUMBER
Single Pilot Helicopter Type Rating Application, Training/Skill Test and Proficiency Check Result Form	(APP-2)	TOF-01
FCL Type Rating Instructor – TRI(H) Application and Skills Test Result Form	(APP-3)	TOF-02

Theoretical Knowledge Course Exam Questions	-	-
Theoretical Knowledge Course Exam Answer Key	-	-
Theoretical Knowledge Course Exam Answer Sheet	-	-

1.9.6 Procedures for Preparation of Exam, Question Types and Evaluation (FCL.025, AMC1 FCL.025)

- **a.** Exam questions should be such that they measure information about the intended target. Therefore, the knowledge area and depth to be measured with each question should be fully defined.
- **b.** In exams, more questions should be asked on relatively important topics.
- **c.** Exam questions will be multiple choice type.
- **d.** The questions should be prepared about the main subject of the knowledge area, not in small details.
- **e.** Numerical questions should differ only in numerical values, not in the calculation method of the same field of knowledge. However, several examples of the same calculation methods should be available in the central question bank.
- **f.** Academic questions that have no practical application should be avoided unless they relate to the core concept.
- **g.** Abbreviations and synonyms should be used in known international norms. For example, for the angle of attack; Instead of α= 12°, it would be more appropriate to write angle of attack= 12 degrees.
- **h.** Questions and answers should be phrased as simply as possible. Exams are not a language test. Complex sentences, unconventional grammar rules and double negatives should be avoided.
- **i.** The question must contain a positively worded complete proposal. Incorrect answer choices should not differ significantly. Otherwise, the student can reach the correct answer by eliminating the dissimilar ones.
- **j.** The question must have only one correct answer.
- **k.** The correct answer must be unmistakably complete and complete. There should be no similar or surprising answers. When preparing a question, the main consideration should be how to answer the question quickly. This will not be possible if there is doubt.
- **l.** Incorrect answers should be reasonable in a way that even an unrelated person can easily understand. Each of the alternative answers should be relevant to the question, similar in grammatical structure and length.
- **m.** Exams should not exceed 2 hours, as it will cause fatigue and lead the student to make mistakes.
- **n.** The teacher who prepared the questions should calculate the estimated response time (approximately 1-2 minutes for each question). However, the response time may vary depending on the nature of the question.
- **o.** Documents and materials such as charts, cards, maps, calculators required to answer the question will be provided by ATO.
- **p.** Exam questions prepared as explained above are stored in a computer environment and in a question bank. Before the exam, the questions selected by the relevant teacher are transferred to the exam paper. After the questions are answered by the student, the evaluation is made and the result; passed on the exam result document.

1.9.6.1 Required Standards for Passing Exam (FCL.025)

- **a.** The theoretical knowledge exam passing standard is 75%.
- **b.** The flight test passing standard is as follows.
- **c.** The student must demonstrate the following flying abilities:
  - Flying the helicopter within its limits.
  - Smooth and accurate execution of all maneuvers.
  - Good judgment and aeronautical ability.
  - Sufficient aeronautical knowledge.
  - Ensure full control of the helicopter during flight procedures and maneuvers.
  - Understanding and applying crew cooperation and crew shortage procedures.
  - Effective communication with other flight attendants.
- **d.** The student must fly the helicopter within the following limits.

FCL Appendix-9, C – Special Requirements for Helicopter Category, Flight Test Tolerances.

1.9.6.2 VFR Flight Limits:

Altitude:

General : ± 100 feet

Heading:

Normal Condition : ± 5˚
Abnormal Condition/Emergency : ± 10˚

Airspeed

General : ± 10 knots
In simulated engine failure : + 10 knots / - 5 knots

Drift

On take-off, in ground effect : ± 3 feet
Landing : ± 2 feet (0 feet for fly back and forth)

1.9.6.3 IFR Flight Limits:

Altitude:

General : ± 100 feet
When a Go-around at Decision Altitude is initiated : + 50 feet / -0 feet
At Minimum Descent Height/Point/Altitude : + 50 feet / -0 feet

Track:

Navigation Equipment Tracking : ± 5˚
For angular changes : Half Dot (Lateral and Vertical)
2D or 3D Lateral Deviations : Error/deviation depending on the procedure ± ½ RNP value 1 time for a short time, deviation up to the RNP value is allowed
3B Vertical Deviations : No more than -75 feet below the vertical profile Aerodrome Altitude+1000ft--) Should not be more than +75 feet

Heading:

All Engine Operative : ± 5˚
In simulated engine failure : ± 10˚

Airspeed

All Engine Operative : ± 5 knots
In simulated engine failure : + 10 knots / - 5 knots

1.9.7 Question Analysis and Review Procedures for Re-Exam Paper Preparation

a. A new exam paper is prepared by the examiner for student who fails the Theoretical Knowledge training exam,

b. While preparing the re-exam paper, as in stated in chapter 1.9.2 and in the first exam; care is taken to ensure that it complies with the procedures specified in,

c. Questions are selected from the question bank,

d. The number of questions should be same as in the first exam,

e. Before the questions are selected, first exam of the student is carefully examined and care is taken to ensure that there is at least one each question about the subjects that he/she has failed.

1.9.8 Re-Exam Entry Procedures

1.9.8.1 Procedures for Retake Theoretical Knowledge Exam

a. Those who fail the theoretical exam take the exam again after at least 2 (two) days. This period can be increased if deemed necessary by the Head of Training.

b. The student who successfully passes the theoretical exam takes the type rating skill test for the flight test to complete the testing process.

c. The student who passes the theoretical exam must pass the flight test within 6 months. If he does not take or pass the flight test within this period.

1.9.8.2 Re-Flight Test Entry Procedures

a. The student taking the type rating skill test must be successful in all parts of the skill test form.

b. If the student fails more than 5 items, he retakes the entire skill test.

c. If the student fails less than 5 items, he or she is only tested on the failed items.

d. During the re-test, if the student fails again or fails again in the subjects in which he has been successful before, the whole skill test is re-tested.

e. All parts of the skill test must be completed within 6 months.

f. If the student fails the entire skill test twice, he or she must undergo additional training.

g. The amount and content of overtraining is determined by the examiner.

1.9.9 ATPL(H) (FCL SUBPART F SECTION 3, FCL.510.H, FCL.520.H)

1.9.9.1 ATPL(H) – Prerequisites, experience, and crediting

Applicants for an ATPL(H) shall:

(a) hold a CPL(H);

(b) have received instruction in MCC in accordance with point FCL.735.H;

(c) have completed as a pilot of helicopters a minimum of 1 000 hours of flight time including at least:

(1) 350 hours in multi-pilot operations in helicopters;

(2) (i) 250 hours as PIC; or

(ii) 100 hours as PIC and 150 hours as PIC under supervision; or

(iii) 250 hours as PIC under supervision in multi-pilot helicopters. In this case, the ATPL(H) privileges shall be limited to multi-pilot operations only, until 100 hours as PIC have been completed;

(3) 200 hours of cross-country flight time of which at least 100 hours shall be as PIC or as PIC under supervision;

(4) 30 hours of instrument time of which not more than 10 hours may be instrument ground time; and

(5) 100 hours of night flight as PIC or as co-pilot.

Of the 1 000 hours, a maximum of 100 hours may have been completed in an FSTD, of which not more than 25 hours may be completed in an FNPT;

(d) flight time in aeroplanes shall be credited up to 50 % against the flight time requirements of point (c);

(e) the experience required in point (c) shall be completed before the skill test for the ATPL(H) is taken;

(f) applicants for an ATPL(H) shall receive a full credit for the requirement in point (b) when they comply with point FCL.720.H(a)(2)(ii) and, additionally, have received training at an ATO to meet the necessary standard for the successful completion of the course as per point FCL.735.H.

1.9.9.2 ATPL(H) – Skill Test (FCL. 520.H ATPL(H))

Applicants for an ATPL(H) shall pass a skill test in accordance with Appendix 9 to SHT/Part-FCL to demonstrate the ability to perform as PIC of a multi-pilot helicopter the relevant procedures and maneuvers with the competency appropriate to the privileges granted.

The skill test shall be taken in the helicopter or an adequately qualified FFS representing the same type.

1.10 TRAINING EFFECTIVENESS

1.10.1 Individual Responsibilities

Flight and theoretical knowledge trainings are given within the framework of instructions, standards and rules set by KAAN AIR ATO.

a. Type rating training is carried out under the control and responsibility of the Head of Training.
b. The chief flight and chief theoretical knowledge instructor are accountable to the training manger.
c. The Head of Training and instructors closely follow the individual development of the student.
d. Necessary measures are taken immediately, depending on the education process and program, for the student, whose personal development is found to be defective.
e. Visual and written educational aids are utilized to the maximum for an effective education.

1.10.1.1 Head of Training

a. The Head of Training is responsible to the General Directorate of Civil Aviation for the adequate integration of the flight, theoretical knowledge, and synthetic trainings to be given, and for monitoring and following the individual progress of the candidates, and for KAAN AIR ATO to fulfill its obligations as per this instruction.
b. Responsible for the following issues in order to carry out the flight trainings to be given within the framework of the regulations, instructions and rules determined by the Authority, within the standards,
c. The execution of the training plan in accordance with the standards,
d. From the preparation of the training program for each course,
e. From the selection and training of teachers and examiners,
f. Ensuring the integration of flight and theoretical knowledge training,
g. From ensuring flight standardization.
h. Planning, monitoring and standardization of theoretical knowledge courses; making examinations, classifying and filing the results; Responsible for the integration of ground training with flight training.

1.10.1.2 Type Rating Instructor

Type Rating Flight Instructors are responsible to the training manager for the following issues.

a. Authorized instructions and standards; From the flight and theoretical knowledge trainings to be given to the candidates within the framework of the rules set by the Approved Training Organizations,
b. Adequate integration of flight and theoretical knowledge training.

1.10.1.3 Theoretical Knowledge Instructor

Theoretical Knowledge Instructors are responsible to the training manager for the place training to be given to the candidates, following the individual progress of the candidates, taking the necessary measures for their development.

1.10.2 General Evaluation

Flight and theoretical trainings are given within the framework of the instructions, standards and rules set by the Approved Type Rating Training Organization itself.

- Type rating training is carried out under the control and responsibility of the ATO Head of Training.
- Type rating flight instructor and theoretical knowledge instructor are responsible to the Head of Training.
- The Head of Training and instructors closely follow the individual development of the student.
- Necessary measures are taken immediately, depending on the education process and program, for the student, whose personal development is found to be defective.
- Between instructors and trainees in order to increase the quality of education and service at ATO and to measure satisfaction; a survey will be conducted at the end of the type rating courses. TOF-31 Instructor Evaluation Form will be used for the Survey (AMC1 ORA.ATO.230 (a)(10)(ii))

1.10.3 Inter-Departmental Coordination and Cooperation

a. Communication and coordination between departments is essential for a quality and effective training.
b. Ground lessons and flight training will be in an integration that supports each other.
c. For this purpose, theoretical training and flight training are planned by the Head of Training as integrated or modular depending on the situation.

d. The coordination between the type rating flight instructor and the theoretical knowledge instructor is provided by the Head of Training.

e. Liaison and coordination regarding the planning, execution, and finalization phases of type rating training activities; It will be between the Accountable Manager, the Compliance Monitoring Manager, the Head of Training, the Maintenance manager and the Accounting Manager. This liaison and coordination should be perceived as supporting training, which is the main activity.

1.10.4 Detection of Insufficient Development

In order to determine the student's theoretical knowledge education development, at the end of the main course subjects (limits, emergency procedures, etc.), development tests are made by the Theoretical Knowledge Instructor to teach critical subjects again.

1.10.5 Measures to Correct Insufficient Development

a. If the type rating flight instructor deems that the student cannot develop in parallel with the flight training program, he/she notifies the situation to the Head of Training.

b. In this case, the student is taken under spot control by the Head of Training or another instructor he/she will assign. At the end of the spot check, the Head of Training/or the new instructor and the Flight Instructor evaluate the student's condition.

c. At the end of the evaluation, they may decide to continue the planned flight training program or to take additional flight training to make up for the student's deficiencies.

d. The content and amount of additional flight training is decided jointly by the Head of Training/or the new instructor and the Flight Instructor.

e. Additional flight training should cover the student's weak areas of flight.

f. If the student fails the development tests at the end of the theoretical knowledge main topics (limits, emergency procedures, etc.), the theoretical knowledge instructor notifies the situation to the Head of Training.

g. The Head of Training and Theoretical Knowledge Instructor evaluate the student's situation. If they decide that the student is insufficient in theoretical knowledge, they decide to take additional training to complete their deficiencies.

h. The Education Manager and Theoretical Knowledge Instructor decide together on the content and amount of the additional education.

i. Additional education should cover the subjects in which the student is weak.

j. If the Head of Training, Flight Instructor and Theoretical Knowledge Instructor are convinced that the student has not made progress despite additional training, they can terminate the type rating course.

1.10.6 Instructor Replacement Procedures

a. During type rating flight training, instructor changes can be made if deemed necessary.

b. If the flight instructor feels a lack of communication, a disconnection between himself and his student during the training process and thinks that he is not useful to his student, he may request a instructor change.

c. The student can request a change of instructor.

d. If the Head of Training evaluates these requests and evaluates that the instructor is not useful to the student as a result of the monitoring and control, he has made, he can change the instructor.

1.10.7 Number of Instructors Each Student Can Change

The student can change the instructor for a maximum of 2 times during the type rating flight training. This number can be increased, if deemed necessary, by the decision of the Head of Training.

1.10.8 Internal Feedback System to Detect Failures in Education

a. Feedback is applied at every training hour in order to detect any malfunctions that may occur in flight and theoretical training.

b. In each flight training period, some important flight movements learned before are repeated and the condition of the student is observed.

c. If there is a problem, the shortcomings are corrected with short feedback trainings done during the training hour.

d. During each theoretical lesson, the situation of the student is observed by asking short questions about some important previously learned topics

1.10.9 Procedures for Weaning a Student Off from Flight Training

a. When it is understood that the student does not comply with the starting conditions stated in article 1.2 or loses these conditions, the student is dismissed from the course.
b. If the student engages in undisciplined and dangerous behaviors that disrupt the course order and violate safety, and persists in these behaviors, he or she will be dismissed from the course.
c. The student is dismissed from the course when he/she completes the following process due to his/her inadequacy in education.
1) The student, who is deemed inadequate by the flight training instructor, is taken to point control by the Head of Training.
2) At the end of the control, it is decided that the student will continue the planned flight training program or take additional flight training to complete his deficiencies.
3) If it is concluded that the student has not reached the standards even though he has received additional flight training twice, he is dismissed from the course.
d. The student's dismissal from the course is subject to the decision of the KAAN AIR ATO Education Board.
e. KAAN AIR ATO Education Board; It consists of the Accountable Manager, the Head of Training, the Flight Instructor and the Theoretical Knowledge Instructor.

1.10.10 / 1.10.11 Discipline, Reporting and Documentation (ORA.ATO.120)

a. Before starting the type rating training, the Head of Training is notified to the General Directorate of Civil Aviation by stating the nature and duration of the course and the identities of the participants.
b. During the type rating training, the records and documents specified in article 1.6.3 are duly kept.
c. A Course Completion Certificate (Appendix-4) is given to the student who has completed the type rating training. The end of the training is notified to the TR DGCA by the Head of Training together with the course result report.
d. Records and documents are kept for 3 years.

1.11 PERFORMANCE LEVELS AND STANDARDS FOR EVERY STAGE

1.11.1 Personal Responsibilities

1.11.1.1 Head of Training

a. It is responsible for the execution of the flight trainings to be given within the framework of the regulations, instructions and rules determined by the authority within the standards.
b. It is responsible for the follow-up and supervision of the planning, execution, and control stages necessary for the student to reach type rating training standards and maintain their quality in the general flight environment.
c. It is responsible for maintaining the standards of flight instructors and making the necessary follow-ups and controls for the students to be trained in accordance with the standards.
d. It is responsible for the development of theoretical knowledge instructors and for making necessary follow-ups and controls for the students to grow up in accordance with the theoretical standards.

1.11.1.2 Type Rating Instructor

a. Responsible for the flight and theoretical training to be given to the candidates within the framework of the instructions and standards determined by the Authority and the rules set by the Approved Training Organizations.
b. Responsible for teaching the maneuvers in the course content and making every effort in this regard so that his student can reach type rating training standards.

1.11.1.3 Theoretical Knowledge Instructor

a. Theoretical knowledge instructors are responsible to the Head of Training for the ground training to be given to the candidates, following the individual progress of the candidates, taking the necessary measures for their development.

b. Responsible for teaching students' theoretical subjects in accordance with the plan written in the course program and ensuring that they achieve at least the minimum desired standards.

1.11.2 Standardization

a. To complete the type rating training course, the student must have reached the standards beyond any doubt.

b. These are the minimum standards; more success should be aimed and the execution of the maneuver with zero error should be aimed.

c. When assessing the student's standard, his or her skill in flight and ground safety should be particularly monitored.

d. The student should have a good command of especially emergency procedures.

1.11.3 Standardization Terms and Procedures

a. In reaching the standards, APPROVED TRAINING ORGANIZATION, instructor and student should cooperate.

b. Both the theory and the flight programs of the course were arranged in such a way as to bring the student to the required standard at the end of the course.

c. To achieve this standard, both teacher and student, the content of the course program will be carried out under the control of the Head of Training.

d. The trainee is trained to reach the standards specified for each maneuver in the Rotorcraft Flight Manual (RFM) of the relevant helicopter.

1.11.4 Application of Test Criteria

At the end of the Type Rating Training Course, whether the student has reached the required standards will be determined by the flight control of the TRE authorized by TR DGCA.

1.11.5 Principles to be Applied in Case of Suspension of Flight Training

a. The flight training phases of type rating courses are generally of short duration. In case the trainee takes a break from the flight during the flight training process, the trainings should be planned by dividing them into phases to simplify the need for renewal. However, if the course is interrupted due to compelling reasons before a stage is completed, the next stage can be continued, provided that 3 landing and take-offs in the last 90 days. For the trainee who does not meet this requirement, 1 period of flight training including three take-offs and landings is planned.

b. In all the courses, it is planned to meet the requirement of having 3 take-offs and landings in the last 90 days, which is the Recent Experience (FCL.060) requirement.

c. If the courses are not completed within 6 months, **ground training is repeated**.

BRIEFING AND FLIGHT MANEUVERS (A119)

2.A119. BRIEFING AND FLIGHT MANEUVERS

2.A119.1 FLIGHT MAVEUVERS

2.A119. BRIEFING AND FLIGHT MANEUVERS

2.A119.1 FLIGHT MAVEUVERS

STRAIGHT-and-LEVEL FLIGHT

STANDARDS

- Airspeed: 100 KT ± 5 KT.
- Altitude: ±50 Feet
- Heading: ± 10°

DEFINITION

Straight-and-level flight is flight in which constant altitude and heading are maintained. The attitude of the rotor disk relative to the horizon determines the airspeed (100Kt). The horizontal stabilizer design determines the helicopter's attitude when stabilized at an airspeed and altitude. Altitude is primarily controlled by use of the collective.

TECHNIQUE

To maintain forward flight, the rotor tip-path plane must be tilted forward to obtain the necessary horizontal thrust component from the main rotor. By doing this, it causes the nose of the helicopter to lower which in turn will cause the airspeed to increase. In order to counteract this, the pilot must find the correct power setting to maintain level flight by adjusting the collective. The horizontal stabilizer aids in trimming the helicopter longitudinally and reduces the amount of nose tuck that would occur. On several helicopters, it is designed as a negative lift airfoil, which produces a lifting force in a downward direction.

When in straight-and-level flight, any increase in the collective, while holding airspeed constant, causes the helicopter to climb. A decrease in the collective, while holding airspeed constant, causes the helicopter to descend. A change in the collective requires a coordinated change of the throttle to maintain a constant rpm. Additionally, the antitorque pedals need to keep the helicopter in trim around the vertical axis. In general, in level flight, the right pedal is slightly ahead, and when power changes are required, the pedal is used in a coordinated manner in order to maintain the parallelism of the fuselage with the flight direction.

The predetermined leveling torque may be too much or insufficient to maintain the altitude. Altitude changes of 100 feet or less are compensated by increasing or decreasing the speed by 10 Kt.

To increase airspeed in straight-and-level flight, apply forward pressure on the cyclic and raise the collective as necessary to maintain altitude. To decrease airspeed, apply rearward pressure on the cyclic and lower the collective, as necessary, to maintain altitude.

Although the cyclic is sensitive, there is a slight delay in control reaction, and it is necessary to anticipate Actual movement of the helicopter. When making cyclic inputs to control the altitude or airspeed of a helicopter, take care not to overcontrol. If the nose of the helicopter rises above the level-flight attitude, apply forward pressure to the cyclic to bring the nose down. If this correction is held too long, the nose drops too low. Since the helicopter continues to change attitude momentarily after the controls reach neutral, return the cyclic to neutral slightly before the desired attitude is reached. This principle holds true for any cyclic input.

Since helicopters are not very stable, but are inherently very controllable, if a gust or turbulence causes the nose to drop, the nose tends to continue to drop instead of returning to a straight-and-level attitude as it would on a fixed-wing aircraft. Therefore, a pilot must remain alert and fly the helicopter at all times. If a sideways drift is observed in the helicopter due to the side wind, the cyclic control opens into the wind. In proportion to the wind force, the head is turned into the wind and the cyclic control is brought back to its initial position, crab is given, and the helicopter is trimmed.

COMMON ERRORS

- Failure to trim the helicopter properly, tending to hold antitorque pedal pressure and opposite cyclic. This is commonly called cross-controlling.
- Failure to maintain desired airspeed.
- Failure to hold proper control position to maintain desired ground track.
- Failure to allow helicopter to stabilize at new airspeed.

TURNS

STANDARDS

- Airspeed: 100 KT ± 5 KT.
- Altitude: ±50 Feet
- Bank Angle: 15 º ± 5 º
- Rolling out of the turn: ± 5

DEFINITION

A turn is a maneuver used to change the heading of the helicopter.

TECHNIQUE

Before beginning any turn, the area in the direction of the turn must be cleared not only at the helicopter's altitude, but also above and below. To enter a turn from straight-and-level flight, apply sideward pressure on the cyclic in the direction the turn is to be made. This is the only control movement needed to start the turn. Do not use the pedals to assist the turn. Use the pedals only to compensate for torque to keep the helicopter in trim around the vertical axis. Keeping the fuselage in the correct streamlined position around the vertical axis facilitates the helicopter flying forward with the least drag. Trim is indicated by a yaw string in the center, or a centered ball on a turn and slip indicator.

Turning maneuvers in flight are performed with a standard banked turn (15 degrees) and by changing the head direction 180 degrees, unless otherwise stated. While checking the cleanliness of the area to be turned, some landmarks are selected in the 90-degree turn direction, which can be the reference point for completing the turn. Wind direction and intensity are determined.

How fast the helicopter bank depends on how much lateral cyclic pressure is applied. How far the helicopter bank (the steepness of the bank) depends on how long the cyclic is displaced. After establishing the proper bank angle, return the cyclic toward the neutral position. When the bank is established, returning the cyclic to neutral or holding it inclined relative to the horizon will maintain the helicopter at that bank angle. Increase the collective and throttle to maintain altitude and rpm. As the torque increases, increase the proper antitorque pedal pressure to maintain longitudinal trim. Depending on the degree of bank, additional forward cyclic pressure may be required to maintain airspeed.

Rolling out of the turn to straight-and-level flight is the same as the entry into the turn except that pressure on the cyclic is applied in the opposite direction. 5 - 10 degrees before the selected reference line for exit from the turn, the cyclic is tilted to the opposite side and the exit from the turn command is given. Since the helicopter continues to turn as long as there is any bank, start the rollout before reaching the desired heading.

SLIPS

A slip occurs when the helicopter slides sideways toward the center of the turn. It is caused by an insufficient amount of antitorque pedal in the direction of the turn, or too much in the direction opposite the turn, in relation to the amount of power used. In other words, if you hold improper antitorque pedal pressure,

which keeps the nose from following the turn, the helicopter slips sideways toward the center of the turn.

SKIDS

A skid occurs when the helicopter slides sideways away from the center of the turn. It is caused by too much antitorque pedal pressure in the direction of the turn, or by too little in the direction opposite the turn in relation to the amount of power used. If the helicopter is forced to turn faster with increased pedal pressure instead of by increasing the degree of the bank, it skids sideways away from the center of the turn instead of flying in its normal curved path.

In summary, a skid occurs when the rate of turn is too great for the amount of bank being used, and a slip occurs when the rate of turn is too low for the amount of bank being used.

COMMON ERRORS

- Failure to maintain altitude.
- Failure to hold airspeed and heading.
- Causing slips and skids.
- Failure to maintain bank angle.
- Failure to roll out at desired heading.

ALTITUDE CHANGES CLIMBING AND DESCENDING

STANDARDS

- Airspeed: 75 Kt ± 5 Kt.
- Heading: ± 5 º
- Transition to Level Flight: ±50 Feet

NORMAL CLIMB

The entry into a climb from a hover has already been described in the Normal Takeoff from a Hover subsection; therefore, this discussion is limited to a climb entry from cruising flight.

TECHNIQUE

For training purposes, a climb rate of 75 Kt and a rate of 500 fpm are used. To enter a climb in a helicopter while maintaining airspeed, the first actions are increasing the collective and throttle, and adjusting the pedals as necessary to maintain a centered ball in the slip/skid indicator. Moving the collective up requires a slight aft movement of the cyclic to direct all of the increased power into lift and maintain the airspeed. Remember, a helicopter can climb with the nose down and descend with the nose up. Helicopter attitude changes mainly reflect acceleration or deceleration, not climb or descent. Therefore, the climb attitude is approximately the same as level flight in a stable climb, depending on the aircraft's horizontal stabilizer design.

If the pilot wishes to climb faster, with a decreased airspeed, then the climb can be initiated with aft cyclic. Depending on initial or entry airspeed for the climb, the climb can be accomplished without increasing the collective, if a much slower airspeed is acceptable. However, as the airspeed decreases, the airflow over the vertical fin decreases necessitating more antitorque (left) pedal application.

To level off from a climb, start adjusting the attitude to the level flight attitude a few feet prior to reaching the desired altitude. The amount of lead depends on the rate of climb at the time of level-off (the higher the rate of climb, the more the lead). Generally, the lead is 10 percent of the climb rate. For example, if the climb rate is 500 feet per minute (fpm), you should lead the level-off by 50 feet.

To begin the level-off, apply forward cyclic to adjust and maintain a level flight attitude, which can be slightly nose low. Maintain climb power until the airspeed approaches the desired cruising airspeed, then lower the collective to obtain cruising power and adjust the throttle to obtain and maintain cruising rpm. Throughout the level-off, maintain longitudinal trim with the antitorque pedals.

COMMON ERRORS

1. Failure to maintain proper power and airspeed.
2. Holding too much or too little antitorque pedal.
3. In the level-off, decreasing power before adjusting the nose to cruising attitude.
4. Failure to maintain Ground Track.

NORMAL DESCENT

A normal descent is a maneuver in which the helicopter loses altitude at a controlled rate in a controlled attitude.

TECHNIQUE

For training purposes, a descent speed of 75 Kt and a descent rate of 500 fpm are used. To establish a normal descent from straight-and-level flight at cruising airspeed, lower the collective to obtain proper power, adjust the throttle to maintain rpm, and increase right antitorque pedal pressure to maintain heading in a counterclockwise rotor system, or left pedal pressure in a clockwise system. If cruising airspeed is the same as or slightly above descending airspeed, simultaneously apply the necessary cyclic pressure to obtain the approximate descending attitude. If the pilot wants to decelerate, the cyclic must be moved aft. If the pilot desires to descend with increased airspeed, then forward cyclic is all that is required if airspeed remains under the limit. As the helicopter stabilizes at any forward airspeed, the fuselage attitude will streamline due to the airflow over the horizontal stabilizer. As the airspeed changes, the airflow over the vertical stabilizer or fin changes, so the pedals must be adjusted for trim.

The pilot should always remember that the total lift and thrust vectoring is controlled by the cyclic. If a certain airspeed is desired, it will require a certain amount of cyclic and collective movement for level flight. If the cyclic is moved, the thrust-versus-lift ration is changed. Aft cyclic directs more power to lift, and altitude increases. Forward cyclic directs more power to thrust, and airspeed increases. If the collective is not changed and there is a change only in cyclic, the total thrust to lift ration does not change, aft cyclic results in a climb, and forward cyclic results in a descent with the corresponding airspeed changes.

To level off from the descent, lead the desired altitude by approximately 10 percent of the rate of descent. For example, a 500-fpm rate of descent would require a 50-foot lead. At this point, increase the collective to obtain cruising power, adjust the throttle to maintain rpm, and increase left antitorque pedal pressure to maintain heading (right pedal pressure in a clockwise rotor system). Adjust the cyclic to obtain cruising airspeed and a level flight attitude as the desired altitude is reached.

COMMON ERRORS

1. Failure to maintain constant angle of decent during training.
2. Failure to level-off the aircraft sufficiently, which results in recovery below the desired altitude.
3. Failure to adjust antitorque pedal pressures for changes in power.
4. Failure to maintain Ground Track.

TURNS WHILE CLIMBING OR DESCENDING

STANDARDS

- Airspeed: 75 Kt ± 5 Kt.
- Roll out to level flight: ± 50 Feet / ± 5 º
- Heading: ± 5 º
- Bank Angle: 15 º ± 5 º
- Rate of descent and climb: ± 500 feet/min

TECHNIQUE

For training purposes, 500 feet of altitude and 180 degrees of direction changes are made during these maneuvers. The discussion on level turns is equally applicable to making turns while climbing or descending. The only difference is that the helicopter is in a climbing or descending attitude rather than that of level flight. If a simultaneous entry is desired, merely combine the techniques of both maneuvers— climb or descent entry and turn entry. When recovering from a climbing or descending turn, the desired heading and altitude are rarely reached at the same time. If the heading is reached first, stop the turn and maintain the climb or descent until reaching the desired altitude. On the other hand, if the altitude is reached first, establish the level flight attitude, and continue the turn to the desired heading.

COMMON ERRORS

- Failure to do the Descent/Climb simultaneously with the turn.
- Not being able to adjust the Descent/Climb power.
- Inability to maintain bank angle and airspeed.

VERTICAL TAKEOFF TO A HOVER

STANDARDS

- Heading: ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting: 1 foot

DEFINITION

A vertical takeoff to a hover involves flying the helicopter from the ground vertically to a skid height of two to three feet, while maintaining a constant heading. Once the desired skid height is achieved, the helicopter should remain nearly motionless over a reference point at a constant altitude and on a constant heading. The maneuver requires a high degree of concentration and coordination.

TECHNIQUE

The pilot on the controls needs to clear the area left, right, and above to perform a vertical takeoff to a hover. The pilot should remain focused outside the aircraft and obtain clearance to take off from the controlling tower. If necessary, the pilot who is not on the controls assists in clearing the aircraft and provides adequate warning of any obstacles and any unannounced or unusual drift/altitude changes.

Heading control, direction of turn, and rate of turn at hover are all controlled by using the pedals. Hover height, rate of ascent, and the rate of descent are controlled by using the collective. Helicopter position and the direction of travel are controlled by the cyclic.

After receiving the proper clearance and ensuring that the area is clear of obstacles and traffic, begin the maneuver with the collective in the down position and the cyclic in a neutral position, or slightly into the wind. Very slowly increase the collective until the helicopter becomes light on the skids or wheels. At the same time apply pressure and counter pressure on the pedals to ensure the heading remains constant. Continue to apply pedals as necessary to maintain heading and coordinate the cyclic for a vertical ascent. As the helicopter slowly leaves the ground, check for proper attitude control response and helicopter center of gravity. A slow ascent will allow stopping if responses are outside the normal parameters indicating hung or entangled landing gear, center of gravity problems, or control issues. If a roll or tilt begin, decrease the collective and determine the cause of the roll or tilt. Upon reaching the desired hover altitude (3 feet), adjust the flight controls as necessary to maintain position over the intended hover area. Student pilots should be reminded that while at a hover, the helicopter is rarely ever level. Helicopters usually hover left side low due to the tail rotor thrust being counteracted by the main rotor tilt. A nose low or high condition is generally caused by loading. Once stabilized, check the engine instruments and note the power required to hover.

Excessive movement of any flight control requires a change in the other flight controls. For example, if the helicopter drifts to one side while hovering, the pilot naturally moves the cyclic in the opposite direction. When this is done, part of the vertical thrust is diverted, resulting in a loss of altitude. To maintain altitude, increase the collective. These increases drag on the blades and tends to slow them down. To counteract the drag and maintain rpm, increase the throttle. Increased throttle means increased torque, so the pilot must add more pedal pressure to maintain the heading. This can easily lead to overcontrolling the helicopter. However, as level of proficiency increases, problems associated with overcontrolling decrease. Helicopter controls are usually more driven by pressure than by gross control movements.
WARNING: In order to prevent "DYNAMIC ROLLOVER" that can occur very quickly in case of lightening, backward and sideways movements should be avoided. If a backward and sideways movement begins, the collective is reduced without delay and the movement is resumed.
WARNING: Due to the fact that the tail damper is very close to the ground, it should be avoided to turn too much backwards when taking off.

COMMON ERRORS
1. Failing to ascend vertically as the helicopter becomes airborne.
2. Pulling excessive collective to become airborne, causing the helicopter to gain too much altitude.
3. Overcontrolling the antitorque pedals, which not only changes the heading of the helicopter, but also changes the rpm.
4. Reducing throttle rapidly in situations in which proper rpm has been exceeded, usually resulting in exaggerated heading changes and loss of lift, resulting in loss of altitude.
5. Failing to ascend slowly.

HOVERING

Hovering is a maneuver in which the helicopter is maintained in nearly motionless flight over a reference point at a constant altitude and on a constant heading.

TECHNIQUE

To maintain a hover over a point, use sideview and peripheral vision to look for small changes in the helicopter's attitude and altitude. When these changes are noted, make the necessary control inputs before the helicopter starts to move from the point. To detect small variations in altitude or position, the main area of visual attention needs to be some distance from the aircraft, using various points on the helicopter or the tip-path plane as a reference. Looking too closely or looking down leads to overcontrolling. Obviously, in order to remain over a certain point, know where the point is, but do not focus all attention there.

As with a takeoff, the pilot controls altitude with the collective and maintains a constant rpm with the throttle. The cyclic is used to maintain the helicopter's position; the pedals, to control heading. To maintain the helicopter in a stabilized hover, make small, smooth, coordinated corrections. As the desired effect occurs, remove the correction in order to stop the helicopter's movement. For example, if the helicopter begins to move rearward, apply a small amount of forward cyclic pressure. However, neutralize this pressure just before the helicopter comes to a stop, or it will begin to move forward.

After experience is gained, a pilot develops a certain "feel" for the helicopter. Small deviations can be felt and seen, so you can make the corrections before the helicopter actually moves. A certain relaxed looseness develops, and controlling the helicopter becomes second nature, rather than a mechanical response.

COMMON ERRORS

1. Tenseness and slow reactions to movements of the helicopter.
2. Failure to allow for lag in cyclic and collective pitch, which leads to overcontrolling. It is very common for a student to get ahead of the helicopter. Due to inertia, it requires some small time period for the helicopter to respond.
3. Confusing attitude changes for altitude changes, which results in improper use of the controls.
4. Hovering too high, creating a hazardous flight condition. The height velocity chart should be referenced to determine the maximum skid height to hover and safely recover the helicopter should a malfunction occur.
5. Hovering too low, resulting in occasional touchdown.
6. Becoming overly confident over prepared surfaces when taking off to a hover. Be aware that dynamic rollover accidents usually occur over a level surface.

LANDING FROM HOVERING

STANDARDS

- Hover Height: 3 feet AGL
- Heading: ± 10 º
- Drifting Forward: 1 foot
- Drifting sideways and backwards is not allowed.

DEFINITION

Once the initials are established, from a 3 feet fixed hover state, the collective is gently pressed down to establish a smooth and sustained rate of descent. Considering the reference line passing through two selected points 50 – 75 feet ahead of the helicopter, the initial deviations are prevented by small pedal controls, and the drifting and forward and backward movements of the fuselage are prevented by small cyclic controls.

Do not look directly in front of the helicopter in order to avoid mistakes and therefore excessive control applications. A decreasing trend in approaching ground can be felt due to the ground effect about 1 foot from the ground. In this case, the collective is continued to be decreased so that the initial rate of descent is achieved. It should be noted that first the left/right skid (wheel) and then the right/left skid (wheel) will touch the ground, since the helicopter body is tilted to the left/right on the hover. While the skids/wheels are touching the ground, all movements of the helicopter are prevented by cyclic and pedals, and the collective is pressed down softly.

COMMON ERRORS

- Sudden decreasing or intermittent use of the collective,
- Allowing deviations and drifts,
- Too much and unnecessary playing with the controllers.

HOVERING—FORWARD FLIGHT, TAXI

STANDARDS

- Heading ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting: ± 1 feet

DEFINITION

Forward hovering flight is normally used to move a helicopter to a specific location, and it may begin from a stationary hover. During the maneuver, constant groundspeed, altitude, and heading should be maintained.

TECHNIQUE

Before starting, pick out two references directly in front and in line with the helicopter. These reference points should be kept in line throughout the maneuver. Begin the maneuver from a normal hovering altitude (3 feet) by applying forward pressure on the cyclic. As movement begins, return the cyclic toward the neutral position to maintain low groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain a constant groundspeed and path over the ground with the cyclic, a constant heading with the antitorque pedals, altitude with the collective, and the proper rpm with the throttle.

To stop the forward movement, apply rearward cyclic pressure until the helicopter stops. As forward motion stops, return the cyclic to the neutral position to prevent rearward movement. Forward movement can also be stopped by simply applying rearward pressure to level the helicopter and allowing it to drift to a stop.

COMMON ERRORS

1. Exaggerated movement of the cyclic, resulting in erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to maintain alignment with direction of travel.

TAXIING

Taxiing refers to operations on or near the surface of taxiways or other prescribed routes. Helicopters utilize three different types of taxiing.

HOVER TAXI

A hover taxi is used when operating below 25 feet above ground level (AGL). Since hover taxi is just like forward, sideward, or rearward hovering flight, the technique to perform it is not presented here.

AIR TAXI

An air taxi is preferred when movements require greater distances within an airport or heliport boundary. In this case, fly to the new location; however, it is expected that the helicopter will remain below 100 feet AGL with an appropriate airspeed and will avoid over flight of other aircraft, vehicles, and personnel.

TECHNIQUE

Before starting, determine the appropriate airspeed and altitude combination to remain out of the cross-hatched or shaded areas of the height-velocity diagram. Additionally, be aware of crosswind conditions that could lead to loss of tail rotor effectiveness. Pick out two references directly in front of the helicopter for the ground path desired. These reference points should be kept in line throughout the maneuver.

Begin the maneuver from a normal hovering altitude by applying forward pressure on the cyclic. As movement begins, attain the desired airspeed with the cyclic. Control the desired altitude with the collective and rpm with the throttle. Throughout the maneuver, maintain a desired groundspeed and ground track with the cyclic, a constant heading with antitorque pedals, the desired altitude with the collective, and proper operating rpm with the throttle.

To stop the forward movement, apply aft cyclic pressure to reduce forward speed. Simultaneously lower the collective to initiate a descent to hover altitude. As forward motion stops, return the cyclic to the neutral position to prevent rearward movement. As approaching the proper hover altitude, increase the collective as necessary to stop descent at hover altitude (much like a quick stop maneuver).

COMMON ERRORS

1. Erratic movement of the cyclic, resulting in improper airspeed control and erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired altitude.
4. Failure to maintain proper rpm.
5. Overflying parked aircraft causing possible damage from rotor downwash.
6. Flying in the cross-hatched or shaded area of the height-velocity diagram.
7. Flying in a crosswind that could lead to loss of tail rotor effectiveness.
8. Excessive tail-low attitudes.
9. Excessive power used or required to stop.
10. Failure to maintain alignment with direction of travel.

SURFACE TAXI

A surface taxi is used to minimize the effects of rotor downwash. Avoid excessive cyclic displacement while surface taxiing or on the ground which can lead to main rotor blades contacting the helicopter or rotor mast. This technique may be used with wheeled aircraft, or with those that have floats, skids or skis.

TECHNIQUE

The helicopter should be in a stationary position on the surface with the collective full down and the rpm the same as that used for a hover. This rpm should be maintained throughout the maneuver. Then, move the cyclic slightly forward and apply gradual upward pressure on the collective to move the helicopter forward along the surface. Use the antitorque pedals to maintain heading and the cyclic to maintain ground track. The collective controls starting, stopping, and speed while taxiing. The higher the collective pitch, the faster the taxi speed; however, do not taxi faster than a brisk walk. If the helicopter is equipped with brakes, use them to help slow down. Do not use the cyclic to control groundspeed.

During a crosswind taxi, hold the cyclic into the wind a sufficient amount to eliminate any drifting movement.

COMMON ERRORS

1. Improper use of cyclic.
2. Failure to use antitorque pedals for heading control.
3. Improper use of the controls during crosswind operations.
4. Failure to maintain proper rpm.

HOVERING TURN

STANDARDS

- Hover Height: 3 feet AGL ± 1 feet
- Rate of Turn: 90 º turn in 4 second.
- Drifting: 1 foot

DEFINITION

A hovering turn is a maneuver performed at hovering altitude in which the nose of the helicopter is rotated either left or right while maintaining position over a reference point on the surface. Hovering turns can also be made around the mast or tail of the aircraft. The maneuver requires the coordination of all flight controls and demands precise control near the surface. A pilot should maintain a constant altitude, rate of turn, and rpm. (4 sec for a 90 degree turn)

TECHNIQUE

Initiate the turn in either direction by applying anti-torque pedal pressure toward the desired direction. It should be noted that during a turn to the left, more power is required because left pedal pressure increases the pitch angle of the tail rotor, which, in turn, requires additional power from the engine. A turn to the right requires less power. (On helicopters with a clockwise rotating main rotor, right pedal increases the pitch angle and, therefore, requires more power.)

As the turn begins, use the cyclic as necessary (usually into the wind) to keep the helicopter over the desired spot. To continue the turn, add more pedal pressure as the helicopter turns to the crosswind position. This is because the wind is striking the tail surface and tail rotor area, making it more difficult for the tail to turn into the wind. As pedal pressures increase due to crosswind forces, increase the cyclic pressure into the wind to maintain position. Use the collective with the throttle to maintain a constant altitude and rpm.

After the 90° portion of the turn, decrease pedal pressure slightly to maintain the same rate of turn. Approaching the 180°, or downwind portion, anticipate opposite pedal pressure due to the tail moving from an upwind position to a downwind position. At this point, the rate of turn has a tendency to increase at a rapid rate due to the tendency of the tail surfaces to weathervane. Because of the tailwind condition, hold rearward cyclic pressure to keep the helicopter over the same spot.

The horizontal stabilizer has a tendency to lift the tail during a tailwind condition. This is the most difficult portion of the hovering turn. Horizontal and vertical stabilizers have several different designs and locations, including the canted stabilizers used on some Hughes and Schweizer helicopters. The primary purpose of the vertical stabilizer is to unload the work of the antitorque system and to aid in trimming the helicopter in flight should the antitorque system fail. The horizontal stabilizer provides for a more usable CG range and aids in trimming the helicopter longitudinally.

Because of the helicopter’s tendency to weathervane, maintaining the same rate of turn from the 180° position actually requires some pedal pressure opposite the direction of turn. If a pilot does not apply opposite pedal pressure, the helicopter tends to turn at a faster rate. The amount of pedal pressure and cyclic deflection throughout the turn depends on the wind velocity. As the turn is finished on the upwind heading, apply opposite pedal pressure to stop the turn. Gradually apply forward cyclic pressure to keep the helicopter from drifting.

Control pressures and direction of application change continuously throughout the turn. The most dramatic change is the pedal pressure (and corresponding power requirement) necessary to control the rate of turn as the helicopter moves through the downwind portion of the maneuver.

Turns can be made in either direction; however, in a high wind condition, the tail rotor may not be able to produce enough thrust, which means the pilot cannot control a turn to the right in a counterclockwise rotor system. Therefore, if control is ever questionable, first attempt to make a 90° turn to the left. If sufficient tail rotor thrust exists to turn the helicopter crosswind in a left turn, a right turn can be successfully controlled. The opposite applies to helicopters with clockwise rotor systems. In this case, start the turn to the right. Hovering turns should be avoided in winds strong enough to preclude sufficient aft cyclic control to maintain the helicopter on the selected surface reference point when headed downwind. Check the flight manual for the manufacturer’s recommendations for this limitation.

COMMON ERRORS

1. Failing to maintain a slow, constant rate of turn.
2. Failing to maintain position over the reference point.
3. Failing to maintain rpm within normal range.
4. Failing to maintain constant altitude.
5. Failing to use the antitorque pedals properly.

HOVERING—SIDEWARD FLIGHT

STANDARDS

- Heading: ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting Rearward: ± 2 feet

DEFINITION

Sideward hovering flight may be necessary to move the helicopter to a specific area when conditions make it impossible to use forward flight. During the maneuver, a constant groundspeed, altitude, and heading should be maintained.

TECHNIQUE

Before starting sideward hovering flight, ensure the area for the hover is clear, especially at the tail rotor. (With a 90-degree cleaning turn) Constantly monitor hover height and tail rotor clearance during all hovering maneuvers to prevent dynamic rollover or tail rotor strikes to the ground. Then, pick two points of in-line reference in the direction of sideward hovering flight to help maintain the proper ground track. These reference points should be kept in line throughout the maneuver.

Begin the maneuver from a normal hovering altitude by applying cyclic toward the side in which the movement is desired. As the movement begins, return the cyclic toward the neutral position to maintain low groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain a constant groundspeed and ground track with cyclic. Maintain heading, which in this maneuver is perpendicular to the ground track, with the antitorque pedals, and a constant altitude with the collective. Use the throttle to maintain the proper operating rpm. Be aware that the nose tends to weathervane into the wind. Changes in the pedal position will change the rpm and must be corrected by collective and/or throttle changes to maintain altitude.

To stop the sideward movement, apply cyclic pressure in the direction opposite to that of movement and hold it until the helicopter stops. As motion stops, return the cyclic to the neutral position to prevent movement in the opposite direction. Applying sufficient opposite cyclic pressure to level the helicopter may also stop sideward movement. The helicopter then drifts to a stop.

COMMON ERRORS

1. Exaggerated movement of the cyclic, resulting in overcontrolling and erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to make sure the area is clear prior to starting

HOVERING—REARWARD FLIGHT

STANDARDS

- Heading: ± 10 °
- Hover Height: 10 feet AGL (± 1 feet)
- Drifting: 1 foot

DEFINITION

Rearward hovering flight may be necessary to move the helicopter to a specific area when the situation is such that forward or sideward hovering flight cannot be used. During the maneuver, maintain a constant groundspeed, altitude, and heading. Due to the limited visibility behind a helicopter, it is important that the area behind the helicopter be cleared before beginning the maneuver. Use of ground personnel is recommended.

TECHNIQUE

Before starting rearward hovering flight, pick out two reference points in front of, and in line with the helicopter just like hovering forward. The movement of the helicopter should be such that these points remain in line.

Begin the maneuver from a normal hovering altitude (10 feet) by applying rearward pressure on the cyclic. After the movement has begun, position the cyclic to maintain a slow groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain constant groundspeed and ground track with the cyclic, a constant heading with the antitorque pedals, constant altitude with the collective, and the proper rpm with the throttle.

To stop the rearward movement, apply forward cyclic and hold it until the helicopter stops. As the motion stops, return the cyclic to the neutral position. Also, as in the case of forward and sideward hovering flight, opposite cyclic can be used to level the helicopter and let it drift to a stop. Tail rotor clearance must be maintained. Generally, a higher-than normal hover altitude is preferred.

COMMON ERRORS

1. Exaggerated movement of the cyclic resulting in overcontrolling and an uneven movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to make sure the area is clear prior to starting the maneuver.

HOVER OGE (OUT OF GROUND EFFECT) CHECK

STANDARDS

- Drift: ±10 Ft.
- Establishing a hover altitude at 100 Feet or above surrounding obstacles.
- Heading: ±10°
- Maintaining a constant rate of turn when making a 360° left turn.
- Accurate determination of aircraft power and controllability for maneuvers requiring OGE HOVER power.

DEFINITION

An OGE Check can be performed at any time when there is a question mark about the control or power of the aircraft.

Altitude vertically to 100 feet or on top of surrounding obstacles, whichever is higher. The helicopter's engine instruments are constantly observed. The limits of the aircraft are not exceeded. A 360-degree left/right turn is made while continuously checking the power and control of the aircraft. The maneuver is finished at ground effect or at the desired height.

COMMON ERRORS

- Not being able to maintain high hover altitude.
- Inability to prevent drifts.

NORMAL TAKEOFF FROM A HOVER

STANDARDS

- Before Take Off Checks
- Cyclic acceleration: -10°± 1°
- Power Regulation: ± % 3
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

A normal takeoff from a hover is an orderly transition to forward flight and is executed to increase altitude safely and expeditiously. During the takeoff, fly a profile that avoids the cross-hatched or shaded areas of the height-velocity diagram.

TECHNIQUE

Bring the helicopter to a hover (3 feet) and make a performance check, which includes power, balance, and flight controls. The power check should include an evaluation of the amount of excess power available; that is, the difference between the power being used to hover and the power available at the existing altitude and temperature conditions. The balance condition of the helicopter is indicated by the position of the cyclic when maintaining a stationary hover. Wind necessitates some cyclic deflection, but there should not be an extreme deviation from neutral. Flight controls must move freely, and the helicopter should respond normally. Then, visually clear the surrounding area.

Start the helicopter moving by smoothly and slowly easing the cyclic forward (-10°). As the helicopter starts to move forward, increase the collective (+15 torque), as necessary, to prevent the helicopter from sinking and adjust the throttle to maintain rpm. The increase in power requires an increase in the proper antitorque pedal to maintain heading. Maintain a straight takeoff path throughout the takeoff.

While accelerating through effective translational lift, the helicopter begins to climb, and the nose tends to rise due to increased lift. At this point, adjust the collective to obtain normal climb power and apply enough forward cyclic to overcome the tendency of the nose to rise. Hold an attitude that allows a smooth acceleration toward. Controls are used in coordination to reach a speed of 30 Kt at 20 feet. When these conditions are reached, it is warned loudly as “DECISION POINT”. After the decision point is passed, the cyclic acceleration is continued while maintaining the power regulation.

Climbing airspeed and a commensurate gain in altitude so that the takeoff profile does not take the helicopter through any of the cross-hatched or shaded areas of the height-velocity diagram. As airspeed increases, place the aircraft in trim and allow a crab to take place to maintain ground track and a more favorable climb configuration. As the helicopter continues to climb and accelerate to best rate-of-climb, apply aft cyclic pressure to raise the nose smoothly to the normal climb attitude. Cycling is limited back as the speed reaches 80Kt, keeping 80Kt at 500 feet/min. The power is arranged to give a rate of climb of. Climbing fundamentals are checked along the climbing leg.

COMMON ERRORS

1. Failing to use sufficient collective pitch to prevent loss of altitude prior to attaining translational lift.

2. Adding power too rapidly at the beginning of the transition from hovering to forward flight without forward cyclic compensation, causing the helicopter to gain excessive altitude before acquiring airspeed.

3. Assuming an extreme nose-down attitude near the surface in the transition from hovering to forward flight.

4. Failing to maintain a straight flightpath over the surface (ground track).

5. Failing to maintain proper airspeed during the climb.

6. Failing to adjust the throttle to maintain proper rpm.

7. Failing to transition to a level crab to maintain ground track.

NORMAL APPROACH TO A HOVER

STANDARDS

- Maintaining Initial Standards: 300 feet ± 50 feet
- 75 Kt. ± 10 Kt.
- Maintaining Landing Decision Point: 70 feet ± 10 feet
  50 Kt. ± 5 Kt.
- Approach Angle: Normal Approach Angle
- Ground Track: ± 10 °
- Transition to Hover Height: 3 feet AGL ± 1 feet

DEFINITION

An approach is the transition from traffic pattern altitude to either a hover or to the surface. The approach should terminate at the hover altitude with the rate of descent and groundspeed reaching zero at the same time. Approaches are categorized according to the angle of descent as normal, steep, or shallow. In this chapter, concentration is on the normal approach. Steep and shallow approaches are discussed in the next chapter. Use the type of approach best suited to the existing conditions. These conditions may include obstacles, size and surface of the landing area, density altitude, wind direction and speed, and weight. Regardless of the type of approach, it should always be made to a specific, predetermined landing spot.

TECHNIQUE

A normal approach uses a descent profile of between 7° and 12° starting at approximately 300–500 feet AGL. 75 Kt and Ground+300 feet are maintained until the normal approach angle is established.

On final approach, at the recommended approach airspeed (75 Kt) and at approximately 300 feet AGL, the helicopter should be on the correct ground track (or ground alignment) for the intended landing site, but the axis of the helicopter does not have to be aligned until about 100' AGL to facilitate a controlled approach. Just prior to reaching the desired approach angle, begin the approach by lowering the collective sufficiently to get the helicopter decelerating and descending down the approach angle. With the decrease in the collective, the nose tends to pitch down, requiring aft cyclic to maintain the recommended approach airspeed attitude. Adjust antitorque pedals, as necessary, to maintain trim. Trainee should warn "On the path" and visualize the angle from the landing point to the middle of the skids or landing gear underneath them in the cockpit and maneuver the helicopter down that imaginary slope until the helicopter is at a hover centered over the landing point or touching down centered on the landing point. The most important standard for a normal approach is maintaining a consistent angle of approach to the termination point. The collective controls the angle of approach. Use the cyclic to control the rate of closure or how fast the helicopter is moving towards the touchdown point. Maintain entry airspeed until the apparent groundspeed and rate of closure appear to be increasing. At this point, slowly begin decelerating with slight aft cyclic, and smoothly lower the collective to maintain approach angle. Use the cyclic to maintain a rate of closure equivalent to a brisk walk.

The speed is gradually reduced to 50Kt at 70 feet. Before or after this point, it is the Landing Decision Point (LDP) at which it must be decided whether to continue the descent, or to abandon the descent and go around in the case of a single engine. When these conditions are reached, it is warned loudly as “LDP”.

At approximately 25 knots, depending on wind, the helicopter begins to lose effective translational lift. To compensate for loss of effective translational lift, increase the collective to maintain the approach angle, while maintaining the proper rpm. The increase of collective pitch tends to make the nose rise, requiring forward cyclic to maintain the proper rate of closure.

As the helicopter approaches the recommended hover altitude (3 feet), increase the collective sufficiently to maintain the hover. Helicopters require near maximum power to land because the inertia of the helicopter in a descent must be overcome by lift in the rotor system. At the same time, apply aft cyclic to stop any forward movement while controlling the heading with antitorque pedals.

COMMON ERRORS

1. Failing to maintain proper rpm during the entire approach.
2. Improper use of the collective in controlling the angle of descent.
3. Failing to make antitorque pedal corrections to compensate for collective changes during the approach.
4. Maintaining a constant airspeed on final approach instead of an apparent brisk walk.
5. Failing to simultaneously arrive at hovering altitude and attitude with zero groundspeed.
6. Low rpm in transition to the hover at the end of the approach.
7. Using too much aft cyclic close to the surface, which may result in tail rotor strikes.
8. Failure to crab above 100’AGL and slip below 100’AGL

MAXIMUM PERFORMANCE TAKEOFF (STEEP TAKEOFF)

STANDARDS

- Before Take Off Checks
- Accelerating Cycling (Attitude): -10°± 1°
- Power Setting: Until 30 Feet + % 3
- Altitude: 100 feet ± 10 feet
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

A maximum performance takeoff is used to climb at a steep angle to clear barriers in the flightpath. It can be used when taking off from small areas surrounded by high obstacles. Allow for a vertical takeoff, although not preferred, if obstruction clearance could be in doubt. Before attempting a maximum performance takeoff, know thoroughly the capabilities and limitations of the equipment. Also consider the wind velocity, temperature, density altitude, gross weight, center of gravity (CG) location, and other factors affecting pilot technique and the performance of the helicopter.

To accomplish this type of takeoff safely, there must be enough power to hover OGE in order to prevent the helicopter from sinking back to the surface after becoming airborne. A hover power check can be used to determine if there is sufficient power available to accomplish this maneuver. The angle of climb for a maximum performance takeoff depends on existing conditions. The more critical the conditions are, such as high-density altitudes, calm winds, and high gross weights, the shallower the angle of climb is. In light or no wind conditions, it might be necessary to operate in the crosshatched or shaded areas of the height/velocity diagram during the beginning of this maneuver. Therefore, be aware of the calculated risk when operating in these areas. An engine failure at a low altitude and airspeed could place the helicopter in a dangerous position, requiring a high degree of skill in making a safe autorotative landing.

TECHNIQUE

Before attempting a maximum performance takeoff, reposition the helicopter to the most downwind area to allow a longer takeoff climb, then bring the helicopter to a hover, and determine the excess power available by noting the difference between the power available and that required to hover. Also, perform a balance and flight control check and note the position of the cyclic. If the takeoff path allows, position the helicopter into the wind and return the helicopter to the surface. Normally, this maneuver is initiated from the surface. After checking the area for obstacles and other aircraft, select reference points along the takeoff path to maintain ground track. Also consider alternate routes in case the maneuver is not possible.

Begin the takeoff by getting the helicopter light on the skids 3 feet hover. Pause and neutralize all aircraft movement. Slowly increase the collective (hover torque+15) and position the cyclic to lift off in a 40 knot attitude. This is approximately the same attitude as when the helicopter is light on the skids. Continue to increase the collective slowly until the maximum power available is reached (takeoff power is normally 10 percent above power required for hover). This large collective movement requires a substantial increase. in pedal pressure to maintain heading. Use the cyclic, as necessary, to control movement toward the desired flightpath and, therefore, climb angle during the maneuver. Maintain rotor rpm at its maximum, and do not allow it to decrease since you would probably need to lower the collective to regain it. Maintain these inputs until the helicopter clears the obstacle, or until reaching 100 feet for demonstration purposes. This point is called the Take Off Decision Point and is loudly signaled as “TDP”. Then, establish a normal climb attitude and power setting. Asin any maximum performance maneuver, the techniques used affect the actual results. Smooth, coordinated inputs coupled with precise control allow the helicopter to attain its maximum performance. (75Kt and 500 fpm)

An acceptable but less preferred variation is to perform a vertical takeoff. This technique allows the pilot to descend vertically back into the confined area if the helicopter does not have the performance to clear the surrounding obstacles. During this maneuver, the helicopter must climb vertically and not be allowed to accelerate forward until the surrounding obstacles have been cleared. If not, a situation may develop where the helicopter does not have sufficient climb performance to avoid obstructions and may not have power to descend back to the takeoff point. The vertical takeoff might not be as efficient as the climbing profile but is much easier to abort from a vertical position directly over the landing point. The vertical takeoff however places the helicopter in the avoid are of the height/velocity diagram for a longer time. This maneuver requires hover OGE power to accomplish.

NOTE: The 100 feet used as the vertical take-off altitude in this movement is for training purposes. In case of an obstacle in the take-off direction, the decision point obstacle height is applied as + 100 feet.

Take-off on the Side Wind: It opens into the cyclic wind enough to maintain the ground track until the transitional lif is gained, and enough opposing pedal control is given to ensure the parallelism of the hull with the ground track. After this point, the helicopter is put into the trim and the ground track continues to be kept cyclically.

COMMON ERRORS

1. Failure to consider performance data, including height/ velocity diagram.

2. Nose too low initially causing horizontal flight rather than more vertical flight.

3. Failure to maintain maximum permissible rpm.

4. Abrupt control movements.

5. Failure to resume normal climb power and airspeed after clearing the obstacle.

STEEP APPROACH TO HOVER

STANDARDS

- Before Landing Checks
- Establishment of Initial Standards: 300 feet ± 50 feet
  50 Kt. ± 5 Kt.
- Establishing Landing Decision Point: 100 feet ± 10 feet
- Angle: Steep Approach Angle
- Ground Track: ± 10 °
- Transition to Hover: 3 feet ± 1 feet

DEFINITION

A steep approach is used primarily when there are obstacles in the approach path that are too high to allow a normal approach. A steep approach permits entry into most confined areas and is sometimes used to avoid areas of turbulence around a pinnacle. An approach angle of approximately 13° to 15° is considered a steep approach. Caution must be exercised to avoid the parameters for settling with power (20–100 percent of available power applied, airspeed of less than 10 knots, and a rate of descent greater than 300 fpm).

TECHNIQUE

Unlike the normal approach, while descending to Ground+300 feet in the base leg, the starting standards are provided by taking the speed 50Kt. At the final approach leg, 50 Kt and Ground+300 feet are maintained until the deep approach angle is cut. When the deep approach angle is seen, a loud "On Path" warning is made and the descent is started by pressing the collective down enough.

On final approach, maintain track with the intended touchdown point and into the wind as much as possible at the recommended approach airspeed. When intercepting an approach angle of 13° to 15°, begin the approach by lowering the collective sufficiently to start the helicopter descending down the approach path and decelerating. Use the proper antitorque pedal for trim. Since this angle is steeper than a normal approach angle, reduce the collective more than that required for a normal approach. Continue to decelerate with slight aft cyclic and smoothly lower the collective to maintain the approach angle.

The intended touchdown point may not always be visible throughout the approach, especially when landing to a hover. Pilots must learn to cue in to other references that are parallel to the intended landing area that will help them maintain ground track and position. Constant management of approach angle and airspeed is essential to any approach. Aft cyclic is required to decelerate sooner than a normal approach, and the rate of closure becomes apparent at a higher altitude. Maintain the approach angle and rate of descent with the collective, rate of closure with the cyclic, and trim with antitorque pedals.

The speed is gradually reduced to 50Kt or less at 100 feet. Before or after this point, it is the Landing Decision Point (LDP) at which it must be decided whether to continue the descent, or to abandon the descent and go around in the case of a single engine. When these conditions are reached, it is warned loudly as “LDP”.

The helicopter should be kept in trim just prior to loss of effective translational lift (approximately 25 knots). Below 100' AGL, the antitorque pedals should be adjusted to align the helicopter with the intended touchdown point. Visualize the location of the tail rotor behind the helicopter and fly the landing gear to 3 feet above the intended landing point. In small, confined areas, the pilot must precisely position the helicopter over the intended landing area. Therefore, the approach must stop at that point.

Loss of effective translational lift occurs higher in a steep approach (position 3), requiring an increase in the collective to prevent settling, and more forward cyclic to achieve the proper rate of closure. Once the intended landing area is reached, terminate the approach to a hover with zero groundspeed (position 4). If the approach has been executed properly, the helicopter will come to a halt at a hover altitude of 3 feet over the intended landing point with very little additional power required to hold the hover.

The pilot must aware that any wind effect is lost once the aircraft has descended below the barriers surrounding a confined area, causing the aircraft to settle more quickly. Additional power may be needed on a strong wind condition as the helicopter descends below the barriers.

COMMON ERRORS

1. Failing to maintain proper rpm during the entire approach.
2. Using collective improperly in maintaining the selected angle of descent.
3. Failing to make antitorque pedal corrections to compensate for collective pitch changes during the approach.
4. Slowing airspeed excessively in order to remain on the proper angle of descent.
5. Failing to determine when effective translational lift is being lost.
6. Failing to arrive at hovering altitude and attitude, and zero groundspeed almost simultaneously.
7. Utilizing low rpm in transition to the hover at the end of the approach.
8. Using too much aft cyclic close to the surface, which may result in the tail rotor striking the surface.
9. Failure to align landing gear with direction of travel no later than beginning of loss of translational lift.

TRAFFIC PATTERNS

STANDARDLAR

- Airspeed: ± 5 Kt.
- Altitude: ± 50 feet
- Turn Angle: 15° ± 5°

DEFINITION

A traffic pattern promotes safety by establishing a common track to help pilots determine their landing order and provide common reference. A traffic pattern is also useful to control the flow of traffic, particularly at airports without operating control towers. It affords a measure of safety, separation, protection, and administrative control over arriving, departing, and circling aircraft. Due to specialized operating characteristics, airplanes and helicopters do not mix well in the same traffic environment. At multiple-use airports, regulation states that helicopters should always avoid the flow of fixed-wing traffic. To do this, be familiar with the patterns typically flown by airplanes. In addition, learn how to fly these patterns in case air traffic control (ATC) requests a fixed-wing traffic pattern be flown.

An accepted helicopter traffic pattern is flown at 500 feet AGL and consists of right turns. This keeps the helicopter out of the flow of fixed-wing traffic.

Takeoff leg (upwind): After takeoff, 75 Kt speed and 500 feet / Min climb rate is established. After taking 300 feet of altitude, the crosswind leg is turned to the side leg by making a 90º change of direction with a climbing turn at the turning point. A helicopter may take off from a helipad into the wind with a turn to the right after 300 feet AGL or as needed to be in range of forced landing areas.

Crosswind leg: Considering the effects of the wind, it is tried to preserve the ground track. If the aerodrome altitude can be reached on the crosswind leg, 100 kt is reached by giving a cyclic forward 50 feet before the level flight altitude and level flight power is established. When the downwind leg turning point is reached, a 90º change of direction is made and the downwind leg is turned.

Downwind Leg: When 500 feet AGL is attained, a right turn to parallel the takeoff path is made for the downwind. After turning under the wind, if the square tour altitude has not been reached yet, the climb is continued. By making use of triangulations detected on the ground, ground track, speed (100 Kt.) and level flight power are maintained. Established level flight power is said loudly as "LEVEL FLIGHT TORQUE….. " in the first 1/3 part. In the last 1/3 part, before landing checks are completed. When the base leg turning point is reached, the descending turn begins. Then, as the intended landing point is about 45 degrees behind the abeam position of the helicopter, a right turn is made, and a descent is begun from downwind altitude to approximately 300 feet AGL for a base leg.

Base Leg: When the base leg turns point, 90º change of direction is made, while descending is achieved by reducing the collective. The attitude is cyclically taken to the state of 75 Kt. It is observed that 75 Kt is reached with a gradual decrease. The final approach altitude is reached in the last 1/3 of the main leg and level flight is started at 75 Kt. Before the final approach, the starting principles are established.

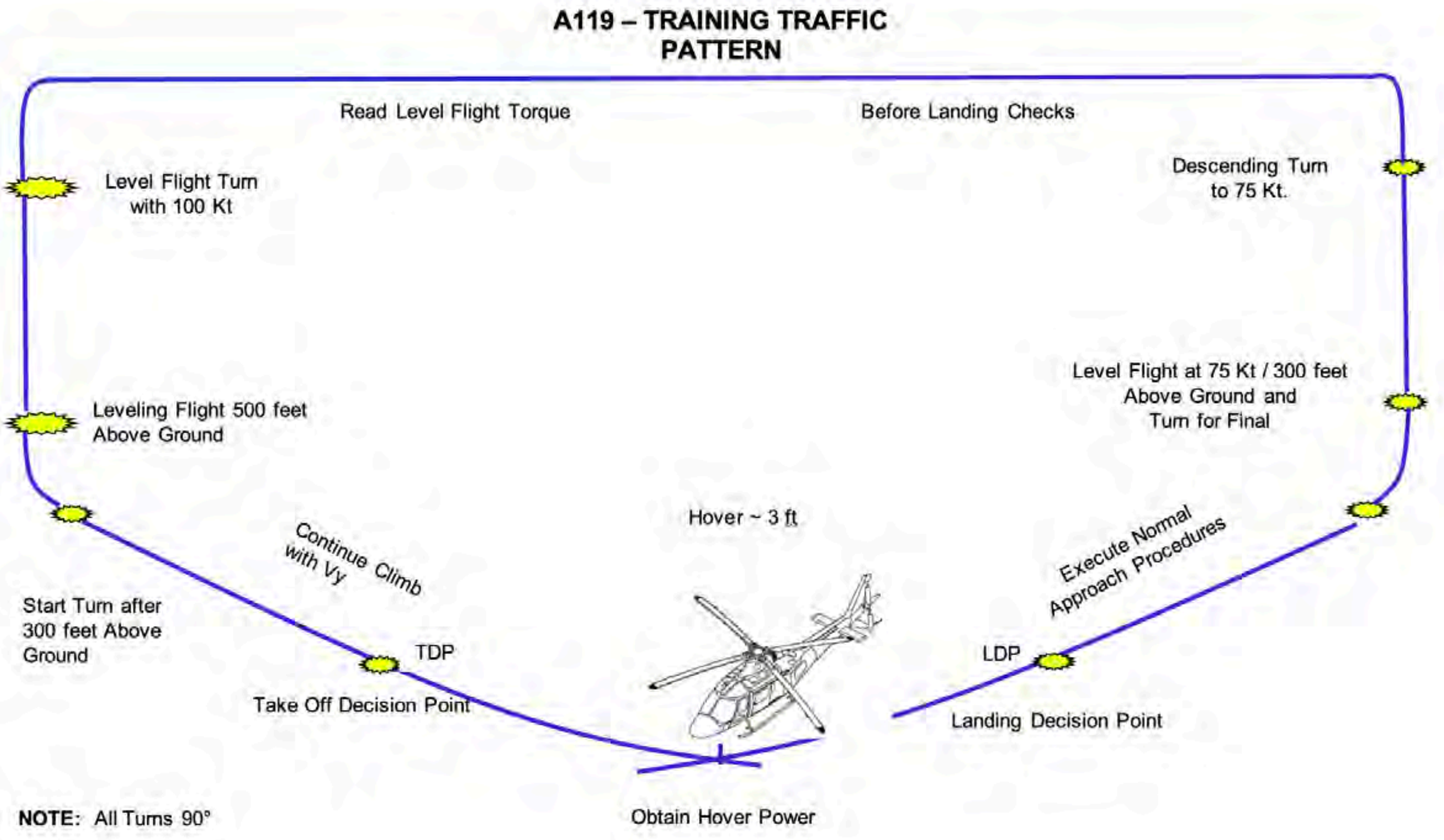
Final Approach Leg: Until the appropriate approach angle is established, the approach is continued with the speed and altitude determined according to the type of approach. When the desired approach angle is established, the descent is started by decreasing the collective. The continuation of the movement is as explained in the final approach.

As the helicopter nears the final approach path, the turn to final should be made considering winds and obstructions.

Depending on obstructions and forced landing areas, the final approach may need to be accomplished from as high as 500 feet AGL. The landing area should always be in sight and the angle of approach should never be too high (indicating that the base leg is too close) to the landing area or too low (indicating that the landing area is too far away).

COMMON ERRORS

- Not complying with the square traffic pattern,
- Not making the necessary wind corrections,
- Causing speed changes in turns,
- Being late in altitude and speed corrections,
- Not being able to coordinate the descending turn when returning to the main leg,
- Not being able to establish the starting standards when returning to final approach.


A119 – TRAINING TRAFFIC PATTERN
Read Level Flight Torque
Before Landing Checks
Level Flight Turn with 100 Kt
Descending Turn to 75 Kt.
Level Flight at 75 Kt / 300 feet Above Ground and Turn for Final
Leveling Flight 500 feet Above Ground
Hover ~ 3 ft
Continue Climb with Vy
Execute Normal Approach Procedures
Start Turn after 300 feet Above Ground
TDP
LDP
Take Off Decision Point
Landing Decision Point
NOTE: All Turns 90°
Obtain Hover Power

NORMAL TAKEOFF FROM THE SURFACE

STANDARDS

- Before takeoff checks
- Cyclic acceleration: Passing 3 feet ADI -10°± 1°
- Power regulation: ± % 3
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

Normal takeoff from the surface is used to move the helicopter from a position on the surface into effective translational lift and a normal climb using a minimum amount of power. If the surface is dusty or covered with loose snow, this technique provides the most favorable visibility conditions and reduces the possibility of debris being ingested by the engine.

TECHNIQUE

Place the helicopter in a stationary position on the surface. Lower the collective to the full down position and reduce the rpm below operating rpm. Visually clear the area and select terrain features or other objects to aid in maintaining the desired track during takeoff and climb out. Increase the throttle to the proper rpm and raise the collective slowly until the helicopter is light on the skids. Hesitate momentarily and adjust the cyclic and antitorque pedals, as necessary, to prevent any surface movement. Continue to apply upward collective. (Hover TQ + 10 TQ) As the helicopter leaves the ground, use the cyclic, as necessary, to begin forward movement as altitude is gained. Continue to accelerate, and as effective translational lift is attained, the helicopter begins to climb. Adjust attitude and power, if necessary, to climb in the same manner as a takeoff from a hover. A second less efficient but acceptable technique is to attempt a vertical takeoff to evaluate if power or lift is sufficient to clear obstructions. This allows the helicopter to be returned to the takeoff position if required.

If the ground surface is covered with dust or loose flying snow, the helicopter is cut off from the ground rapidly, reaching a height of 40-100ft with a fast and vertical climb. Subsequently, the necessary commands are given to establish the coordinated climb and speed. At the stage after reaching 50 ft, the same method is applied as in the normal take-off from the hover.

COMMON ERRORS

1. Departing the surface in an attitude that is too nose low. This situation requires the use of excessive power to initiate a climb. Not feeling the light on wheels or skids.

2. Using excessive power combined with a level attitude, which causes a vertical climb, unless needed for obstructions and landing considerations.

3. Application of the collective that is too abrupt when departing the surface, causing rpm and heading control errors.

NORMAL APPROACH TO THE SURFACE

STANDARDS

- Before landing checks
- Establishing Initials: 300 feet ± 50 feet
  Airspeed: 75 Kt. ± 10 Kt
- Establishing Decision Point: 70 feet ± 10 feet
  50 Kt. ± 5 Kt.
- Approach Angle: Normal approach angle
- Heading: ± 10 °
- Drift on the ground: 1 foot

DEFINITION

A normal approach to the surface or a no-hover landing is often used if loose snow or dusty surface conditions exist. These situations could cause severely restricted visibility, or the engine could possibly ingest debris when the helicopter comes to a hover. The approach is the same as the normal approach to a hover; however, instead of terminating at a hover, continue the approach to touchdown. Touchdown should occur with the skids level, zero groundspeed, and a rate of descent approaching zero.

TECHNIQUE

As the helicopter nears the surface, increase the collective, as necessary, to cushion the landing on the surface, terminate in a skids-level attitude with no forward movement.

COMMON ERRORS

1. Terminating to a hover, and then making a vertical landing.
2. Touching down with forward movement.
3. Approaching too slow, requiring the use of excessive power during the termination.
4. Approaching too fast, causing a hard landing
5. Not maintaining skids aligned with direction of travel at touchdown. Any movement or misalignment of the skids or gear can induce dynamic rollover.

SPEED CHANGES IN LEVEL FLIGHT

STANDARDS

- Altitude: ± 100 feet
- Airspeed: Slowing 65 Kt. ± 10 Kt. - Accelerating 100 Kt. ± 10 Kt.
- Track: ± 10°

DEFINITION

Before starting the SPEED CHANGES IN LEVEL FLIGHT movement, clearing environmental checks are made. By determining the wind direction and strength, it is ensured that the movement is started by establishing straight flight conditions into the wind, at a minimum altitude of 500 feet from the ground and on a suitable land section where the forced landing sites are located. As the collective begins to decrease, the cyclic is applied backwards, reducing the implied speed to 65 Kt. Meanwhile, pedal trim and ground track are maintained. Altimeter and variometer are cross-checked during backward of the cyclic. When the desired speed is reached, the collective is applied high enough to fly at slow flight speed for a while.

While the collective is applied high enough to accelerate, the altimeter and variometer are cross-checked and the cyclic is given far enough to ensure acceleration at the same altitude. Direction and ground track are preserved. As the desired speed is approached, level flight speed is re-established by reducing the collective sufficiently.

NOTE: Deceleration for training purposes 65 Kt. will be done up to speed.

COMMON ERRORS

- Failure to control environment.
- To start the action without establishing the initial principles.
- Using the controls uncoordinated and very serially.
- Not being able to maintain altitude.
- Falling below the deceleration speed.
- Not being able to keep track of direction and ground.

RAPID DECELERATION OR QUICK STOP

STANDARDS

- Altitude: ± 10 feet
- Airspeed: 75 Kt. ± 10 Kt.
- Deceleration Attitude: +20°- +25° ± 3°
- Track: ± 10°

DEFINITION

This maneuver is used to decelerate from forward flight to a hover. It is often used to abort takeoffs, to stop if something blocks the helicopter flightpath, in situations requiring rapid deceleration and stopping during flight or simply to terminate an air taxi maneuver, as mentioned in the RFM. A quick stop is usually practiced on a runway, taxiway, or over a large grassy area away from other traffic or obstacles.

TECHNIQUE

The maneuver requires a high degree of coordination of all controls. It is practiced at an altitude that permits a safe clearance between the tail rotor and the surface throughout the maneuver, especially at the point where the pitch attitude is highest. The altitude at completion should be no higher than the maximum safe hovering altitude prescribed by that particular helicopter's manufacturer. In selecting an altitude at which to begin the maneuver, take into account the overall length of the helicopter and its height-velocity diagram. Even though the maneuver is called a rapid deceleration or quick stop, it is performed slowly and smoothly with the primary emphasis on coordination.

During training, always perform this maneuver into the wind. After leveling off at an altitude between 25 and 40 feet, depending upon the manufacturer's recommendations, accelerate to the desired entry speed, which is approximately 45 knots for most training helicopters. (For training purposes, this flight maneuver may be done at 100 feet and 75Kt) The altitude chosen should be high enough to avoid danger to the tail rotor during the flare, but low enough to stay out of the hazardous areas of that helicopter's height velocity diagram throughout the maneuver. In addition, this altitude should be low enough that the helicopter can be brought to a hover during the recovery.

Initiate the deceleration by applying aft cyclic to reduce forward groundspeed. Simultaneously, lower the collective, as necessary, to counteract any climbing tendency. The timing must be exact. If too little collective is taken out for the amount of aft cyclic applied, the helicopter climbs. If too much downward collective is applied, the helicopter will descend. A rapid application of aft cyclic requires an equally rapid application of down collective. As collective pitch is lowered, apply proper antitorque pedal pressure to maintain heading, and adjust the throttle to maintain rpm. The G loading on the rotor system depends on the pitch-up attitude. If the attitude is too high, the rotor system may stall and cause the helicopter to impact the surface. (Max. +20°- +25°)

After attaining the desired speed, initiate the recovery by lowering the nose and allowing the helicopter to descend to a normal hovering altitude in level flight and zero groundspeed. During the recovery, increase collective pitch, as necessary, to stop the helicopter at normal hovering altitude, adjust the throttle to maintain rpm, and apply proper antitorque pedal pressure, as necessary, to maintain heading. During the maneuver, visualize rotating around the tail rotor until a normal hovering altitude is reached.

COMMON ERRORS

1. Initiating the maneuver by lowering the collective without aft cyclic pressure to maintain altitude.
2. Initially applying aft cyclic stick too rapidly, causing the helicopter to balloon (climb).
3. Failing to effectively control the rate of deceleration to accomplish the desired results.
4. Allowing the helicopter to stop forward motion in a tail-low attitude.
5. Failing to maintain proper rotor rpm.
6. Waiting too long to apply collective pitch (power) during the recovery, resulting in excessive manifold pressure or an over torque situation when collective pitch is applied rapidly.
7. Failing to maintain a safe clearance over the terrain.
8. Using antitorque pedals improperly, resulting in erratic heading changes.
9. Using an excessively nose-high attitude.

RECONNAISSANCE PROCEDURES

STANDARDS

- Airspeed: 65 Kt. ± 10 Knot.
- Altitude: ± 100 feet
- Observation angle: 30° - 45°

DEFINITION

When planning to land or take off at an unfamiliar site, gather as much information as possible about the area.

Reconnaissance techniques are ways of gathering this information.

High Reconnaissance

The purpose of conducting a high reconnaissance is to determine direction and speed of the wind, a touchdown point, suitability of the landing area, approach and departure axes, and obstacles for both the approach and departure. The pilot should also give particular consideration to forced landing areas in case of an emergency.

Altitude, airspeed, and flight pattern for a high reconnaissance are governed by wind and terrain features. It is important to strike a balance between a reconnaissance conducted too high and one too low. It should not be flown so low that a pilot must divide attention between studying the area and avoiding obstructions to flight. A high reconnaissance should be flown at an altitude of 300 to 500 feet above the surface. A general rule to follow is to ensure that sufficient altitude is available at all times to land into the wind in case of engine failure. In addition, a 45° angle of observation generally allows the best estimate of the height of barriers, the presence of obstacles, the size of the area, and the slope of the terrain. Always maintain safe altitudes and airspeeds and keep a forced landing area within reach whenever possible.

Low Reconnaissance

A low reconnaissance is accomplished during the approach to the landing area. When flying the approach, verify what was observed in the high reconnaissance, and check for anything new that may have been missed at a higher altitude, such as wires and their supporting structures (poles, towers, etc.), slopes, and small crevices. If the pilot determines that the area chosen is safe to land in, the approach can be continued. However, the decision to land or go around must be made prior to decelerating below effective translational lift (ETL), or before descending below the barriers surrounding the confined area.

If a decision is made to complete the approach, terminate the landing to a hover in order to check the landing point carefully before lowering the helicopter to the surface. Under certain conditions, it may be desirable to continue the approach to the surface. Once the helicopter is on the ground, maintain operating rpm until the stability of the helicopter has been checked to be sure it is in a secure and safe position.

Ground Reconnaissance

Prior to departing an unfamiliar location, make a detailed analysis of the area. There are several factors to consider during this evaluation. Besides determining the best departure path and identifying all hazards in the area, select a route that gets the helicopter from its present position to the takeoff point while avoiding all hazards, especially to the tail rotor and landing gear.

Some things to consider while formulating a takeoff plan are the aircraft load, height of obstacles, the shape of the area, direction of the wind, and surface conditions. Surface conditions can consist of dust, sand and snow, as well as mud and rocks. Dust landings and snow landings can lead to a brownout or whiteout condition, which is the loss of the horizon reference. Disorientation may occur, leading to ground contact, often with fatal results. Taking off or landing on uneven terrain, mud, or rocks can cause the tail rotor to strike the surface or if the skids get caught can lead to dynamic rollover. If the helicopter is heavily loaded, determine if there is sufficient power to clear the obstacles. Sometimes it is better to pick a path over shorter obstacles than to take off directly into the wind. Also evaluate the shape of the area so that a path can be chosen that will provide you the most room to maneuver and abort the takeoff if necessary. Positioning the helicopter to the most downwind portion of the confined area gives the pilot the most distance to clear obstacles. Wind analysis also helps determine the route of takeoff. The prevailing wind can be altered by obstructions on the departure path and can significantly affect aircraft performance. There are several ways to check the wind direction before taking off. One technique is to watch the tops of the trees; another is to look for any smoke in the area. If there is a body of water in the area, look to see which way the water is rippling. If wind direction is still in question revert back to the last report that was received by either ATIS or airport tower.

COMMON ERRORS

- Making major changes in flight altitude and speed,
- Approaching too close or far from the region without controlling the turns according to the wind,
- Not paying attention to other traffic,
- Not choosing suitable forced landing sites,
- Not choosing a suitable landing site,
- Not choosing the correct landing and take-off direction.

CONFINED AREA OPERATIONS

STANDARDS

- **Before Approach**
  - Altitude: ± 100 ft.
  - Airspeed: ± 10 Kt.
  - Reconnaissance of landing Site.
- **On Approach**
  - Maintaining the ground track.
  - Establishment and maintenance of a fixed approach angle.
  - Maintaining the proper rate of descent.
  - Low reconnaissance.
  - Making a soft and controlled landing in the first 1/3 of the landing area.
- **Before Take Off**
  - Proper completion of the ground reconnaissance and selection of an appropriate departure destination.
  - Carrying out a hover power check and completing pre-take-off checks if necessary.
  - Taxiing to the departure point.
- **Before Reaching Obstacles**
  - Heading: ±10°.
  - Maintaining the ground track.
- • Using the necessary power to pass the obstacles without exceeding the limits.
- **After Obstacles**
  - Climbing speed: ±10 Kt.
  - Rate of Climb: ± 100 fpm.
  - Keeping the aircraft on trim.
  - Maintaining the ground track.

DEFINITION

A confined area is an area where the flight of the helicopter is limited in some direction by terrain or the presence of obstructions, natural or manmade. For example, a clearing in the woods, a city street, a road, a building roof, etc., can each be regarded as a confined area. The helicopter pilot has added responsibilities when conducting operations from a confined area that airplanes pilots do not. He or she assumes the additional roles of the surveyor, engineer, and manager when selecting an area to conduct operations. While airplane pilots generally operate from known pre-surveyed and improved landing areas, helicopter pilots fly into areas never used before for helicopter operations. Generally, takeoffs and landings should be made into the wind to obtain maximum airspeed with minimum groundspeed. The pilot should begin with as nearly accurate an altimeter setting as possible to determine the altitude.

There are several things to consider when operating in confined areas. One of the most important is maintaining a clearance between the rotors and obstacles forming the confined area. The tail rotor deserves special consideration because, in some helicopters, it is not always visible from the cabin. This not only applies while making the approach, but also while hovering. Another consideration is that wires are especially difficult to see; however, their supporting devices, such as poles or towers, serve as an indication of their presence and approximate height. If any wind is present, expect some turbulence.

Something else to consider is the availability of forced landing areas during the planned approach. Think about the possibility of flying from one alternate landing area to another throughout the approach, while avoiding unfavorable areas. Always leave a way out in case the landing cannot be completed, or a go-around is necessary.

During the high reconnaissance, the pilot needs to formulate a takeoff plan as well. The heights of obstacles need to be determined. It is not good practice to land in an area and then determine that insufficient power exists to depart. Generally, more power is required to take off than to land, so the takeoff criteria is most crucial. Fixing the departure azimuth or heading on the compass is a good technique to use. This ensures that the pilot is able to take off over the preselected departure path when it is not visible while sitting in the confined area.

Approach

A high reconnaissance should be completed before initiating the confined area approach. Start the approach phase using the wind and speed to the best possible advantage. Keep in mind areas suitable for forced landing. It may be necessary to choose a crosswind approach that is over an open area, then one directly into the wind that is over trees. If these conditions exist, consider the possibility of making the initial phase of the approach crosswind over the open area and then turning into the wind for the final portion of the approach.

Always operate the helicopter as close to its normal capabilities as possible, taking into consideration the situation at hand. In all confined area operations, with the exception of the pinnacle operation, the angle of descent should be no steeper than necessary to clear any barrier with the tail rotor in the approach path and still land on the selected spot. The angle of climb on takeoff should be normal, or not steeper than necessary to clear any barrier. Clearing a barrier by a few feet and maintaining normal operating rpm, with perhaps a reserve of power, is better than clearing a barrier by a wide margin but with a dangerously low rpm and no power reserve.

The descent is initiated when the approach angle is established, which crosses the landing point and the obstacle +100 feet. Considering a possible engine failure during the approach, the speed (40 Kt for training) cannot be dropped without overcoming obstacles. If a go-around is to be decided, it must be before falling under the obstacles and losing the speed. While passing obstacles, the current forward speed and sink rate are reduced, and the movement is terminated so that the ground speed above the landing point is zero.

Always make the landing to a specific point and not to some general area. This point should be located well forward, away from the approach end of the area. The more confined the area is, the more essential it is that the helicopter land precisely at a definite point. Keep this point in sight during the entire final approach. When flying a helicopter near obstacles, always consider the tail rotor. A safe angle of descent over barriers must be established to ensure tail rotor clearance of all obstructions. After coming to a hover, avoid turning the tail into obstructions.

Takeoff

A confined area takeoff is considered an altitude over airspeed maneuver where altitude gain is more important to airspeed gain. Before takeoff, make a reconnaissance from the ground or cockpit to determine the type of takeoff to be performed, to determine the point from which the takeoff should be initiated to ensure the maximum amount of available area, and finally, how to maneuver the helicopter best from the landing point to the proposed takeoff position.

If wind conditions and available area permit, the helicopter should be brought to a hover, turned around, and hovered forward from the landing position to the takeoff position. Under certain conditions, sideward flight to the takeoff position may be preferred, but rearward flight may be necessary, stopping often while moving to check on the location of obstacles relative to the tail rotor.

For take-off, the collective is applied continuously and smoothly, while the cyclic is given as far forward as necessary for passage over obstacles (from obstacle + 100 feet safe altitude). In the meantime, the engine and transmission clocks and RPM clocks are cross-checked, and the limits are followed. While passing the TDP, the cyclicity is advanced to reach the speed Vy and power is arranged to establish the desired climb rate.

When planning the takeoff, consider the direction of the wind, obstructions, and forced landing areas. To help fly up and over an obstacle, form an imaginary line from a point on the leading edge of the helicopter to the highest obstacle to be cleared. Fly this line of ascent with enough power to clear the obstacle by a safe distance. After clearing the obstacle, maintain the power setting and accelerate to the normal climb speed. Then, reduce power to the normal climb power setting.

COMMON ERRORS

1. Failure to perform, or improper performance of, a high or low reconnaissance.
2. Approach angle that is too steep or too shallow for the existing conditions.
3. Failing to maintain proper rpm.
4. Failure to consider emergency landing areas.
5. Failure to select a specific landing spot.
6. Failure to consider how wind and turbulence could affect the approach.
7. Improper takeoff and climb technique for existing conditions.
8. Failure to maintain safe clearance distance from obstructions.

PINNACLE AND RIDGELINE OPERATIONS

STANDARDLAR

1) Reconnaissance
- Maintain altitude ± 100 ft
- Entry Airspeed ± 10 Kt
- Making a suitable reconnaissance
- Airspeed 70Kt

2) Approach
- Maintaining the selected approach line and ground track.
- Establishing a fixed approach angle.
- Monitoring ground speed and descent rate.

3) Take Off
- Carrying out hover power checks, ground reconnaissance and before take off checks if necessary.
- Taxi to the departure point.
- Establishing take-off power without delay while maintaining heading within ±10°.
- Maintaining 65Kt ±10Kt.

DEFINITION

A pinnacle is an area from which the surface drops away steeply on all sides. A ridgeline is a long area from which the surface drops away steeply on one or two sides, such as a bluff or precipice. The absence of obstacles does not necessarily decrease the difficulty of pinnacle or ridgeline operations. Updrafts, downdrafts, and turbulence, together with unsuitable terrain in which to make a forced landing, may still present extreme hazards.

Approach and Landing

If there is a need to climb to a pinnacle or ridgeline, do it on the upwind side, when practicable, to take advantage of any updrafts. The approach flightpath should be parallel to the ridgeline and into the wind as much as possible.

When flying an approach to a pinnacle or ridgeline, avoid the areas where downdrafts are present, especially when excess power is limited. If downdrafts are encountered, it may become necessary to make an immediate turn away from the pinnacle to avoid being forced into the rising terrain.

Load, altitude, wind conditions, and terrain features determine the angle to use in the final part of an approach. As a general rule, the greater the winds are, the steeper the approach needs to be to avoid turbulent air and downdrafts.

Groundspeed during the approach is more difficult to judge because visual references are farther away than during approaches over trees or flat terrain. Pilots must continually perceive the apparent rate of closure by observing the apparent change in size of the landing zone features. Avoid the appearance of an increasing rate of closure to the landing site. The apparent rate of closure should be that of a brisk walk. If a crosswind exists, remain clear of down-drafts on the leeward or downwind side of the ridgeline. If the wind velocity makes the crosswind landing hazardous, it may be possible to make a low, coordinated turn into the wind just prior to terminating the approach. When making an approach to a pinnacle, avoid leeward turbulence and keep the helicopter within reach of a forced landing area as long as possible.

On landing, take advantage of the long axis of the area when wind conditions permit. Touchdown should be made in the forward portion of the area. When approaching to land on pinnacles, especially manmade areas such as rooftop pads, the pilot should determine the personnel access pathway to the helipad and ensure that the tail rotor is not allowed to intrude into that walkway or zone. Parking or landing with the tail rotor off the platform ensures personnel safety. Always perform a stability check prior to reducing rpm to ensure the landing gear is on firm terrain that can safely support the weight of the helicopter. Accomplish this by slowly moving the cyclic and pedals while lowering the collective. If movement is detected, reposition the aircraft.

Takeoff

A pinnacle takeoff is considered an airspeed over altitude maneuver which can be made from the ground or from a hover. Since pinnacles and ridgelines are generally higher than the immediate surrounding terrain, gaining airspeed on the takeoff is more important than gaining altitude. As airspeed increases, the departure from the pinnacle is more rapid and helicopter time in the “avoid” area of the height/velocity decreases. In addition to covering unfavorable terrain rapidly, a higher airspeed affords a more favorable glide angle and thus contributes to the chances of reaching a safe area in the event of a forced landing. If a suitable forced landing area is not available, a higher airspeed also permits a more effective flare prior to making an autorotative landing.

On takeoff, as the helicopter moves out of ground effect, maintain altitude and accelerate to normal climb airspeed. When normal climb speed is attained, establish a normal climb attitude. Never dive the helicopter down the slope after clearing the pinnacle.

NOTE: By evaluating performance, altitude, obstacle situation and environmental conditions, the take-off technique can be changed in the form of acceleration at constant altitude or to provide the safe take-off profile that the pilot deems appropriate.

When the speed Vy is reached, the cycle is applied backwards, and normal climbing principles are established.

COMMON ERRORS

1. Failing to perform, or improper performance of, a high or low reconnaissance.
2. Flying the approach angle too steep or too shallow for the existing conditions.
3. Failing to maintain proper rpm.
4. Failing to consider emergency landing areas.
5. Failing to consider how wind and turbulence could affect the approach and takeoff.
6. Failure to maintain pinnacle elevation after takeoff.
7. Failure to maintain proper approach rate of closure.
8. Failure to achieve climb airspeed in timely manner.

SLOPE OPERATIONS

STANDARDS

- Keeping the head direction perpendicular to the slope ± 5°
- The drift before touching the ground should not exceed 1 feet, there should be no drift after touching the ground,
- Soft, smooth and controlled descent and ground contact,
- Smooth and controlled vertical ascent.

DEFINITION

A119; <u>RFM SECTION 1 LIMITATIONS Slope Landing/Take Off Limits:</u>

- Right/Left: 10°, Slope Up: 12°, Slope Down: 2°

Prior to conducting any slope operations, be thoroughly familiar with the characteristics of dynamic rollover and mast bumping. The approach to a slope is similar to the approach to any other landing area. During slope operations, make allowances for wind, barriers, and forced landing sites in case of engine failure. Since the slope may constitute an obstruction to wind passage, anticipate turbulence and downdrafts.

Slope Landing

A pilot usually lands a helicopter across the slope rather than with the slope. Landing with the helicopter facing down the slope or downhill is not recommended because of the possibility of striking the tail rotor on the surface.

TECHNIQUE

At the termination of the approach, if necessary, move the helicopter slowly toward the slope, being careful not to turn the tail upslope. Position the helicopter across the slope at a stabilized hover headed into the wind over the intended landing spot. Downward pressure on the collective starts the helicopter descending. As the upslope skid touches the ground, hesitate momentarily in a level attitude, then apply slight lateral cyclic in the direction of the slope. This holds the skid against the slope while the pilot continues lowering the downslope skid with the collective. As the collective is lowered, continue to move the cyclic toward the slope to maintain a fixed position. The slope must be shallow enough to hold the helicopter against it with the cyclic during the entire landing. A slope of 5° is considered maximum for normal operation of most helicopters. Consult the RFM for the specific limitations of the helicopter being flown.

Be aware of any abnormal vibration or mast bumping that signals maximum cyclic deflection. If this occurs, abandon the landing because the slope is too steep. In most helicopters with a counterclockwise rotor system, landings can be made on steeper slopes when holding the cyclic to the right. When landing on slopes using left cyclic, some cyclic input must be used to overcome the translating tendency. If wind is not a factor, consider the drifting tendency when determining landing direction.

After the downslope skid is on the surface, reduce the collective to full down, and neutralize the cyclic and pedals. Normal operating rpm should be maintained until the full weight of the helicopter is on the landing gear. This ensures adequate rpm for immediate takeoff in case the helicopter starts sliding down the slope. Use antitorque pedals as necessary throughout the landing for heading control. Before reducing the rpm, move the cyclic control as necessary to check that the helicopter is firmly on the ground.

Landing: Autopilot and SAS are deactivated before starting the slope work. The slope landing area is approached at an angle between 45° and 90°. A stable stance is ensured with the wheels perpendicular to the slope. The tail of the helicopter is not moved up the slope. Good pedal control is essential for the safety of the descent. Stand on a fixed floor 3 feet above the landing place. Most of the attention is given to the front and outside of the helicopter. The collective is started to decrease, allowing the helicopter to slowly collapse, and the helicopter's horizon is maintained. While the wheel on the upper side of the slope touches the ground, the necessary controls are given to prevent the helicopter from tipping down the slope, and the horizon is provided on the horizontal axis by looking over the maroon panel. In the meantime, maximum attention is paid to the pedal trim. Without giving a deep command and using the beep trim on the cyclic, the collective is pressed down to maintain the horizon while simultaneously opening the cyclic uphill with reference from the top of the claret red panel. It should not be forgotten that if the cyclic slope approaches the limits during the descent phase, the slope of the slope is high and there may be a limit exceedance. Depending on the slope of the slope, the cyclic slope is opened up enough and after the appropriate mast slope is provided, the collective is held down for a soft contact of the downhill sled to the ground and the descent is completed in this way.

If the correct cyclic trim is done, there will be no need for additional beep trim when the downhill wheel is touching the ground. However, if the cyclic trim is not sufficient, enough cyclicity can be opened up the slope to prevent tipping down the slope while sitting on the ground. After making sure that the wheels are fully seated on the floor, the collective is pressed down softly. Cycles and pedals are centered.

COMMON ERRORS

1. Failing to consider wind effects during the approach and landing.

2. Failing to maintain proper rpm throughout the entire maneuver.

3. Failure to maintain heading resulting in a turning or pivoting motion.

4. Turning the tail of the helicopter into the slope.

5. Lowering the downslope skid or wheel too rapidly.

6. Applying excessive cyclic control into the slope, causing mast bumping.

Slope Takeoff

A slope takeoff is basically the reverse of a slope landing. Conditions that may be associated with the slope, such as turbulence and obstacles, must be considered during the takeoff. Planning should include suitable forced landing areas.

TECHNIQUE

Begin the takeoff by increasing rpm to the normal range with the collective full down. Then, move the cyclic toward the slope. Holding the cyclic toward the direction of the slope causes the downslope skid to rise as the pilot slowly raises the collective. As the skid comes up, move the cyclic as necessary to maintain a level attitude in relation to the horizon. If properly coordinated, the helicopter should attain a level attitude as the cyclic reaches the neutral position. At the same time, use antitorque pedal pressure to maintain heading and throttle to maintain rpm. With the helicopter level and the cyclic centered, pause momentarily to verify everything is correct, and then gradually raise the collective to complete the liftoff. After reaching a hover, avoid hitting the ground with the tail rotor by not turning the helicopter tail upslope and gaining enough altitude to ensure the tail rotor is clear. If an upslope wind exists, execute a crosswind takeoff and then make a turn into the wind after clearing the ground with the tail rotor.

Take-off: The take-off from the slope to the nook is almost the same way of landing on the slope, but in the opposite direction. First, it is applied upwards until the collective attenuation state, while the cyclicity opens up sufficiently. When the attenuation condition is achieved, the current drifts and deviations in the head direction are eliminated, and at this point, the downhill skit is cut off the ground with a small upward collective application. The claret panel is applied collectively upwards until its upper part is parallel to the ground, and the direction is maintained with the pedals. Once the horizon has been achieved, the slope is cyclical down and the collective is kept full up enough to maintain the horizon. When the pall plane is in the horizontal position, the collective is applied upwards and the wheel is cut off from the ground, the movement is completed with a vertical movement. When leaving the slope, the tail should never be turned up the slope, the slope area should be left parallel to the slope.

COMMON ERRORS

1. Failing to adjust cyclic control to keep the helicopter from sliding down slope.

2. Failing to maintain proper rpm.

3. Holding excessive cyclic into the slope as the down slope skid is raised.

4. Failure to maintain heading, resulting in a turning or pivoting motion.

5. Turning the tail of the helicopter into the slope during takeoff.

Uphill Slope Landing-Take-off: The general principles of the movement and the control coordination principles are the same as the take-off movement perpendicular to the slope. Landing is performed in such a way that first the front parts of the wheels and then the back parts touch the ground. Take off is the opposite of landing. Cyclic trimming is done uphill in all conditions. All other movements are as described in the steep descent to the slope.

DEMONSTRATION OF Vh AND Vne SPEED

STANDARDS

- Keeping selected Altitude constant (Only for Vh)
- Heading: ± 10º
- Establishing maximum continuous power (69% Torque)

DEFINITION

Vh Speed (Maximum horizontal speed)

This speed refers to the maximum speed that the helicopter can fly at constant altitude using the maximum continuous torque value. Before starting this movement, if the helicopter has an autopilot, a fixed altitude, and a fixed heading (heading) are set to be kept by the autopilot. The collective is applied slowly up to the maximum sustained torque, while cyclic forward enough to keep the altitude constant. This coordinated motion continues until maximum torque is applied. When this torque value is reached, the speed is adjusted so that the altitude remains constant, and the conditions are stabilized by flying in this position for a short time. The Vh value is determined by saying the value read out loud on the airspeed indicator.

Vne Speed

This speed refers to the speed that should never be exceeded. The Vne value is determined by looking at the helicopter's Flight Manual or the Speed Limit Cards on the top of the helicopter's instrument panel. In training, Vne speed is also shown by making the necessary adjustments immediately after the Vh speed is shown. After the Vh speed is detected, altitude mode is deactivated if altitude is being held by autopilot. While maintaining the maximum continuous torque value or a torque value below it with the collective, the cyclic is slowly applied forward to reach the determined speed Vne. In the meantime, the helicopter is allowed to give altitude. When the speed Vne is seen on the speedometer, the speed is reduced without delay, while the collective is applied low enough to prevent the helicopter climbing. The flight continues at the desired speed and altitude**.**

STEEP TURNS

STANDARDS

- Altitude: ± 200 feet
- Roll Out Heading: ± 10º
- Airspeed: 100Kt ±10 Kt
- Bank Angle: 60º ±5º
- Ground Level+1000 feet or more.

DEFINITION

Before starting the maneuver, you should be at least 1000 feet above the ground and the ground track should be determined by choosing landmarks in the direction. The turns are made in the form of 360º rotations from the right or left. It should not be forgotten that the helicopter will tend to give more altitude when turning from the left compared to the turning from the right.

After constant altitude, ground track and speed (100kt.) are provided, the cleanliness control of the direction to which the turn will be made is made. The cyclic is slowly opened to the direction of rotation and the movement is started. While the cyclic opens smoothly and continuously in the direction of the turn until it reaches a bank angle of 60º, the collective is applied sufficiently upwards to prevent loss of altitude and the cyclic is kept back enough to prevent the attitude from falling down and increasing the speed. During the movement, bank angle from ADI and heading angle from RMI are cross controlled. External references are visually checked, and the direction of return is followed. While 30º (½ of the bank angle) per ascent is left, the exit control is given to the opposite side slowly, and necessary control corrections are made to maintain the speed and altitude. The movement is completed at the initial flight direction, altitude and speed

COMMON ERRORS

- Not being able to maintain a stable bank angle,
- Allowing deep altitude loss.
- Not being able to prevent the speed increase.
- Being late at the exit.

FUEL FLOW CONTROL

STANDARDS

- Comparison of the fuel at departure time with the total fuel required.
- Fuel consumption control at 15-30 minutes following the first reading 10 minutes after switching to level flight or entering operation conditions.
- If actual fuel consumption varies from planned values and the flight cannot be completed with the required reserve fuel, implementation of the reserve course of action.
- Frequent checking of fuel amount and fuel consumption throughout the flight.

DEFINITION

- Fuel Check Before Takeoff: The total fuel in the tank is determined. It is compared to the required fuel calculated in pre-flight planning. If the fuel is insufficient, the helicopter is refueled.
- Initial Air-Fuel Check: After the helicopter is leveled and the appropriate power settings, the total amount of fuel and the reading time are recorded.
- Fuel Consumption Check: 10 min. after the helicopter is at the operation flight altitude time and the remaining fuel are recorded. The remaining fuel is checked and noted in 15-30 minutes. Fuel consumption rate, end and reserve fuel start time are calculated and recorded. Considering the reserve fuel required, it is decided whether the remaining fuel is sufficient to complete the mission. If the amount of fuel is insufficient, the backup course of action is applied.
- Fuel Amount and Expenditure: The amount of fuel and expenditure rate are periodically checked. If the fuel quantity and flow deviate from the calculated values, the fuel flow calculation is repeated to determine if the fuel is sufficient to complete the flight.

2.A119.2 FLIGHT MANEUVERS REFERENCE LIST

Flight Manuals of all aircraft included in the authorization chart of our ATO.

All normal maneuvers to be performed in the trainings are detailed in AW119 RFM Section 2 Normal Procedures.

All emergency maneuvers to be performed in the trainings are detailed in AW119 RFM Section 3 Emergency and Malfunction Procedures.

BRIEFING AND FLIGHT MANEUVERS
(AW109)

2.AW109. BRIEFING AND FLIGHT MANEUVERS

2.AW109.1 FLIGHT MANEUVERS

2. AW109. BRIEFING AND FLIGHT MANEUVERS

2. AW109.1 FLIGHT MANEUVERS

VFR MANEUVERS

STRAIGHT-and-LEVEL FLIGHT

STANDARDS

- Airspeed: 100 KT ± 5 KT.
- Altitude: ±50 Feet
- Heading: ± 10°

DEFINITION

Straight-and-level flight is flight in which constant altitude and heading are maintained. The attitude of the rotor disk relative to the horizon determines the airspeed. The horizontal stabilizer design determines the helicopter's attitude when stabilized at an airspeed and altitude. Altitude is primarily controlled by use of the collective.

1. This exercise introduces co-ordination of all three controls. Accuracy is most important but do not concentrate on one control to the detriment of the other two. Try to anticipate the control movement required and thereby, prevent errors rather than correct them. Use external references as much as possible and avoid 'flying on instruments.

2. Using the Upper Modes to maintain straight and level flight gives you, the pilot more time for "eyes out" of the cockpit to maintain a better lookout. It also frees up capacity to manage other systems for example navigation. However, it is very important that this type of automation is monitored to ensure that the aircraft is flying the expected profile.

TECHNIQUE

MAINTAIN STRAIGHT AND LEVEL FLIGHT

1. Straight flight is maintained by ensuring that the 'wings' are level and that the aircraft is flying in balance.

2. Level flight is maintained by controlling attitude (speed stable attitude) and therefore airspeed with cyclic stick and height with collective lever (power or Tq). Understanding attitude and power combinations is important in order to fly smoothly and accurately. Normally, airspeed/height errors are small and therefore, only small corrections are required. Should an error occur, consider correcting the airspeed first as this may also correct the height error. For example; speed is higher than planned and you are descending so adjust the attitude to reduce speed and this will also correct the descent. Be patient and allow time for the corrective action to take effect.

3. The power required to maintain S&L flight varies with airspeed. As airspeed increases the power required reduces to a minimum at Vy 80 KIAS. Thereafter, the power required increases as airspeed increases (120 KIAS S&L power is approximately 60-65% Tq). Remember this will depend on DA (density altitude) and (AUM) aircraft weight.

4. To select and maintain 120 KIAS. Engage the FTR on the collective and then set the approximate power required for 120 KIAS. At the same time use the beep trim on the cyclic to adjust the pitch for a speed stable attitude; approximately 0 deg pitch. You will be able to confirm that the aircraft is speed stable by the speed trend indicator on the left hand side of the PFD.

5. Check that there is no ROC or ROD on the VSI on the right hand side of the PFD (see above). If there is, check that the speed is stable, if not then a small adjustment on the cyclic beep trim should correct the ROC or ROD. If the speed is stable then the power and therefore the collective will need an adjustment. Engage the FTR on the collective and adjust the Tq.

6. The turn co-ordination will be active and the aircraft should be in balanced flight. If it is not: engage the pedal trims put the ball into the middle and check the slip indicator.

7. Finally check that the "wings are level". If they are not then adjust the roll with the beep trim on the cyclic.

8. There are 2 ways to display the Bank angle Display. In the Basic Mode the display will be “Sky Pointer” The Bank Angle Display is only shown when de-clutter is not selected.

MAINTAIN STRAIGHT AND LEVEL FLIGHT WITH THE USE OF UPPER MODE HOLDS

1. The Upper Modes are engaged on the APMS panel. For straight and level flight the following are used. HDG, ALT and IAS.

2. Engage the IAS on the APMS, the PFD will display IAS at the bottom and the magenta bug will appear on the airspeed tape along with a magenta digital read out of the target speed above the airspeed tape.

3. Engage the ALT on the APMS, the PFD will display ALT at the bottom and the magenta bug will appear on the right-hand side of the PFD on the altitude tape along with a magenta digital read out above the altitude tape.

4 Engage the HDG on the APMS, the PFD will display HDG at the bottom of the PFD and the magenta bug will appear on the heading tape and also on the MFD compass rose.

5. Remember that turn co-ordination is active automatically so the aircraft balance will be maintained.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

    a. Lookout. CRM “Heads in” “Heads out calls”

    b. Monitor fuel and engine instruments.

    c. Monitor the automation.

NOTES FOR THE STUDENT

1. Identify the beep trims on the cyclic and collective and keep your thumbs on them. This will avoid the need to keep looking inside the cockpit to identify them. Focus can then be on the PFD bugs to ensure correct selection of height, speeds and headings.

2. With the HDG hold engaged activation of the FTR on the pedals will synchronize the heading bug to the 12 o’clock position. Care must be taken not to do this inadvertently.

3. As always, when using automation the flight path of the aircraft must be monitored.

4. Maintain lookout and SA especially with regards to other traffic.

If a sideways drift is observed in the helicopter due to the side wind, the cyclic control opens into the wind. In proportion to the wind force, the head is turned into the wind and the cyclic control is brought back to its initial position, crab is given, and the helicopter is trimmed.

COMMON ERRORS

- Failure to trim the helicopter properly, tending to hold antitorque pedal pressure and opposite cyclic. This is commonly called cross-controlling.
- Failure to maintain desired airspeed.
- Failure to hold proper control position to maintain
  desired ground track.
- Failure to allow helicopter to stabilize at new airspeed.

TURNS

STANDARDS

- Airspeed: 100 KT ± 5 KT.
- Altitude: ±50 Feet
- Bank Angle: 15 º ± 5 º
- Rolling out of the turn: ± 5

DEFINITION

A turn is a maneuver used to change the heading of the helicopter.

1. The principle for turns is as you have utilized before (i.e. bank/balance/power). It is important that attitude is maintained from the initial application of 'bank' and that no attempt is made to chase minor speed changes. As the turn is established, altitude is controlled with collective. If the aircraft attitude changes due to collective input, re-gain the required attitude with the cyclic.

2. There are 3 methods of turning the aircraft onto specified heading. They all have their advantages and adapting which method is best for the situation will be clear once they have been practiced. The methods are:

a. Against force spring pressure.

b. Using the beep trim on the cyclic.

c. Engaging the FTR and releasing at the desired AOB.

TECHNIQUE

Before beginning any turn, the area in the direction of the turn must be cleared not only at the helicopter's altitude, but also above and below.

TURN ONTO NEW HEADING USING A STANDARD TURN WHILST IN LEVEL FLIGHT

1. A Standard Turn is defined as a Rate 1 turn. Rate 1 = 3° per second rate of turn Bank depends on speed.

Use the formula:

Speed divided by 10 + half the airspeed (A/S)

Example at 120 KIAS= 120/10 = 12 + half A/S = 12+6 Rate 1 turn = 18 Degrees

For ease in high workload situations, you can use the formula:

Speed divided by 10 + 7

Example at 120KIAS = 120/10 = 12 + 7 = 12+7 Rate 1 turn = 19 Degrees

2. Turning against spring pressure. Apply cyclic stick against the spring pressure. Try to apply a smooth rate of roll into and out of the turn, turn co-ordination will maintain balance. Height is maintained with collective lever; however, in turns of up to 30° AOB, very little adjustment should be necessary.

Anticipate the roll-out onto heading by releasing the cyclic spring pressure with 10° to go.

a. During the turn a small amount of forward or aft cyclic pressure may be needed to maintain speed.

b. This method is best suited for either small heading changes or for use at night or in IMC because if the cyclic is released at any time during the turn the aircraft is still trimmed for the wings level attitude.

3. Turning using the cyclic beep trim. Using the beep trim on the cyclic push the button in the desired direction of turn. There is a small amount of lag but look at the horizon and try to visually judge the AOB required and confirm on the PFD roll indicator. Turn co-ordination will maintain balance. Again, height is maintained with collective; however, in turns of up to 30° AOB, very little adjustment should be necessary.

Anticipate the roll out by pushing the beep trim back to the wings level attitude degree for degree. For example, 20° AOB start moving the beep trim 20° before the desired roll out heading. Check balance, power, wings level and FT as necessary.

a. If the beep trim has only been moved laterally during the turn the attitude and therefore airspeed should not need to be adjusted.

b. An advantage to this method is that the aircraft is very stable in the turn and it is accurate selecting the required AOB.

c. It is good for sustained turns over 180°heading changes.

d. The disadvantage is that in a sustained turn without a discernible horizon or in IMC it can be disorientating when rolling out of the AOB to make sure that you are rolling out in the correct direction.

4. Turn using the FTR. Engage the FTR on the cyclic and smoothly roll on the AOB. Look at the angle of the disc on the horizon and try to visually judge the AOB, confirm with the roll indicator and release the FT. Turn co-ordination will maintain balance. If there have been any changes to pitch and therefore speed use the cyclic beep trim to adjust the attitude. Height is maintained with collective, but if there is a ROC or ROD on the VSI and the speed has changed wait until the input from the cyclic pitch change settles and then re-assess.

Anticipate the roll out with 30° to go by engaging the cyclic FTR and smoothly rolling out selecting the wings level attitude and speed stable pitch. Release the FT and then beep trim the fine adjustments. Check balance and trim the pedals

a. The advantage of this technique is that, providing the correct action is used by the pilot, it is very effective at rapidly reaching an AOB (i.e. in an avoiding turn).

b. It is good for sustained turns of over 180° heading changes. Aircraft is in a trimmed condition.

c. Disadvantage of using this technique is that the aircraft is unstable in roll and pitch during the time that the FT is engaged. It is more difficult to accurately select the desired AOB.

TURN ONTO NEW HEADING USING A MEDIUM TURN WHILST IN LEVEL FLIGHT

1. Medium angle of bank will be between 15° and 30°. For training Medium Turns will be performed at 30° angle of bank (AOB).

2. Turning against spring pressure. The technique is the same as above however the collective FTR will have to be engaged on the collective and the power increased to maintain the height, remembering to take off any power that you may have applied as you roll out of the turn. There may be a tendency to pull back on the cyclic. Try to maintain the pitch attitude in the turn. It is more difficult to maintain the desired AOB. Try not to over control, you may find it easier to have a solid arm position on your leg. There will be a need to “back out” of the roll slightly with cyclic to maintain 30° AOB

3. Turning using the cyclic beep trim. As per the standard turn, however, a small amount of collective power will be needed to maintain height. It has the same advantages and disadvantages as the standard turn.

4. Turn using the FTR. Use the horizon and the disc attitude to visually judge 30°confirm with the roll indicator but before you release the trim also check the pitch attitude. Once you release the FT at 30° make any further adjustments to pitch using the cyclic beep trim, allow the corrections to settle and then check the VSI and if required apply a small amount of collective power to maintain height. On rolling out remember to take off any power that you may have applied. It has the same advantages and disadvantages as the standard turn.

TURN ONTO NEW HEADING USING A STANDARD TURN WHILST IN LEVEL FLIGHT

WITH THE USE OF FLIGHT DIRECTOR

1. Engage the HDG hold on the APMS. The PFD will display HDG at the bottom of the PFD and the magenta bug at the top on the HDG tape.

2. In the cruise at 120 KIAS change the heading reference using the cyclic TRIM (L/R positions). This will move the magenta bug on the HDG tape and change the numbers on the digital read out.

a. Note that the HDG tape only displays 60° total. If you need to turn more than this amount the HDG bug will edge limit, but the digital readout will continue to increase.

b. However the MFD can be used for situational awareness of the heading required as it displays 360°, the magenta and cyan pre-selection bugs are displayed but only a digital readout of the current aircraft heading.

3. The rate of turn will be controlled by the automation and should be calculated automatically as per a standard rate 1 turn.

4. Pre-selection and change of reference heading can also be done by rotating the HDG knob on the RBP. Heading pre-selection is displayed on the PFDs and MFDs in cyan with a digital readout and a pre-selection bug. Pressing the HDG button will change the pre-selection into the commanded HDG.

5. By pressing the HDG button when the mode is engaged, if no heading pre-selection has been done, the current aircraft magnetic heading is set as heading reference.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout in the direction of turn.

b. Monitor fuel and engine instruments.

c. Tq awareness during Steep Turns

NOTES FOR THE STUDENT

1. It is important to maintain eyes out during the turn and not to fly on instruments. The AOB should be judged visually by using the attitude of the disc and the angle it cuts on the horizon backed up and confirmed by the roll indicator on the PFD.

2. Monitor the automation being used and ensure the aircraft is flying the expected flight profile.

3. Maintain lookout and SA whilst turning especially with regards to other aircraft

SLIPS

A slip occurs when the helicopter slides sideways toward the center of the turn. It is caused by an insufficient amount of antitorque pedal in the direction of the turn, or too much in the direction opposite the turn, in relation to the amount of power used. In other words, if you hold improper antitorque pedal pressure,

which keeps the nose from following the turn, the helicopter slips sideways toward the center of the turn.

SKIDS

A skid occurs when the helicopter slides sideways away from the center of the turn. It is caused by too much antitorque pedal pressure in the direction of the turn, or by too little in the direction opposite the turn in relation to the amount of power used. If the helicopter is forced to turn faster with increased pedal pressure instead of by increasing the degree of the bank, it skids sideways away from the center of the turn instead of flying in its normal curved path.

In summary, a skid occurs when the rate of turn is too great for the amount of bank being used, and a slip occurs when the rate of turn is too low for the amount of bank being used.

COMMON ERRORS

- Failure to maintain altitude.
- Failure to hold airspeed and heading.
- Causing slips and skids.
- Failure to maintain bank angle.
- Failure to roll out at desired heading.

ALTITUDE CHANGES CLIMBING AND DESCENDING

STANDARDS

- Airspeed: (Vy) 80 Kt ± 5 Kt.
- Heading: ± 5 °
- Transition to Level Flight: ±50 Feet

DEFINITION

1.This serial will consolidate the flying controls co-ordination required in order to achieve a desired flight path and altitude changes. The exercises covered are flown both with and without holds engaged, providing an ideal opportunity to consolidate on previously taught techniques.

2.There are various techniques to climb and descend, the two you will cover are:

a. Standard Climb and Descent. The standard climb is most commonly used when a higher ROC/D is required or on an initial climb out from an airfield (Path 2 during Cat "A" operations). It is conducted at 80 KIAS (Vy) which will give the greatest power margin.

b. Cruise Climb and Descent. The cruise climb is best described as a maneuver where the aircraft is flown at a specified ROC/ROD maintaining cruise speed, particularly useful when instrument flying.

NORMAL CLIMB

The entry into a climb from a hover has already been described in the Normal Takeoff from a Hover subsection; therefore, this discussion is limited to a climb entry from cruising flight.

NORMAL DESCENT

A normal descent is a maneuver in which the helicopter loses altitude at a controlled rate in a controlled attitude.

TECHNIQUE

For training purposes, a climb rate of 80 Kt and a rate of 500fpm are used.

CARRY OUT ALTITUDE CHANGES CONDUCTING A STANDARD CLIMB AND DESCENT WITHOUT FLIGHT DIRECTOR WHILST MAINTAINING HEADING

1. During this exercise you will practice the standard climb configuration which will be performed at Vy (80 KIAS) and 750ft/min rate of climb.

- *The sequence for entering and levelling off from the climb can be remembered by the mnemonic T-APT: Trim - Attitude, Power, Trim.*

2. Initiate the Climb. Start the exercise from cruise flight at 120 KIAS. Trim the cyclic with either the beep trim or the FTR to a decelerative attitude towards a speed reduction of 80 KIAS. Engage the FTR on the collective and increase the power (approx. 20%) to obtain 750ft/min rate of climb. Anticipate 80 KIAS during the climb and adjust the cyclic to maintain a speed stable attitude. During the initial deceleration to 80 KIAS with a 20% increase in power ROC will be considerably higher than 750ft/min.

3. Level Off from the Climb. Anticipate the level off by 10% of the rate of climb. At this height, using the mnemonic T-APT: Trim - Attitude, Power, Trim, trim the cyclic to an accelerative attitude by either using the beep trim or FTR. As the rate of climb reduces and the airspeed increases, check the heading and balance. As the airspeed approaches 120 KIAS readjust the pitch with cyclic to a speed stable attitude, lower the collective to select cruise power and release the FT.

CARRY OUT ALTITUDE CHANGES CONDUCTING A CRUISE CLIMB AND DESCENT WITHOUT USE OF THE FLIGHT DIRECTOR, MAINTAINING SPEED AND HEADING

1. Before carrying out a cruise climb, lookout (lookout turns will allow a check behind and reduce any cockpit blind spots). Attitude throughout the maneuver will be maintained by the ATT function but small adjustments may be required in order to maintain exact speed by the use of the cyclic beep trim. Engage the collective trim and adjust power (monitor torque) to achieve the desired ROC normally 500ft/min, (as an average, 15% Tq will give approx. 500ft/min and 25% Tq will give approx. 1000ft/min ROC) and trim. With [ATT] engaged, aircraft balance will be maintained following collective application but small adjustments to heading maybe required using the cyclic against trim pressure (roll and release). Re-adjust the aircraft attitude as you apply power if required. Ensure the aircraft is trimmed correctly and in balance throughout. Continue the lookout during the climb and anticipate the level off by 10% of the ROC. Level off at the required altitude by engaging the FTR on the collective and adjusting accordingly in order to achieve zero VSI. Allow datum's to settle prior to carrying out fine adjustments of attitude with cyclic beep trim.

2. As for the cruise climb, conduct a good lookout before commencing the descent maneuver. Attitude will be maintained by the [ATT] function. Engage the collective trim and adjust power to achieve the desired ROD normally 500ft/min, (as an average 10% Tq will give approx. 500ft/min and 15% Tq will give approx. 1000ft/min ROD) trim. With [ATT] engaged balance will be maintained following collective application but heading may require pilot input. Re-adjust the aircraft attitude as you reduce power if required. Ensure the aircraft is correctly trimmed and in balance throughout. Continue your lookout during the descent and anticipate the level off by 10% of the ROD. Level off at the required altitude by engaging the FTR on the collective and adjusting power back to cruise power to achieve zero VSI. Allow datum's to settle prior to carrying out fine adjustments of attitude with cyclic beep trim.

CARRY OUT ALTITUDE CHANGES USING THE VARIOUS METHODS OF THE FLIGHT DIRECTOR MAINTAINING SPEED AND HEADING

1. The Upper Modes are engaged with the APMS panel. For changes in Altitude the following can be used and will be covered:

a. ALT. The "ALT" mode allows the pilot to acquire and hold a BARO corrected altitude reference and can be used to adjust the altitude of the aircraft.

b. ALTA. The "ALTA" mode allows the pilot to acquire a pre-selected barometric altitude (defined as target altitude) between -1000ft and 20000ft.

c. VS. The VS mode allows the pilot to capture and hold an inertial vertical speed reference between - 1500ft/min (descent) and 2000ft/min (climb).

2. ALT. Engage the ALT on the APMS, ALT will be displayed at the bottom of the PFD and the magenta bug will appear on the altitude tape synchronizing at the current altitude. The altitude is now adjusted with the beep trim, forward and aft on the collective or by turning the ALT knob on the APMS. The magenta bug will move and a digital readout will be displayed to show the selected altitude.

a. When changing the ALT with the collective beep trim, the aircraft attitude will need to be adjusted to maintain the airspeed; this should be done with fine adjustment of the cyclic beep trim.

b. Remember that turn co-ordination is active automatically so the aircraft balance should be maintained.

c. By pushing the ALT on the RBP (remote bug panel) it will synchronize and reset the magenta bug to the current altitude.

3. ALTA. Selection of the target altitude is achieved by rotating the ALT knob on the Remote Bugs Panel (RBP), the target altitude is then displayed on the PFD. The mode can be engaged/disengaged pressing the ALTA lighted push button on the APMS control panel. When the ALTA mode is engaged, the ON indication is illuminated, and a Green ALTA annunciation is displayed on the PFD. A magenta bug will appear on the altitude tape along with a digital target altitude, and a target vertical speed. The default is: 700 ft/min rate of climb or descent.

a. If a different vertical speed is required, the vertical speed reference can be modified rotating the VS knob on the APMS control panel.

b. The vertical speed reference can also be modified using the collective TRIM (UP-DN positions) or pushing the collective FTR that releases the collective trim actuator and synchronizes the position reference of the collective control with the current VS reference

4. VS. VS mode can be engaged/disengaged pressing the “VS” push and rotary knob on the APMS control panel. When the mode is engaged the green triangle beside the knob illuminates and a green “VS” annunciation is displayed on the collective annunciation field PFD.

a. Selection of vertical speed reference is achieved by rotating the “VS” knob on the APMS.

b. The vertical speed reference can also be modified using the collective TRIM (UP/DN positions) or pushing the collective FTR that releases the collective trim actuator and synchronizes the position reference of the collective control with the current “VS” reference.

c. The vertical speed reference is displayed on the PFDs as a digital readout and a datum bug.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout above and below.

b. Monitor engine instruments.

c. Monitor the automation being used.

d. CRM “Heads in” “Heads out calls”

NOTES FOR THE STUDENT

1. Identify the beep trim on the collective and keep your thumb on it. This will avoid the need to keep looking inside the cockpit to identify it. Focus can then be on the PFD bug to ensure correct altitude selection.

2. As always, when using automation the flight path of the aircraft must be monitored.

3. Maintain lookout and SA (Situational Awareness) especially with regards to other traffic. Before carrying out any climbing and descending conduct a lookout above and below the aircraft a 90°lookout turn will allow a check behind and check any cockpit blind spots.

COMMON ERRORS

1. Failure to maintain proper power and airspeed.

2. Holding too much or too little antitorque pedal.
3. In the level-off, decreasing power before adjusting the nose to cruising attitude.
4. Failure to maintain Ground Track.
5. Failure to maintain constant angle of decent during training.
6. Failure to level-off the aircraft sufficiently, which results in recovery below the desired altitude.
7. Failure to adjust antitorque pedal pressures for changes in power.

TURNS WHILE CLIMBING OR DESCENDING

STANDARDS

- Airspeed: (Vy) 80 Kt ± 5 Kt.
- Roll out to level flight: ± 50 Feet / ± 5 º
- Heading: ± 5 º
- Bank Angle: 15 º ± 5 º
- Rate of descent and climb: ± 500 feet/min

TECHNIQUE

For training purposes, 500 feet of altitude and 180 degrees of direction changes are made during these maneuvers. The discussion on level turns is equally applicable to making turns while climbing or descending. The only difference is that the helicopter is in a climbing or descending attitude rather than that of level flight. If a simultaneous entry is desired, merely combine the techniques of both maneuvers— climb or descent entry and turn entry. When recovering from a climbing or descending turn, the desired heading and altitude are rarely reached at the same time. If the heading is reached first, stop the turn and maintain the climb or descent until reaching the desired altitude. On the other hand, if the altitude is reached first, establish the level flight attitude, and continue the turn to the desired heading.

COMMON ERRORS

- Failure to do the Descent/Climb simultaneously with the turn.
- Not being able to adjust the Descent/Climb power.
- Inability to maintain bank angle and airspeed.

VERTICAL TAKEOFF TO A HOVER

STANDARDS

- Heading: ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting: 1 foot
- Into wind.
- In wind up to 40kts wind velocity.

DEFINITION

A vertical takeoff to a hover involves flying the helicopter from the ground vertically to a landing gear height of 3 feet, while maintaining a constant heading. Once the desired skid height is achieved, the helicopter should remain nearly motionless over a reference point at a constant altitude and on a constant heading. The maneuver requires a high degree of concentration and coordination.
1. The area should be obstruction free and, for this exercise, the surface should be as level as possible. You will be expected to carry out the normal checks of fuel and engine instruments, and also the before takeoff, after takeoff, the before landing and after landing checks. During a series of takeoffs and landings checks may be verbalized as “no change”, provided no switches or services have been altered.

2. Throughout the landing or takeoff sequence, use the external hover references and do not be tempted to look at the ground immediately in front of the aircraft.
3. The control actions to achieve a stable hover are the same as for other aircraft types. To ensure maximum benefit is made of SAS and ATT hold to assist in aircraft stability, correct use of the FTR is essential. This sortie is also an opportunity to equate aircraft movement externally with respect to the sensitivity of the speed vector on the MFD.

TECHNIQUE

The pilot on the controls needs to clear the area left, right, and above to perform a vertical takeoff to a hover. The pilot should remain focused outside the aircraft and obtain clearance to take off from the controlling tower. If necessary, the pilot who is not on the controls assists in clearing the aircraft and provides adequate warning of any obstacles and any unannounced or unusual drift/altitude changes.

Heading control, direction of turn, and rate of turn at hover are all controlled by using the pedals. Hover height, rate of ascent, and the rate of descent are controlled by using the collective. Helicopter position and the direction of travel are controlled by the cyclic.

After receiving the proper clearance and ensuring that the area is clear of obstacles and traffic, begin the maneuver with the collective in the down position and the cyclic in a neutral position, or slightly into the wind.

TAKE OFF VERTICALLY AND ESTABLISH THE HOVER

1. The SP hovers with approximately 3° left wheel low, into wind. This means that when lifting into the hover anticipate the right wheel to break contact with the ground first.
2. Before takeoff, ensure the Nose Wheel is aligned forward and that the Nose Wheel lock is on, that the immediate vicinity is clear and that it is safe to take off.
3. Engage the FTR on the collective, cyclic and pedals look well ahead of the aircraft and then begin to raise the collective lever gently. As the aircraft becomes 'lighter on the wheels', correct any tendency for the aircraft to yaw (pedals) or slide (cyclic stick). As the aircraft begins to lift off (right wheel first) the cyclic will now need to be moved very slightly to select the hover attitude; the pedals will need to be adjusted very slightly to maintain heading.
4. It is important to continue raising the collective lever to ensure that the aircraft makes a clean break with the ground and commences a steady climb. Continue the climb, maintaining ground position and heading until the correct hover height is reached, 3ft AGL visually judged but confirmed on the MFD RAD height. (see below)
5. Use the normal smooth, gentle movements to stabilize the hover, release the FTR on the pedals and collective and when steady, carry out the after takeoff checks
   a. Flight instruments: Check.
   b. Engine parameters: Confirm within limits.
   c. Transmission parameters: Confirm within limits. (Note TQ)
   d. Hydraulic systems parameters: Confirm within limits.
   e. N2 / NR: Confirm N2 /NR 102%.

TAKE-OFF OUT OF WIND

1. It is always desirable to take off and land heading into wind but this is not always possible. For example, positioning the aircraft for a landing on an acceptable degree of slope may well involve heading the aircraft out of wind, which will alter the hover attitude.
2. The Take-Off. This is similar to a normal take-off but you will have to take into account the effect that the wind will have on the aircraft once it leaves the ground.

a. Crosswind Take-Off. As per normal takeoff but, raise the collective lever slowly and at the same time position the cyclic towards the wind. As the aircraft lifts adjust the cyclic to maintain a steady hover over the takeoff point. There will be a need to displace the cyclic into wind.

b. Downwind Take-Off. From the downwind position the technique differs in that the collective lever is raised slightly before the cyclic is offset into wind. This is for tail clearance during the transition to the hover.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:
   a. Maintain a good lookout for fixed obstacles, other aircraft and vehicles
   b. Monitor engine instruments, Tq and fuel contents.

c. Avoid hovering over uneven or sloping ground, or above normal height. In both cases more Tq will be required, and the chances of carrying out a safe SE landing in the event of a failure will be reduced.
d. Monitor wind velocity.
e. Loss of tail rotor authority - smooth and careful use of pedals and collective lever, particularly with strong crosswinds, to reduce risk of loss of tail rotor authority.
f. Awareness of Ground Clearance.
g. Checks.

NOTES FOR THE STUDENT

1. Smooth and gentle control inputs are required throughout these maneuvers. However, if you find that you are over-controlling especially with the collective, simply set a sensible Tq figure and release the collective FT, this should allow the aircraft to settle.
2. When conducting the maneuvers try not to focus on markers too close to the aircraft in order to maintain the hover position.
The risks associated with Takeoffs and Landings are:
a. Ground Resonance. Incorrect tire pressures (especially if the aircraft is rolling on its wheels) can lead to a quick onset of ground resonance. Apply the appropriate technique of immediate takeoff or shutdown if encountered.
b. Dynamic Rollover. Be aware of dynamic rollover on slopes, during taxiing and even during operations on flat ground. Any lateral drift during touchdown can cause this problem if a reject is performed i.e. the aircraft if lifted too quickly back into the hover. Furthermore, a fully compressed tire contains an amount of Potential Energy. If that energy is released too quickly, especially when complimentary to other forces, such as tail rotor thrust and the horizontal component of main rotor thrust (i.e. rotating about the right wheel with too much cyclic) then dynamic rollover can occur.

COMMON ERRORS

1. Failing to ascend vertically as the helicopter becomes airborne.
2. Pulling excessive collective to become airborne, causing the helicopter to gain too much altitude.
3. Overcontrolling the antitorque pedals, which not only changes the heading of the helicopter, but also changes the rpm.
4. Reducing throttle rapidly in situations in which proper rpm has been exceeded, usually resulting in exaggerated heading changes and loss of lift, resulting in loss of altitude.
5. Failing to ascend slowly.

HOVERING

DEFINITION

Hovering is a maneuver in which the helicopter is maintained in nearly motionless flight over a reference point at a constant altitude and on a constant heading.

TECHNIQUE

To maintain a hover over a point, use sideview and peripheral vision to look for small changes in the helicopter's attitude and altitude. When these changes are noted, make the necessary control inputs before the helicopter starts to move from the point. To detect small variations in altitude or position, the main area of visual attention needs to be some distance from the aircraft, using various points on the helicopter or the tip-path plane as a reference. Looking too closely or looking down leads to overcontrolling. Obviously, in order to remain over a certain point, know where the point is, but do not focus all attention there.

As with a takeoff, the pilot controls altitude with the collective and maintains a constant rpm with the throttle. The cyclic is used to maintain the helicopter's position; the pedals, to control heading. To maintain the helicopter in a stabilized hover, make small, smooth, coordinated corrections. As the desired effect occurs, remove the correction in order to stop the helicopter's movement. For example, if the helicopter begins to move rearward, apply a small amount of forward cyclic pressure. However, neutralize this pressure just before the helicopter comes to a stop, or it will begin to move forward.

After experience is gained, a pilot develops a certain “feel” for the helicopter. Small deviations can be felt and seen, so you can make the corrections before the helicopter actually moves. A certain relaxed looseness develops, and controlling the helicopter becomes second
nature, rather than a mechanical response.

1. The area should be obstruction free and, for this exercise, the surface should be as level as possible. You will be expected to carry out the normal checks of fuel and engine instruments, and also the before takeoff, after takeoff, the before landing and after landing checks. During a series of takeoffs and landings checks may be verbalized as “no change”, provided no switches or services have been altered.
2. Throughout the landing or takeoff sequence, use the external hover references and do not be tempted to look at the ground immediately in front of the aircraft.
3. The control actions to achieve a stable hover are the same as for other aircraft types. To ensure maximum benefit is made of SAS and ATT hold to assist in aircraft stability, correct use of the FTR is essential. This sortie is also an opportunity to equate aircraft movement externally with respect to the sensitivity of the speed vector on the MFD.
The SP hovers with approximately 3° left wheel low, into wind. This means that when lifting into the hover anticipate the right wheel to break contact with the ground first.
Before takeoff, ensure the Nose Wheel is aligned forward and that the Nose Wheel lock is on, that the immediate vicinity is clear and that it is safe to take off.
Engage the FTR on the collective, cyclic and pedals look well ahead of the aircraft and then begin to raise the collective lever gently. As the aircraft becomes ‘lighter on the wheels’, correct any tendency for the aircraft to yaw (pedals) or slide (cyclic stick). As the aircraft begins to lift off (right wheel first) the cyclic will now need to be moved very slightly to select the hover attitude; the pedals will need to be adjusted very slightly to maintain heading.
It is important to continue raising the collective lever to ensure that the aircraft makes a clean break with the ground and commences a steady climb. Continue the climb, maintaining ground position and heading until the correct hover height is reached, 3ft AGL visually judged but confirmed on the MFD RAD height. (see below)
5. Use the normal smooth, gentle movements to stabilize the hover, release the FTR on the pedals and collective and when steady, carry out the after takeoff checks

COMMON ERRORS

1. Tenseness and slow reactions to movements of the helicopter. Not feeling the wheels getting lighter.
2. Failure to allow for lag in cyclic and collective pitch, which leads to overcontrolling. It is very common for a student to get ahead of the helicopter. Due to inertia, it requires some small time period for the helicopter to respond.
3. Confusing attitude changes for altitude changes, which results in improper use of the controls.
4. Hovering too high, creating a hazardous flight condition. The height velocity chart should be referenced to determine the maximum skid height to hover and safely recover the helicopter should a malfunction occur.
5. Hovering too low, resulting in occasional touchdown.
6. Becoming overly confident over prepared surfaces when taking off to a hover. Be aware that dynamic rollover accidents usually occur over a level surface.

LANDING FROM HOVERING

STANDARDS

- Hover Height: 3 feet AGL
- Heading: ± 10 °
- Drifting Forward: 1 foot
- Drifting sideways and backwards is not allowed.

DEFINITION

1. The area should be obstruction free, and for this exercise, the surface should be as level as possible. You will be expected to carry out the normal checks of fuel and engine instruments, and also the before takeoff, after takeoff, the before landing and after landing checks. During a series of takeoffs and landings checks may be verbalized as “no change”, provided no switches or services have been altered.

2. Throughout the landing or takeoff sequence, use the external hover references and do not be tempted to look at the ground immediately in front of the aircraft.

3. The control actions to achieve a stable hover are the same as for other aircraft types. To ensure maximum benefit is made of SAS and ATT hold to assist in aircraft stability, correct use of the FTR is essential. This sortie is also an opportunity to equate aircraft movement externally with respect to the sensitivity of the speed vector on the MFD.

DESCEND VERTICALLY AND LAND

1. Landing. Carry out the Before Landing Checks and clear all around and beneath the aircraft, confirm that the surface is suitable. From a steady hover engage the FTR on the collective and cyclic, lower the collective to begin a smooth descent, maintaining ground position with the cyclic and aircraft heading with the pedals (heading hold is active providing ATT is on). Expect the aircraft to land left wheel first under normal loading conditions when into wind. As with the takeoff, it is important to correct for any drift early, there must be no lateral drift upon touchdown.

2. As the aircraft wheels come into contact with the ground, continue to lower the collective adjusting pedals to maintain aircraft heading. Brakes should be applied if the collective is to be lowered fully. unless taxiing is desired, in which case maintain some power to control the aircraft. Once the collective is fully down, carry out the After Landing Checks.

a. Nose wheel lock OFF (GND Taxi)

b. Cyclic Stick CENTERED/AS REQ

c. XPDR/ TCAS STBY

d. RPM Switch 100%

e. WX RDR / Pitot / Floats OFF

LAND OUT OF WIND

1. It is always desirable to take off and land heading into wind but this is not always possible. For example, positioning the aircraft for a landing on an acceptable degree of slope may well involve heading the aircraft out of wind, which will alter the hover attitude.

2. The Landing. The landing is controlled as normal but extra care must be taken to ensure that no lateral movement occurs at the point of touchdown.

Crosswind Landing. With a crosswind from the right the aircraft attitude will be less left wheel low, perhaps even level and the cyclic stick will be offset to the right. With a crosswind from the left the aircraft attitude will be more left wheel low than in the into-wind hover and the cyclic stick will be offset to the left. In both cases, the disc attitude is maintained with the cyclic stick until the aircraft has settled on both wheels. At this point, the cyclic stick may be gradually centralized.

4. As the collective lever is lowered to the fully down position. The pedals may become quite sensitive in gusty conditions and care must be taken to avoid over-controlling and perhaps, in extreme cases, over-torqueing.

Downwind Landing. The technique required is much the same as for the crosswind case. The pedals can be extremely sensitive and, once again it is possible to over-torque as a result of harsh pedal inputs.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Maintain a good lookout for fixed obstacles, other aircraft and vehicles

b. Monitor engine instruments, Tq and fuel contents.

c. Avoid hovering over uneven or sloping ground, or above normal height. In both cases more Tq will be required, and the chances of carrying out a safe SE landing in the event of a failure will be reduced.

d. Monitor wind velocity.

e. Loss of tail rotor authority - smooth and careful use of pedals and collective lever, particularly with strong crosswinds, to reduce risk of loss of tail rotor authority.

f. Awareness of Ground Clearance.

g. Checks.

NOTES FOR THE STUDENT

1. Smooth and gentle control inputs are required throughout these maneuvers. However, if you find that you are over-controlling especially with the collective, simply set a sensible Tq figure and release the collective FT, this should allow the aircraft to settle.

2. When conducting the maneuvers try not to focus on markers too close to the aircraft in order to maintain the hover position.

The risks associated with Takeoffs and Landings are:

a. Ground Resonance. Incorrect tyre pressures (especially if the aircraft is rolling on its wheels) can lead to a quick onset of ground resonance. Apply the appropriate technique of immediate takeoff or shutdown if encountered.

b. Dynamic Rollover. Be aware of dynamic rollover on slopes, during taxiing and even during operations on flat ground. Any lateral drift during touchdown can cause this problem if a reject is performed i.e. the aircraft if lifted too quickly back into the hover. Furthermore, a fully compressed tyre contains an amount of Potential Energy. If that energy is released too quickly, especially when complimentary to other forces, such as tail rotor thrust and the horizontal component of main rotor thrust (i.e. rotating about the right wheel with too much cyclic) then dynamic rollover can occur.

Carry out the Before Landing Checks and clear all around and beneath the aircraft, confirm that the surface is suitable. From a steady hover engage the FTR on the collective and cyclic, lower the collective to begin a smooth descent, maintaining ground position with the cyclic and aircraft heading with the pedals (heading hold is active providing ATT is on). Expect the aircraft to land left wheel first under normal loading conditions when into wind. As with the takeoff, it is important to correct for any drift early, there must be no lateral drift upon touchdown.

As the aircraft wheels come into contact with the ground, continue to lower the collective adjusting pedals to maintain aircraft heading. Brakes should be applied if the collective is to be lowered fully. unless taxiing is desired, in which case maintain some power to control the aircraft. Once the collective is fully down, carry out the After Landing Checks

COMMON ERRORS

- Sudden decreasing or intermittent use of the collective,
- Allowing deviations and drifts,
- Too much and unnecessary playing with the controllers.

HOVERING—FORWARD FLIGHT, TAXI

STANDARDS

- Heading ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting: ± 1 feet

DEFINITION

Forward hovering flight is normally used to move a helicopter to a specific location, and it may begin from a stationary hover. During the maneuver, constant groundspeed, altitude, and heading should be maintained.

TECHNIQUE

Before starting, pick out two references directly in front and in line with the helicopter. These reference points should be kept in line throughout the maneuver. Begin the maneuver from a normal hovering altitude by applying forward pressure on the cyclic. As movement begins, return the cyclic toward the neutral position to maintain low groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain a constant groundspeed and path over the ground with the cyclic, a constant heading with the antitorque pedals, altitude with the collective, and the proper rpm with the throttle.

To stop the forward movement, apply rearward cyclic pressure until the helicopter stops. As forward motion stops, return the cyclic to the neutral position to prevent rearward movement. Forward movement can also be stopped by simply applying rearward pressure to level the helicopter and allowing it to drift to a stop.

COMMON ERRORS

1. Exaggerated movement of the cyclic, resulting in erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to maintain alignment with direction of travel.

TAXIING

Taxiing refers to operations on or near the surface of taxiways or other prescribed routes. Helicopters utilize three different types of taxiing.

HOVER TAXI

A hover taxi is used when operating below 25 feet above ground level (AGL). Since hover taxi is just like forward, sideward, or rearward hovering flight, the technique to perform it is not presented here.

In the hover-taxi cyclic stick is used to control the groundspeed, the collective lever is used to control height and the pedals are used to point the aircraft in the required direction of travel. Remember that all controls can be trimmed.

From a steady 3ft hover, engage the FTR on the cyclic and select a slightly accelerative attitude and move forward, adjusting ground speed to a fast walking pace. Note the speed vector on the MFD, and the GS readout (see below). Maintain the height by engaging the FTR on the collective and adjust to avoid any sink and trim the pedals to maintain the direction of travel. HDG is automatically maintained when airspeed is below 40 kts. It is important to eliminate lateral drift in case it becomes necessary to carry out a run on landing.

The aircraft can be trimmed to the hover taxi making small adjustments against the spring pressure to maintain the desired height, speed and direction or the FTR can be engaged and the aircraft can be hover taxied un-stabilized.

In cross wind conditions, cross controlling of cyclic and pedals is required to ensure that the wheels are pointing in the direction of movement, maintaining height with collective.

To re-establish the hover, maintaining heading and height and use the beep trim on the cyclic is to bringing the speed vector back to the central position and allow the aircraft to drift to a halt.

AIR TAXI

An air taxi is preferred when movements require greater distances within an airport or heliport boundary. In this case, fly to the new location; however, it is expected that the helicopter will remain below 100 feet AGL with an appropriate airspeed and will avoid over flight of other aircraft, vehicles, and personnel.

TECHNIQUE

Before starting, determine the appropriate airspeed and altitude combination to remain out of the cross-hatched or shaded areas of the height-velocity diagram. Additionally, be aware of crosswind conditions that could lead to loss of tail rotor effectiveness. Pick out two references directly in front of the helicopter for the ground path desired. These reference points should be kept in line throughout the maneuver.

Begin the maneuver from a normal hovering altitude by applying forward pressure on the cyclic. As movement begins, attain the desired airspeed with the cyclic. Control the desired altitude with the collective and rpm with the throttle. Throughout the maneuver, maintain a desired groundspeed and ground track with the cyclic, a constant heading with antitorque pedals, the desired altitude with the collective, and proper operating rpm with the throttle.

To stop the forward movement, apply aft cyclic pressure to reduce forward speed. Simultaneously lower the collective to initiate a descent to hover altitude. As forward motion stops, return the cyclic to the neutral position to prevent rearward movement. As approaching the proper hover altitude, increase the collective as necessary to stop descent at hover altitude (much like a quick stop maneuver).

COMMON ERRORS

1. Erratic movement of the cyclic, resulting in improper airspeed control and erratic movement over the surface.

2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired altitude.
4. Failure to maintain proper rpm.
5. Overflying parked aircraft causing possible damage from rotor downwash.
6. Flying in the cross-hatched or shaded area of the height-velocity diagram.
7. Flying in a crosswind that could lead to loss of tail rotor effectiveness.
8. Excessive tail-low attitudes.
9. Excessive power used or required to stop.
10. Failure to maintain alignment with direction of travel.

SURFACE TAXI

A surface taxi is used to minimize the effects of rotor downwash. Avoid excessive cyclic displacement while surface taxiing or on the ground which can lead to main rotor blades contacting the helicopter or rotor mast. This technique may be used with wheeled aircraft, or with those that have floats, skids or skis.

TECHNIQUE

The helicopter should be in a stationary position on the surface with the collective full down and the rpm the same as that used for a hover. This rpm should be maintained throughout the maneuver. Then, move the cyclic slightly forward and apply gradual upward pressure on the collective to move the helicopter forward along the surface. Use the antitorque pedals to maintain heading and the cyclic to maintain ground track. The collective controls starting, stopping, and speed while taxiing. The higher the collective pitch, the faster the taxi speed; however, do not taxi faster than a brisk walk. If the helicopter is equipped with brakes, use them to help slow down. Do not use the cyclic to control groundspeed.

1. Before beginning to ground taxi ensure that the area is suitable, clear of hazards and obstructions. The Before Taxi/Take-Off Checks are then carried out:

GROUND TAXIING

Nose wheel lock: OFF.

Collective and cyclic: Increase collective slowly and move the cyclic stick gently forward to start movement.

Pedal brakes: Check operation.

Pedals: As required, to select direction keeping straight.

Collective and pedal brakes: To reduce speed and stop, lower the collective and apply pedal brakes. To check the operation of the brakes you will need to remove your feet from the floor and apply equal pressure to the top of the pedals, onto the braking plates.

Verbalize “braking” so the PNF and any passengers are aware of the aircraft coming to a stop.

It is important that the cyclic and collective positions are maintained while the brake check is conducted otherwise you may not be checking that the brakes are working and may be helping the aircraft to stop with the controls.

Set approx. 30% Tq and trim the pedals as necessary to maintain the level fuselage attitude. The actual Tq required will vary with aircraft AUM and the surface/slope over which the aircraft is moving.

Initially when taxiing if you do not apply enough power and therefore not enough pitch on the blades, as you move the cyclic forward you are putting a lot of strain through the rotor mast, and it can reach the droop stops. Through constant mishandling it could damage the aircraft.

Once the aircraft has started moving forward re-center the cyclic to the central position using the markers on the PFD and then control the speed with collective. Trim as necessary.

Whilst taxiing ground speed can be monitored on the MFD in a written format, the speed circles and vector will also be visible and can be used.

STOP THE AIRCRAFT FROM A GROUND TAXI

1. To reduce speed and stop, lower the collective and apply pedal brakes.
2. Ensure the cyclic is central.
3. Apply the parking brake.

In order to maneuver the aircraft in any direction other than forwards the **Nose Wheel must be unlocked**. A positive lookout must be maintained whilst maneuvering, paying particular attention to tail clearance from obstacles during turns.

Engage the FTR on the pedals and use left and right pedal inputs to turn the aircraft and some lateral cyclic into the turn in order to maintain a level fuselage attitude. During a crosswind taxi, hold the cyclic into the wind a sufficient amount to eliminate any drifting movement.

CARRY OUT MANOEUVRING WHILST GROUND TAXIING

1. In order to maneuver the aircraft in any direction other than forwards the Nose Wheel must be unlocked. A positive lookout must be maintained whilst maneuvering, paying particular attention to tail clearance from obstacles during turns.
2. Engage the FTR on the pedals (see below) and use left and right pedal inputs to turn the aircraft and some lateral cyclic into the turn in order to maintain a level fuselage attitude.
3. When maneuvering announce “tail clear L/R, nose clear L/R”

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:
   a. Lookout. Confirm tail/nose clearance prior to maneuvers.
   b. Positive division of responsibility between the crew (i.e., to ensure that both are not looking ‘Inside’ at the same time).
   c. Announcement of actions by the PF, e.g., “BRAKING”
   d. Awareness of wind velocity (max crosswind/downwind taxi limits).
   e. Awareness of taxi speed (max speed limits) and turn radius.
   f. Awareness of the ground surface conditions.
   g. Awareness of brake status.
   h. Awareness of Nose Wheel status.
   i. Awareness of Parking Brake status.
   j. Actions in the event of ground resonance.

NOTES FOR THE STUDENT

1. Ensure that you identify and that you are aware of the location of the pedal trims. The correct foot position to taxi comfortably is with your feet on the floor and toes resting lightly on the outside of the pedals. When you need to trim move your toes to the inside of the pedals onto the trim plates and press, this will trim the new pedal position.
2. It is easier to conduct the brake check with your harness in the locked position.
3. During a turn the cyclic may have to be moved laterally if there is any significant wind in order to keep the aircraft attitude level.
4. After stopping apply the nose wheel lock and the parking brake if required.
5. Be aware of the possibility of ground resonance following collective application.

COMMON ERRORS

1. Improper use of cyclic.

2. Failure to use antitorque pedals for heading control.

3. Improper use of the controls during crosswind operations.

4. Failure to maintain proper rpm.

HOVERING TURN

STANDARDS

- Hover Height: 3 feet AGL ± 1 feet
- Rate of Turn: 90 º turn in 4 second.
- Drifting: 1 foot

DEFINITION

A hovering turn is a maneuver performed at hovering altitude in which the nose of the helicopter is rotated either left or right while maintaining position over a reference point on the surface. Hovering turns can also be made around the mast or tail of the aircraft. The maneuver requires the coordination of all flight controls and demands precise control near the surface. A pilot should maintain a constant altitude, rate of turn, and rpm. (4 sec for a 90 degree turn)

1. This exercise is to familiarize with the characteristics of the 109SP. It is an exercise which must be handled well, particularly when maneuvering the aircraft in areas close to obstacles. The trim system must be used correctly to keep the aircraft under control and complete the exercise within the parameters.

2. Spot turns are carried out using the conventional technique of pedal to control rate of turn, cyclic to maintain the turn about a datum point and collective to maintain height. Turns will be conducted about the mast of the aircraft. Awareness of the effect of pedal application upon Tq, particularly at high AUM must be monitored. Where possible turns should be made to left, confirming sufficient power is available and reducing the risk of an over-torque if having to arrest a high rate of turn with opposite pedal. Awareness of the tail in relation to obstacles during spot turns is essential.

3. Sideways and backwards flight should only be used for a short duration when a normal hover taxi in the direction of travel is not appropriate. Limitations associated with the Low-Speed Flight Envelope can be found in the RFM (see below). The exercise will be practiced at low speed (hover taxi). During these maneuvers, particularly at high speed, any harsh pedal inputs (left pedal) can result in large torque spikes beyond aircraft transmission limitations.

TECHNIQUE

Initiate the turn in either direction by applying anti-torque pedal pressure toward the desired direction. It should be noted that during a turn to the left, more power is required because left pedal pressure increases the pitch angle of the tail rotor, which, in turn, requires additional power from the engine. A turn to the right requires less power. (On helicopters with a clockwise rotating main rotor, right pedal increases the pitch angle and, therefore, requires more power.)

As the turn begins, use the cyclic as necessary (usually into the wind) to keep the helicopter over the desired spot. To continue the turn, add more pedal pressure as the helicopter turns to the crosswind position. This is because the wind is striking the tail surface and tail rotor area, making it more difficult for the tail to turn into the wind. As pedal pressures increase due to crosswind forces, increase the cyclic pressure into the wind to maintain position. Use the collective with the throttle to maintain a constant altitude and rpm.

After the 90° portion of the turn, decrease pedal pressure slightly to maintain the same rate of turn. Approaching the 180°, or downwind portion, anticipate opposite pedal pressure due to the tail moving from an upwind position to a downwind position. At this point, the rate of turn has a tendency to increase at a rapid rate due to the tendency of the tail surfaces to weathervane. Because of the tailwind condition, hold rearward cyclic pressure to keep the helicopter over the same spot.

Turns can be made in either direction; however, in a high wind condition, the tail rotor may not be able to produce enough thrust, which means the pilot cannot control a turn to the right in a counterclockwise rotor system. Therefore, if control is ever questionable, first attempt to make a 90° turn to the left. If sufficient tail rotor thrust exists to turn the helicopter crosswind in a left turn, a right turn can be successfully controlled. The opposite applies to helicopters with clockwise rotor systems. In this case, start the turn to the right. Hovering turns should be avoided in winds strong enough to preclude sufficient aft cyclic control to maintain the helicopter on the selected surface reference point when headed downwind. Check the flight manual for the manufacturer's recommendations for this limitation.

CARRY OUT SPOT TURNS

1. The aircraft will be taxied to or hover taxied to a suitable area (some areas require a ground taxi due to FOD), after reaching a "Training Square" position the aircraft in the center, into wind and land.

2. Although the selectable holds are disengaged, the first point to be highlight is the fact that the heading hold is automatically activated in the hover. With feet off the pedals, you will note that the heading will remain constant while the aircraft climbs, descends and moves laterally. However, activation of the FTR will interrupt the heading hold datum.

3. Lift the aircraft to a 3ft hover, to start a slow rotation engage the FTR on the pedals and conduct a ¼ turn in each direction maintaining center position in the training square then land. Failing to engage the FTR on the pedals will result in the aircraft yawing back to the trimmed pedal heading. The heading bug will remain on the pre-selected heading if the pedal FT is not engaged during the maneuver. The MFD and PFD will be displaying the hover page and the speed vector should remain in the center during this maneuver.

4. The same technique is used to conduct a 360° turn but more care needs to be taken to control the rate of turn. It is more difficult to maintain the position and height the faster the turn. The FTR may be engaged on the cyclic and collective in order to maintain the relative ground position or small adjustments can be made against the cyclic spring pressure.

CARRY OUT SPOT TURNS WITH THE USE OF HOLDS

1. The Spot / Lookout Turn. Engage the HOV mode by either 5th axis on the cyclic or the HOV button on the APMS. The symbology will change to the HOV mode on the PFD, displaying the speed circles, speed vectors and heading bug. Height must be above 15ft RAD height to allow engagement of the HOV mode. If you engage and are above 15ft adjust the height back down to 15ft using the beep trim (in the aft direction) on the collective for safety i.e., in case of a single engine failure. Turn using the collective beep trim and note the heading bug movement. Stop the turn on desired heading.

2. The heading and therefore the spot turn can also be conducted by turning the HDG bug on the RBP. This is not the recommended technique for use in the hover as it requires one hand off the controls.

a. If whilst turning the pedal trims are engaged it synchronizes the heading to the current aircraft heading.

b. The same applies when the HDG button is pushed on the RBP.

COMMON ERRORS

1. Failing to maintain a slow, constant rate of turn.

2. Failing to maintain position over the reference point.

3. Failing to maintain rpm within normal range.

4. Failing to maintain constant altitude.

5. Failing to use the antitorque pedals properly.

HOVERING—SIDEWARD FLIGHT

STANDARDS

- Heading: ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting Rearward: ± 2 feet

DEFINITION

1. This exercise is to familiarize with the characteristics of the 109SP. It is an exercise which must be handled well, particularly when maneuvering the aircraft in areas close to obstacles. The trim system must be used correctly to keep the aircraft under control and complete the exercise within the parameters.

2. Spot turns are carried out using the conventional technique of pedal to control rate of turn, cyclic to maintain the turn about a datum point and collective to maintain height. Turns will be conducted about the mast of the aircraft. Awareness of the effect of pedal application upon Tq, particularly at high AUM must be monitored. Where possible turns should be made to left, confirming sufficient power is available and reducing the risk of an over-torque if having to arrest a high rate of turn with opposite pedal. Awareness of the tail in relation to obstacles during spot turns is essential.

3. Sideways flight should only be used for a short duration when a normal hover taxi in the direction of travel is not appropriate. Limitations associated with the Low-Speed Flight Envelope can be found in the RFM (see below). The exercise will be practiced at low speed (hover taxi). During these maneuvers, particularly at high speed, any harsh pedal inputs (left pedal) can result in large torque spikes beyond aircraft transmission limitations.

TECHNIQUE

PERFORM SIDEWAYS MOVEMENT

1. Lift the aircraft again into a 3ft hover and perform a complete square at a constant heading (into wind). Forward to the edge of the square, then right to the corner, backward to the rear corner, sideway to the left corner, forward to the upper corner, then right and back to the center and land.

2. Low speed sideways flight is carried out as follows

Sideways. Lookout and confirm the area planned to be move into is clear of obstacles. Displace the cyclic against spring pressure in the required direction of travel. As the aircraft accelerates laterally, maintain height with collective (engage the FTR) and heading with pedals (with ATT ON, heading hold will remain active). Use external cues and MFD hover mode symbology to monitor parameters, control speed with cyclic and monitor Tq. To return to the hover relax the pressure on the cyclic and the aircraft will reselect the hover attitude, once in the hover trim. Using the beep trim to maneuver sideways is also an option (try both techniques).

PERFORM SIDEWAYS MOVEMENT WITH THE USE OF HOLDS

1. The HOV mode is used for this maneuver and the main reference for velocity and direction is the PFD or MFD hover mode display.

2. Using the beep trim on the collective the aircraft's position can be maneuvered in any direction. The speed vector will show the trend and the magenta circle will display the direction selection. There is a digital readout on the MFD which shows the actual ground speed. Note that this is GS in any direction.

3. Practice maneuvering the aircraft as per the sideways exercise using the collective beep trim.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:
   - a. Lookout and situational awareness.
   - b. Monitoring: Wind velocity and Torque.
   - c. Ground Clearance.
   - d. Checks.

NOTES FOR THE STUDENT

1. Take care not to over control during this maneuver. It is easy to "pump" the collective when the FTR is engaged. If this happens release the FT and come to the hover.

2. Try to visually judge the correct height by either using the backdrop technique or by focusing on s well ahead of the aircraft.

3. Maintain good lookout at all times for obstructions or other aircraft.

4. When using the automation, it is important at all times to have an awareness of the state of the intended or projected flight profile.

COMMON ERRORS

1. Exaggerated movement of the cyclic, resulting in overcontrolling and erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to make sure the area is clear prior to starting

HOVERING—REARWARD FLIGHT

STANDARDS

- Heading: ± 10 °
- Hover Height: 10 feet AGL (± 1 feet)
- Drifting: 1 foot

DEFINITION

Rearward hovering flight may be necessary to move the helicopter to a specific area when the situation is such that forward or sideward hovering flight cannot be used. During the maneuver, maintain a constant groundspeed, altitude, and heading. Due to the limited visibility behind a helicopter, it is important that the area behind the helicopter be cleared before beginning the maneuver. Use of ground personnel is recommended.

1. This exercise is to familiarize with the characteristics of the 109SP. It is an exercise which must be handled well, particularly when maneuvering the aircraft in areas close to obstacles. The trim system must be used correctly to keep the aircraft under control and complete the exercise within the parameters.

2. Spot turns are carried out using the conventional technique of pedal to control rate of turn, cyclic to maintain the turn about a datum point and collective to maintain height. Turns will be conducted about the mast of the aircraft. Awareness of the effect of pedal application upon Tq, particularly at high AUM must be monitored. Where possible turns should be made to left, confirming sufficient power is available and reducing the risk of an over-torque if having to arrest a high rate of turn with opposite pedal. Awareness of the tail in relation to obstacles during spot turns is essential.

3. Backwards flight should only be used for a short duration when a normal hover taxi in the direction of travel is not appropriate. Limitations associated with the Low-Speed Flight Envelope can be found in the RFM (see below). The exercise will be practiced at low speed (hover taxi). During these maneuvers, particularly at high speed, any harsh pedal inputs (left pedal) can result in large torque spikes beyond aircraft transmission limitations.

TECHNIQUE

PERFORM BACKWARDS MOVEMENT

1. Lift the aircraft again into a 3ft hover and perform a complete square at a constant heading (into wind). Forward to the edge of the square, then right to the corner, backward to the rear corner, sideway to the left corner, forward to the upper corner, then right and back to the center and land.

2. Low speed rearwards flight is carried out as follows

Backward. Maneuvering backwards should only be carried out over short distances, and only when turning and when hover taxiing forward is not appropriate. Having ensured that the area behind is clear increase the height to ensure adequate tail rotor clearance. Then initiate movement with aft cyclic against spring pressure to achieve a slow walking pace. Maintain height with collective and heading with pedals (with the ATT ON, heading hold will remain active). Use external cues and MFD hover mode symbology, monitor parameters, control speed with cyclic and monitor Tq. To return to the hover relax the pressure on the cyclic, reselect the hover attitude, once in the hover trim.

PERFORM SIDEWAYS AND BACKWARDS MOVEMENT WITH THE USE OF HOLDS

1. The HOV mode is used for this maneuver and the main reference for velocity and direction is the PFD or MFD hover mode display.

2. Using the beep trim on the collective the aircraft's position can be maneuvered in any direction. The speed vector will show the trend and the magenta circle will display the direction selection. There is a digital readout on the MFD which shows the actual ground speed. Note that this is GS in any direction.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout and situational awareness.

   b. Monitoring: Wind velocity and Torque.

   c. Ground Clearance.

   d. Checks.

NOTES FOR THE STUDENT

1. Take care not to over control during this maneuver. It is easy to “pump” the collective when the FTR is engaged. If this happens release the FT and come to the hover.

2. Try to visually judge the correct height by either using the backdrop technique or by focusing on s well ahead of the aircraft.

3. Maintain good lookout at all times for obstructions or other aircraft.

4. When using the automation, it is important at all times to have an awareness of the state of the intended or projected flight profile. Before starting rearward hovering flight, pick out two reference points in front of, and in line with the helicopter just like hovering forward. The movement of the helicopter should be such that these points remain in line.

Begin the maneuver from a normal hovering altitude by applying rearward pressure on the cyclic. After the movement has begun, position the cyclic to maintain a slow groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain constant groundspeed and ground track with the cyclic, a constant heading with the antitorque pedals, constant altitude with the collective, and the proper rpm with the throttle.

To stop the rearward movement, apply forward cyclic and hold it until the helicopter stops. As the motion stops, return the cyclic to the neutral position. Also, as in the case of forward and sideward hovering flight, opposite cyclic can be used to level the helicopter and let it drift to a stop. Tail rotor clearance must be maintained. Generally, a higher-than normal hover altitude is preferred.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:
   - a. Lookout and situational awareness.
   - b. Monitoring: Wind velocity and Torque.
   - c. Ground Clearance.
   - d. Checks.

NOTES FOR THE STUDENT

1. Take care not to over control during this maneuver. It is easy to “pump” the collective when the FTR is engaged. If this happens release the FT and come to the hover.

2. Try to visually judge the correct height by either using the backdrop technique or by focusing on s well ahead of the aircraft.

3. Maintain good lookout at all times for obstructions or other aircraft.

4. When using the Automation, it is important at all times to have an awareness of the state of the intended or projected flight profile.

COMMON ERRORS

1. Exaggerated movement of the cyclic resulting in overcontrolling and an uneven movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to make sure the area is clear prior to starting the maneuver.

HOVER OGE (OUT OF GROUND EFFECT) CHECK

STANDARDS

- Drift: ±10 Ft.
- Establishing a hover altitude at 100 Feet or above surrounding obstacles.
- Heading: ±10°
- Maintaining a constant rate of turn when making a 360° left turn.
- Accurate determination of aircraft power and controllability for maneuvers requiring OGE HOVER power.
- Within automation tolerances.

DEFINITION

An OGE Check can be performed at any time when there is a question mark about the control or power of the aircraft.

Altitude vertically to 100 feet or on top of surrounding obstacles, whichever is higher. The helicopter's engine instruments are constantly observed. The limits of the aircraft are not exceeded. A 360 degree left/right turn is made while continuously checking the power and control of the aircraft. The maneuver is finished at ground effect or at the desired height.

1. To have the ability to hover outside ground effect is a fundamental part of the function of a helicopter. It affords flexibility and can be used operationally in SAR, camera surveillance and covert operations at high levels. It is an advanced maneuver but has the potential of danger if it is not monitored or if it is mishandled. Hovering OGE is defined as maintaining a constant height and heading over a given ground position.

2. Before conducting this maneuver you must be aware of the dangers of Vortex Ring. The insipient signs, criteria required for entering into the Vortex Ring State and the recovery action.

3. Before flight and before conducting the maneuver ensure that the aircraft performance has been calculated with the use of the RFM and that you have a 10% power margin. This is needed to maintain the hover OGE and allow sufficient Tq to arrest any small ROD.

4. If the NR is set in AUTO the NR will automatically go to 102NR when the groundspeed < 75kts. However, if conducting the hover OGE over land for training the aircraft is configured for landing.

MAINTAIN A HOVER OUTSIDE GROUND EFFECT WITHOUT THE USE OF HOLDS

1. From 80 KIAS and at a height above 1000ft AGL start to decelerate the aircraft using either the cyclic beep trim or FTR (approx. 10° nose up). At the same time maintain altitude, monitor and confirm using the VSI. As the airspeed reduces to below 30 KIAS anticipate the loss of translational lift and apply power to 5% more than was required hovering IGE. By doing this it will ensure that a ROD doesn’t occur that cannot be arrested.

2. As the speed reduces further it is important to monitor the ground speed (displayed on the MFD), because the KIAS are inaccurate at low speeds. Picking external markers will make it easier to maintain a ground position and asses any sideways or backwards drift. As the ground speed reduces to 0kts monitor the VSI very closely. DO not allow a ROD to build up more than 500ft/min. (if it does then abort the hover, fly away and reset). The power required to hover OGE will be between 5-10% more than IGE (depending on wind and turbulence).

4. To maintain the hover trim all the controls and just make small adjustments with cyclic against spring pressure to maintain the ground position. The HDG hold will be active automatically so you can relax on the pedals and the aircraft heading will be maintained.

VORTEX RING

1. Below is a refresher on vortex ring.
    a. Requirements.
        i. Power applied.
        ii. High ROD > 500ft/min.
        iii. Low airspeed < 30 kts.
    b. Characteristics and indications of incipient vortex ring.
        i. Vibration.
        ii. Increased ROD without adjustment of the collective.
        iii. Cyclic irresponsive.
    c. Recovery action in the event of insipient or full vortex ring. (Take away one of the parameters). Preferably in this order.
        i. Lower the collective (if height permits) to MPOG.
        ii. Forward cyclic to gain forward speed above 30kts.
2. Once the aircraft is responding as normal regain the height and speed and fly away.

MAINTAIN A HOVER OUTSIDE GROUND EFFECT WITH THE USE OF HOLDS

1. Use the same technique as above but as the airspeed comes below 30 KIAS push the 5th axis of the cyclic beep trim to engage the HOV mode.

2. ***WARNING***.

a. When using the HOV hold ensure that the ground underneath the aircraft is completely flat as the altitude maintained is RAD height (RHT if below 2500ft AGL). Any drift or movement of the aircraft over undulating terrain will cause the aircraft to climb or descend to try to maintain the height. This will move the collective abruptly and can put the aircraft into a vortex ring configuration.

b. If there is any doubt about the terrain underneath then the RHT hold can be disengaged, and the altitude maintained manually with the collective Tq or ALT can be engaged enabling the aircraft to automatically maintain altitude from the BAR Alt.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose a suitable area for recovery of vortex ring or aborted hover.

e. Carry out all the relevant checks.

NOTES FOR THE STUDENT

1. Pick markers to maintain ground position.
2. Remember that the displayed groundspeed is in any direction.
3. React promptly to any signs of high ROD or Vortex Ring.
4. Monitor the automation in use.
5. The HOGE is normally performed into wind for power and controllability reasons, however sometimes it is beneficial to put the wind slightly off the 12 O'clock position and "lean into" the wind for stability.

COMMON ERRORS

- Not being able to maintain high hover altitude.
- Inability to prevent drifts.

NORMAL TAKEOFF FROM A HOVER

STANDARDS

- Before Take Off Checks
- Cyclic acceleration: -10°± 1°
- Power Regulation: ± % 3
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

A normal takeoff from a hover is an orderly transition to forward flight and is executed to increase altitude safely and expeditiously. During the takeoff, fly a profile that avoids the cross-hatched or shaded areas of the height-velocity diagram.

CAT B

1. This exercise introduces the fundamentals of basic CAT B transitions to and from forward flight. The transitions will normally be linked with an appropriate circuit pattern.

2. Making appropriate use of external markers and visual cues will aid both accuracy (aircraft attitude/ground track etc.) and position maintenance (hovering). You will be encouraged to make full and correct use of the various modes of MFD, and PFD symbology presented to you.

CAT A

1. CAT "A" operations of the AW109SP take into account that in the event of a single engine failure at any time after the start of the Take-Off transition, it will ensure the helicopter has the capability of:

a. At or prior to the Take-Off Decision Point (TDP), to return and safely land back on the Take-Off area.

b. At or after the Take-Off Decision Point (TDP), climb away from the point of engine failure and continue forward flight with one engine inoperative (OEI).

The same applies to the CAT "A" Approach, that in the event of a single engine failure at any time during the approach to landing, it will ensure the helicopter has the capability of:

c. At or after the Landing Decision Point (LDP), to make a safe approach and landing on the intended landing area

d. At or prior to the Landing Decision Point (LDP), climb away from the point of engine failure and continue flight with one engine inoperative (OEI).

2. Your instructor will give a detailed long briefing on Cat "A" operations as necessary to explain all relevant information on the meaning of flying Cat "A" profiles, including WAT charts, limitations etc.

TECHNIQUE

CARRY OUT A STANDARD CAT B TAKEOFF FROM THE HOVER

1. The Open Field Take Off should be a gentle and constant transition from the hover IGE to a climb at an assigned speed (Vy) 80 KIAS and altitude.

2. It is important that the aircraft's longitudinal axis is maintained and kept aligned with your ground track during the initial part of the transition by cross controlling until above V2 (35 KIAS). This will allow a safe run on landing should it be required during the takeoff, for example after a OEI condition before TDP

3. Note the Tq and engage the FTR on the collective, pedals and cyclic. Adopt an approx. 10° nose down attitude change from the hover attitude (The SP generally hovers 5° nose up so an indicated attitude of 5° nose down should be used). As the aircraft accelerates maintain height with collective. As you experience the transitional forces (flap back, inflow roll and translational lift) maintain the accelerative attitude, adjust to approx. 0° attitude and release the FT. Allow the aircraft to climb and apply approximately 15% Tq above hover power with the collective. Making full use of the FTR during the maneuver will reduce cyclic spring forces and will allow you to maintain the correct attitude throughout the maneuver. Adopt balanced flight as you pass through V2, release the FT on the pedals and continue to accelerate to achieve Vy 80 KIAS. Trim the cyclic beep trim to maintain Vy, then adjust collective to achieve desired ROC (approx. 500ft/min). Once established on parameters trim the aircraft to a stable climb.

4. Conduct the after-takeoff checks.

Landing gear lever: UP (after 200ft RAD ALT.

MAIN UTIL CHRG caution message is displayed during landing gear retraction, and then clears when landing gear is locked.

Confirm landing gear is up and locked (3 green lights and red light extinguished).

Note: If flight operations require the landing gear to be down at all times, then NR must be selected manually, using the NR switch, when appropriate.

NR/N2 Confirm N2 / NR stabilizes at 100%.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.

b. Monitoring:

i. Airspeed and ROD (Vortex Ring considerations).

ii. Wind velocity.

iii. Torque.

c. Checks.

d. RFM limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Confirm with the RAD HT on the MFD/PFD to assist in height keeping during the hover. It is however better to visually judge the hover height.

3. Before V2 maintain a forward ground track, minimize any lateral movement. Maintain balance whilst in forward flight after V2, turn co-ordination will be automatically engaged above 40 KIAS and disengaged as the IAS < 40 KIAS on finals.

4. Use the correct approach angle and maintain the centerline on finals.

5. Make all control actions smooth.

6. When descending below 200ft AGL vocal message “TWO HUNDRED FEET” is active regardless landing gear status.

7. The message “Landing Gear” activates at 200ft if the landing gear is not down, this message is suppressed if AWG switch is set to REGRADE.

CAT “A” CLEAR AREA TAKEOFF

CONDUCT A CAT “A” CLEAR AREA TAKEOFF

GENERAL DATA - VY (80 KIAS)

TAKE-OFF DECISION POINT (TDP)

Height...20ft (6.1 m) AGL

Airspeed (V1) .... 20 KIAS

1. Conduct the before takeoff checks and lift into a 3ft hover. Note the Tq and HRZ SYNC in PFD menu. Press HS on to indicate zero (0 deg) pitch.

2. Engage the FTR on the collective, cyclic and pedals and increase the Tq by 15% ±5%. Select 15° nose down attitude. Maintain for about 2 seconds and then reduce the nose down attitude to approx. 10°.

3. At Take-Off Decision Point (TDP) 20 KIAS / 20 ft continue acceleration to VTOSS (35 KIAS). At this point it is important to adjust the attitude (5–10 °) to maintain 35 KIAS and allow the aircraft to climb to 200ft AGL. (PATH 1)

4. Once at 200ft AGL release the FT on the cyclic and using the beep trim adjust the attitude to accelerate to Vy (80 KIAS). Select the appropriate power for the climb and adjust for balanced flight then release the pedal and collective FT and continue to climb to 1000ft (or as required).

5. Conduct the after-Takeoff checks.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.

   b. Monitor fuel and engine instruments.

   c. Monitor the wind velocity.

   d. Choose clear climb out and approach paths.

   e. Carry out all the relevant checks.

   f. RFM engine and Tq limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Remember to pick markers before takeoff and for the final approach.

3. Confirm with the RAD HT on the MFD/PFD to assist in height keeping during the transition to and from the hover and to confirm TDP and LDP.

4. Before V2 during the transition maintain a forward ground track, minimizing any lateral movement. Maintain balance whilst in forward flight after V2, turn co-ordination will be automatically engaged above 40 KIAS and on finals automatically deactivated below 40 KIAS.

5. Maintain lookout and SA during the transitions.

6. Use the correct approach angle and maintain the centerline on finals.

7. Make use of the FPM (flight path marker) to assist in assessing the final landing point

COMMON ERRORS

1. Failing to use sufficient collective pitch to prevent loss of altitude prior to attaining translational lift.

2. Adding power too rapidly at the beginning of the transition from hovering to forward flight without forward cyclic compensation, causing the helicopter to gain excessive altitude before acquiring airspeed.

3. Assuming an extreme nose-down attitude near the surface in the transition from hovering to forward flight.

4. Failing to maintain a straight flightpath over the surface (ground track).

5. Failing to maintain proper airspeed during the climb.

6. Failing to adjust the throttle to maintain proper rpm.

7. Failing to transition to a level crab to maintain ground track.

NORMAL APPROACH TO A HOVER

STANDARDS

- Maintaining Initial Standards: 300 feet ± 50 feet
- 80 Kt. ± 10 Kt.
- Maintaining Landing Decision Point: 70 feet ± 10 feet
  50 Kt. ± 5 Kt.
- Approach Angle: Normal Approach Angle
- Ground Track: ± 10 °
- Transition to Hover: 3 feet ± 1 feet

DEFINITION

An approach is the transition from traffic pattern altitude to either a hover or to the surface. The approach should terminate at the hover altitude with the rate of descent and groundspeed reaching zero at the same time. Approaches are categorized according to the angle of descent as normal, steep, or shallow. In this chapter, concentration is on the normal approach. Steep and shallow approaches are discussed in the next chapter. Use the type of approach best suited to the existing conditions. These conditions may include obstacles, size and surface of the landing area, density altitude, wind direction and speed, and weight. Regardless of the type of approach, it should always be made to a specific, predetermined landing spot.

CAT B

1. This exercise introduces the fundamentals of basic CAT B transitions to and from forward flight. The transitions will normally be linked with an appropriate circuit pattern.

2. Making appropriate use of external markers and visual cues will aid both accuracy (aircraft attitude/ground track etc) and position maintenance (hovering). You will be encouraged to make full and correct use of the various modes of MFD and PFD symbology presented to you.

CAT A

1. CAT “A” operations of the AW109SP take into account that in the event of a single engine failure at any time after the start of the Take-Off transition, it will ensure the helicopter has the capability of:

a. At or prior to the Take-Off Decision Point (TDP), to return and safely land back on the Take-Off area.

b. At or after the Take-Off Decision Point (TDP), climb away from the point of engine failure and continue forward flight with one engine inoperative (OEI).

The same applies to the CAT “A” Approach, that in the event of a single engine failure at any time during the approach to landing, it will ensure the helicopter has the capability of:

c. At or after the Landing Decision Point (LDP), to make a safe approach and landing on the intended landing area

d. At or prior to the Landing Decision Point (LDP), climb away from the point of engine failure and continue flight with one engine inoperative (OEI).

2. Your instructor will give a detailed long briefing on Cat “A” operations as necessary to explain all relevant information on the meaning of flying Cat “A” profiles, including WAT charts, limitations etc.

TECHNIQUE

CARRY OUT A STANDARD CAT B APPROACH TO THE HOVER

1. The Open Field Approach should be conducted as a Constant Angle Approach, it is a technique that you are already conversant with and just need to be familiarized with the required ‘sight picture’ in the AW109SP. Remember that a constant angle is exactly as the term suggests; so even a vertical approach (high to low hover) fulfils the criteria.

2. Confirm the aircraft is in the landing configuration:

The final approach checklist:

Landing Gear: DWN 3 GREEN Check light sequence: red light on (extension)

: Red light off

: Green light on (extended and locked)

Park Brake: AS REQ

Nose wheel lock: ON

Landing Lights: AS REQ

NR/NF: CK 102% below 75KIAS

Limiter On: AS REQ

Warning/ Caution Lights: CK

Cabin: SECURE

3. Once the aircraft is lined up with the landing point, at 500ft QFE. The airspeed should now be adjusted from 80 KIAS to 50 KIAS + wind speed. Balanced flight is maintained until V2 (35 KIAS) (Note that the aircraft heading may not be the same as the runway heading if there is any crosswind component) then cross control maintaining heading with pedal and stopping any drift with cyclic as required in order to stay aligned with the runway center line and runway direction.

4. To carry out the approach. As the required ‘sight picture’ is intercepted, engage the FTR and lower the collective. Adopt a decelerative attitude with the beep trim, between 5-10° nose up and adjust to maintain a speed reduction but not less than 30 KIAS.

Adjust the collective to maintain the touchdown point in the desired ‘sight picture’ looking out laterally to assess approach speed (using cyclic to adjust). The Flight Path Marker on the PFD will also enhance visualization of the approach paths likely touchdown point (see below). There should be no reason for your ROD to exceed 500ft/min. Engage the FTR on the cyclic at some stage during the approach and at 70ft AGL continue to decelerate through 30 KIAS. Anticipate the requirement for increased power as translational lift is lost, aligning the aircraft (longitudinally) with ground track as you decelerate through V2 (35 KIAS) facilitating a favorable condition to run-on during an emergency.

Bring the helicopter to a hover at 3ft AGL.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.

   b. Monitoring:

i. Airspeed and ROD (Vortex Ring considerations).

ii. Wind velocity.

iii. Torque.

c. Checks.

d. RFM limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Confirm with the RAD HT on the MFD/PFD to assist in height keeping during the hover. It is however better to visually judge the hover height.

3. Before V2 maintain a forward ground track, minimize any lateral movement. Maintain balance whilst in forward flight after V2, turn co-ordination will be automatically engaged above 40 KIAS and disengaged as the IAS < 40 KIAS on finals.

4. Use the correct approach angle and maintain the centerline on finals.

5. Make all control actions smooth.

6. When descending below 200ft AGL vocal message “TWO HUNDRED FEET” is active regardless landing gear status.

7. The message “Landing Gear” activates at 200ft if the landing gear is not down, this message is suppressed if AWG switch is set to REGRADE.

CAT “A” CLEAR AREA APPROACH

CONDUCT A CAT “A” CLEAR AREA APPROACH.

GENERAL DATA - VY (80IAS)

TAKE-OFF

LANDING DECISION POINT (LDP)

Height...80ft 24.4m) AGL

Airspeed ....(V1) 25KIAS

Rate of Descent ....500 ± 100ft/min

Note: The heights shown in flight path profiles refer to radio altimeter.

1. Ensure that the before landing checks have been conducted and set up on finals as per normal circuits and open field approach. Using the same trim technique as open field approach, engage the FTR on the collective, cyclic and pedals at some stage just before LDP.

2. During the approach calculate the speed and approach angle to pass through the LDP at 80ft (ALS) above the landing site at 25 KIAS with a rate of descent no higher than 500 ± 100ft/min. Anticipate the requirement for increased power as translational lift is lost, aligning the aircraft (longitudinally) with ground track as you decelerate facilitating a favorable condition to run-on during an emergency.

From the LDP reduce airspeed and decrease the rate of descent to achieve a hover at approximately 3ft (1 m) ALS. Trim to the hover as required and descend vertically to land.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose clear climb out and approach paths.

e. Carry out all the relevant checks.

f. RFM engine and Tq limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control.
2. Remember to pick markers before takeoff and for the final approach.
3. Confirm with the RAD HT on the MFD/PFD to assist in height keeping during the transition to and from the hover and to confirm TDP and LDP.
4. Before V2 during the transition maintain a forward ground track, minimizing any lateral movement. Maintain balance whilst in forward flight after V2, turn co-ordination will be automatically engaged above 40 KIAS and on finals automatically deactivated below 40 KIAS.
5. Maintain lookout and SA during the transitions.
6. Use the correct approach angle and maintain the centerline on finals.
7. Make use of the FPM (flight path marker) to assist in assessing the final landing point.

COMMON ERRORS

1. Failing to maintain proper rpm during the entire approach.
2. Improper use of the collective in controlling the angle of descent.
3. Failing to make antitorque pedal corrections to compensate for collective changes during the approach.
4. Maintaining a constant airspeed on final approach instead of an apparent brisk walk.
5. Failing to simultaneously arrive at hovering altitude and attitude with zero groundspeed.
6. Low rpm in transition to the hover at the end of the approach.
7. Using too much aft cyclic close to the surface, which may result in tail rotor strikes.
8. Failure to crab above 100’AGL and slip below 100’AGL

MAXIMUM PERFORMANCE TAKEOFF (STEEP TAKEOFF)

STANDARDLAR

- Before Take Off Checks
- Accelerating Cycling (Attitude): -10°± 1°
- Power Setting: Until 30 Feet + % 3
- Altitude: 100 feet ± 10 feet
- Heading: ± 10°
- Ground Track: ± 10 feet
- Maintaining aircraft limitations with simulated obstructions.

DEFINITION

1. This serial will introduce the techniques that may be adopted to cater for terrain restrictions that prohibit the use of more conventional transition and approach techniques.

2. It is important to understand the difference between Power Margin and Thrust Margin.

a. Power Margin. Power margin is the difference between max Tq available and the actual Tq being used for a specific maneuver (e.g. in a 10ft hover at 97%Tq with 100% being max continuous Tq available – Power margin is (+)3%. If to hover at 3ft it is calculated that 103% Tq is required, but 100% is the max continuous available – Power margin is (-) 3%).

b. Thrust Margin. Thrust margin is also a margin of power, but expressed as a percentage of a relative weight. The minimum Thrust margin required is dependent on the environment, for example when operating in mountainous terrain a minimum of 10% is generally used to ensure sufficient power is available to allow OGE operations and overcome light turbulence.

TECHNIQUE

CONDUCT A STEEP TAKEOFF

1. There must be at least 20% excess power margin to perform a steep take off; otherwise the maneuver cannot be conducted. If there is not a 20% power margin it is difficult to achieve correct speed (35 KIAS) at the correct height (300ft).

2. The departure should be initiated from a hover, after completing a power check to confirm hover Tq + 20% available. Engage the FTR on the collective and increase power by 20% Tq. Engage the FTR on the pedals and the cyclic and adopt an accelerative attitude of only a couple of degrees change from the hover attitude in order to reach 300ft at 35 KIAS (V2) simulating an obstacle height of 200ft (100ft clearance = 300ft). If 35 KIAS is reached before 300ft AGL maintain the speed by selecting a speed stable attitude.

3. When clear of obstacles maintain the power but adjust the attitude to accelerate the aircraft to Vy (80kts). On reaching Vy the power can be reduced to attain the desired ROC. Trim for a stable climb to 1000ft or as required.

NOTE: The 100 feet used as the vertical take-off altitude in this movement is for training purposes. In case of an obstacle in the take-off direction, the decision point obstacle height is applied as + 100 feet.

Take-off on the Side Wind: It opens into the cyclic wind enough to maintain the ground track until the transitional lift is gained, and enough opposing pedal control is given to ensure the parallelism of the hull with the ground track. After this point, the helicopter is put into the trim and the ground track continues to be kept cyclically.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout and awareness of obstructions.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Power requirements.

e. Rate of climb limitations.

f. RFM Tq limitations.

g. Carry out all the relevant checks.

h. Power margins.

NOTES FOR THE STUDENT

1. During the transition, if excessive forward cyclic is selected the aircraft will not climb at the desired ROC and once ground effect has been lost (approx. 2/3 of rotor diameter) the power required to clear the obstructions will increase.

2. During the steep approach be aware of having an approach speed too high resulting in excessive ROD to maintain approach angle. If the ROD becomes too high reduce speed in order to increase the descent angle. However, airmanship prevails and overshoot if required.

3. As above during the approach be aware that if the approach angle too steep (poor over nose visibility, high power low airspeed). There may be a need to yaw the aircraft to have better visibility.

4. Use the correct approach angle and maintain the centerline on finals.

COMMON ERRORS

1. Failure to consider performance data, including height/ velocity diagram.

2. Nose too low initially causing horizontal flight rather than more vertical flight.

3. Failure to maintain maximum permissible rpm.

4. Abrupt control movements.

5. Failure to resume normal climb power and airspeed after clearing the obstacle.

STEEP APPROACH TO HOVER, SHALLOW APPROACH

STANDARDS

- Before Landing Checks
- Establishment of Initial Standards: 300 feet ± 50 feet
  50 Kt. ± 5 Kt.
- Establishing Landing Decision Point: 100 feet ± 10 feet
- Angle: Steep Approach Angle
- Ground Track: ± 10 °
- Transition to Hover: 3 feet ± 1 feet
- Maintaining aircraft limitations with simulated obstructions.

DEFINITION

1. This serial will introduce the techniques that may be adopted to cater for terrain restrictions that prohibit the use of more conventional transition and approach techniques.

2. It is important to understand the difference between Power Margin and Thrust Margin.

a. Power Margin. Power margin is the difference between max Tq available and the actual Tq being used for a specific maneuver (e.g. in a 10ft hover at 97%Tq with 100% being max continuous Tq available – Power margin is (+)3%. If to hover at 3ft it is calculated that 103% Tq is required, but 100% is the max continuous available – Power margin is (-) 3%).

b. Thrust Margin. Thrust margin is also a margin of power, but expressed as a percentage of a relative weight. The minimum Thrust margin required is dependent on the environment, for example when operating in mountainous terrain a minimum of 10% is generally used to ensure sufficient power is available to allow OGE operations and overcome light turbulence.

TECHNIQUE

CONDUCT A STEEP APPROACH

1. A steep approach angle is considered to be around 15°.Low speed steep approaches (around 20kts) and vertical descent maneuvers, should be performed with a rate of descent not exceeding 900ft/min.

2. After performing before landing and final checks, the aircraft should level off on finals at or above 300ft AGL and the speed reduced to 40 KIAS + W/V i.e.40kts ground speed.

3. When you visualize the flight path for a steep approach engage the FTR on the collective and reduce power to initiate a descent. Using the beep trim or FTR on the cyclic adopt a declarative attitude of around 5°-7°. Closely monitor and control the rate of descent with collective and control speed with cyclic to maintain a constant and declarative angle of approach.

4. As the aircraft passes through approx. 80ft AGL confirm ROD and power available then gradually increase the collective to reduce ROD. Engage the FTR on the cyclic and continue to reduce speed and ROD. Forward speed and ROD should be reduced smoothly and at the same time until the ac experiences a loss of translational lift but acquires the benefit of ground effect and the aircraft stabilizes in a normal hover

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout and awareness of obstructions.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Power requirements.

e. Rate of climb limitations.

f. RFM Tq limitations.

g. Carry out all the relevant checks.

h. Power margins.

NOTES FOR THE STUDENT

1. During the transition, if excessive forward cyclic is selected the aircraft will not climb at the desired ROC and once ground effect has been lost (approx. 2/3 of rotor diameter) the power required to clear the obstructions will increase.

2. During the steep approach be aware of having an approach speed too high resulting in excessive ROD to maintain approach angle. If the ROD becomes too high reduce speed in order to increase the descent angle. However, airmanship prevails and overshoot if required.

3. As above during the approach be aware that if the approach angle too steep (poor over nose visibility, high power low airspeed). There may be a need to yaw the aircraft to have better visibility.

4. Use the correct approach angle and maintain the centerline on finals.

SHALLOW APPROACH

1. A shallow approach normally, but not necessarily, concludes in a rolling landing. This maneuver is also used when a lower-than-normal rate of descent is desired, i.e. landing with Servo 1 failure (real or simulated), SAS failure, Engine failure, Engine Gov in Manual mode, etc.

2. Approach angles:

An approach angle of 3° is considered to be shallow for a VFR approach.

CARRY OUT A SHALLOW APPROACH

1. Conduct the Before Landing checks at a suitable time as per a normal approach, IAW the Normal Checklist.

2. On finals at 80 KIAS but further away from the intended touchdown point than a normal approach (approx. 1nm) starts a rate of decent using the technique mnemonic T - PAT Engage the FTR on the collective and set power to give a ROD of approx. 300ft/min. Adjust the attitude with the cyclic beep trim to a gentle decelerative attitude of approximately 5-7° nose up. Now check balance and trim if required. Monitor approach profile angle and adjust flight path as necessary, controlling the rate of deceleration with cyclic and maintaining a constant rate of descent of about 200-300ft/min in order to arrive at the desired touchdown point.

3. To help assess a 3° glide slope you can use the VFR APP mode from the FMS. This will then display a vertical indication of the glideslope. Remember to set the desired descent angle on the RBP.

4. Aim to go through an imaginary “gate” on short finals at 200ft and 60 KIAS with no more than 500ft/min ROD.

5. Utilize the Flight Path Marker (FPM) on the PFD to help judge the final touchdown point. Simply position it on the point you wish to land at either over the runway threshold or waypoint fix.

6. Once through the “gate” continue on the approach path and continue to decelerate until below 40 kts ground speed. At this point you are within the aircraft undercarriage limits to conduct a running landing if necessary. Use the technique described in that chapter for the running landing.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose clear approach paths.

e. Carry out all the relevant checks.

f. Conform to ATC and R/T procedures for landing.

NOTES FOR THE STUDENT

1. Use the correct approach angle and maintain the centerline on finals.

2. Try to make a progressive deceleration. This will make it easier to maintain a constant angle approach.

COMMON ERRORS

1. Failing to maintain proper rpm during the entire approach.

2. Using collective improperly in maintaining the selected angle of descent.

3. Failing to make antitorque pedal corrections to compensate for collective pitch changes during the approach.

4. Slowing airspeed excessively in order to remain on the proper angle of descent.

5. Failing to determine when effective translational lift is being lost.

6. Failing to arrive at hovering altitude and attitude, and zero groundspeed almost simultaneously.

7. Utilizing low rpm in transition to the hover at the end of the approach.

8. Using too much aft cyclic close to the surface, which may result in the tail rotor striking the surface.

9. Failure to align landing gear with direction of travel no later than beginning of loss of translational lift.

TRAFFIC PATTERNS

STANDARDLAR

- Airspeed: ± 5 Kt.
- Altitude: ± 50 feet
- Turn Angle: 15° ± 5°

DEFINITION

1. The standard training circuit combines most of the skills learnt in the previous exercises. However, it is important that you do not let the need for accuracy result in a poor lookout, as there may be other aircraft in the circuit, aircraft joining visually or perhaps instrument traffic, which in some cases, may be approaching to a different runway. There are new displays, symbology, methods of trim system and holds which will be unfamiliar so airmanship is vital as there may be more of a tendency to be “heads in” until familiar with the cockpit and control switches layout. Your instructor will be aware of this hazard in the training environment.

2. Making appropriate use of external markers and visual cues will aid accuracy in the circuit and hovering. Students will need to use the trim system correctly and will be encouraged to use the FD when manual flying is achieved in order to reduce pilot workload and aid accuracy.

TAKE-OFF TO THE HOVER, FLY A STANDARD TRAINING CIRCUIT, RETURN TO A PRE-SELECTED HOVER/LANDING POINT AND LAND WITHOUT THE USE OF HOLDS

1. The standard training circuit is shown in diagrammatic form (see below). Although mainly self-explanatory, there are a few points which need emphasizing:

a. The Lookout Turn. The lookout turn should be through 180°, this ensures that the approach path is clear, that no aircraft are overflying, and it also enables you to select final approach path markers, especially when flying circuits away from a runway, for example circuits to a helipad.

b. The Transition. It is important that the aircraft’s longitudinal axis is maintained and kept aligned with your ground track during the initial part of the transition by cross controlling until above V2 (35 KIAS). This will allow a safe run on landing should it be required during the takeoff, for example after a OEI condition before TDP, note the Tq and engage the FTR on the collective, pedals and cyclic. Adopt an approx. 10° nose down attitude change from the hover attitude (The SP generally hovers 5° nose up so an indicated attitude of 5 ° nose down should be used). As the aircraft accelerates maintain height with collective. As you experience the transitional forces (flap back, inflow roll and translational lift) maintain the accelerative attitude, adjust to approx. 0° attitude and release the FT. Allow the aircraft to climb and apply approximately 15% Tq above hover power with the collective. Making full use of the FTR during the maneuver will reduce cyclic spring forces and will allow you to maintain the correct attitude throughout the maneuver. Adopt balanced flight as you pass through V2, trim and continue to accelerate to achieve Vy 80 KIAS and trim to maintain Vy, then adjust collective to achieve desired ROC (approx. 500ft/min).

c. The Climb. The climb is exactly the same as during the open field approach. Conduct the after-takeoff checks. Under normal conditions a climbing turn is made onto crosswind at 600ft QFE and the level off at 100 KIAS/1000ft QFE completed before turning downwind. You will climb at 80 KIAS / 70% Tq. In strong wind conditions you may consider to continue the climb straight ahead to 1000ft QFE before turning crosswind in order to penetrate far enough upwind to facilitate sufficient time on the downwind leg to complete the required checks.

d. Turn onto the Crosswind Leg. The turn onto the crosswind leg should be made using 20 - 30° AOB. Use the FTR on the cyclic to select the AOB and then when on the required heading roll out and release the FT. Allow for drift, laying off approximately 1° for every knot of wind. Confirm that the ground track is 90° to the runway and pick a suitable marker to track towards. Adjust heading with beep trim. Level off 100 KIAS/1000ft QFE using the technique:

A – Attitude Beep trim the speed stable attitude for 100 KIAS

P – Power Adjust the power required for straight and level flight. Using the collective FTR.

T – Trim Release all FTR and trim the aircraft including the pedals for S&L flight.

Turn onto the downwind leg using up to 30° AOB. Use the same technique as the crosswind turn.

e. The Downwind Leg. After rolling out of the turn, release the FT on the cyclic and use the beep trim to make fine adjustments for pitch and roll attitudes to maintain speed and wings level. Use the cyclic against spring pressure to turn in order to track parallel to the duty runway and check that spacing is suitable then select circuit markers for future use. Complete the “approach and final checks” as early as convenient.

When the landing point is approximately in the half past 4 / half past 7 o’clock position use the following techniques to turn on to the base leg. Trim the aircraft using the

T - Trim Depress the FTR on the collective.

P - Power Reduce power to approximately 30% Tq.

A - Attitude Initially maintain attitude until a positive ROD is established then gently select a declarative attitude with beep trim approx. 5 - 7° nose up.

T - Trim Engage the FTR on the cyclic and roll onto base leg using up to 30° AOB and roll out to track at 90° to the runway, allowing for wind as per the turn onto the crosswind leg. Adjust speed to 80 KIAS. Once speed stable on base leg release the FT. Fine tune as required with beep trim. Trim the pedals for balanced flight.

f. The Base Leg. Co-ordinate the turn onto finals using up to 30° AOB and adjust power as required to roll out at 500ft QFE aligned with previously chosen approach markers/runway. If the circuit has been flown accurately, you should roll out as you level off.

g. Finals. The aircraft should now be lined up with the landing point, at 500ft QFE. The airspeed should now be adjusted to 50 KIAS + wind speed. Balanced flight is maintained until the V2 (35 KIAS) (Note that the aircraft heading may not be the same as the runway heading if there is any crosswind component) then cross control maintaining heading with pedal and stopping any drift with cyclic as required in order to stay aligned with the runway center line and runway direction.

h. The Approach. Continue the same as the open field approach.

2. As the required ‘sight picture’ is intercepted, engage the FTR and lower the collective. Adopt a decelerative attitude with the beep trim, between 5-10° nose up and adjust to maintain a speed reduction but not less than 30 KIAS. Adjust the collective to maintain the touchdown point in the desired ‘sight picture’ looking out laterally to assess approach speed (using cyclic to adjust). The Flight Path Marker on the PFD will also enhance visualization of the approach paths likely touchdown point (see below). There should be no reason for your ROD to exceed 500ft/min. Engage the FTR on the cyclic at some stage during the approach and at 70ft AGL continue to decelerate through 30 KIAS. Anticipate the requirement for increased power as translational lift is lost, aligning the aircraft (longitudinally) with ground track as you decelerate through V2 (35 KIAS) facilitating a favorable condition to run-on during an emergency.

3. Bring the helicopter to a hover at 3ft AGL. Land as required.

CARRY OUT THE PRE-LANDING APPROACH AND FINAL CHECKLIST

1. The Pre-Landing checks are normally carried out at a time of low workload, normally downwind in the circuit or before joining an airfield.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.

   b. Monitor fuel and engine instruments.

   c. Monitor the wind velocity.

   d. Choose clear climb out and approach paths.

   e. Climb and approach parallel to the duty runway.

   f. Conform to ATC and R/T procedures in the circuit.

   g. Carry out all the relevant checks.

   h. “Heads in” “Heads out calls”

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Identify the beep trims on the cyclic and collective and keep your thumbs on them as they will be used a lot during the circuit. This will avoid the need to keep looking inside the cockpit to identify them. Focus can be on the PFD bugs to ensure correct selection of height, speeds and headings.

3. Remember to pick markers before and during the initial circuit to assist in accuracy for subsequent circuits.

4. Confirm with the RAD HT on the PFD to assist in height keeping during the hover. It is however better to visually judge the hover height.

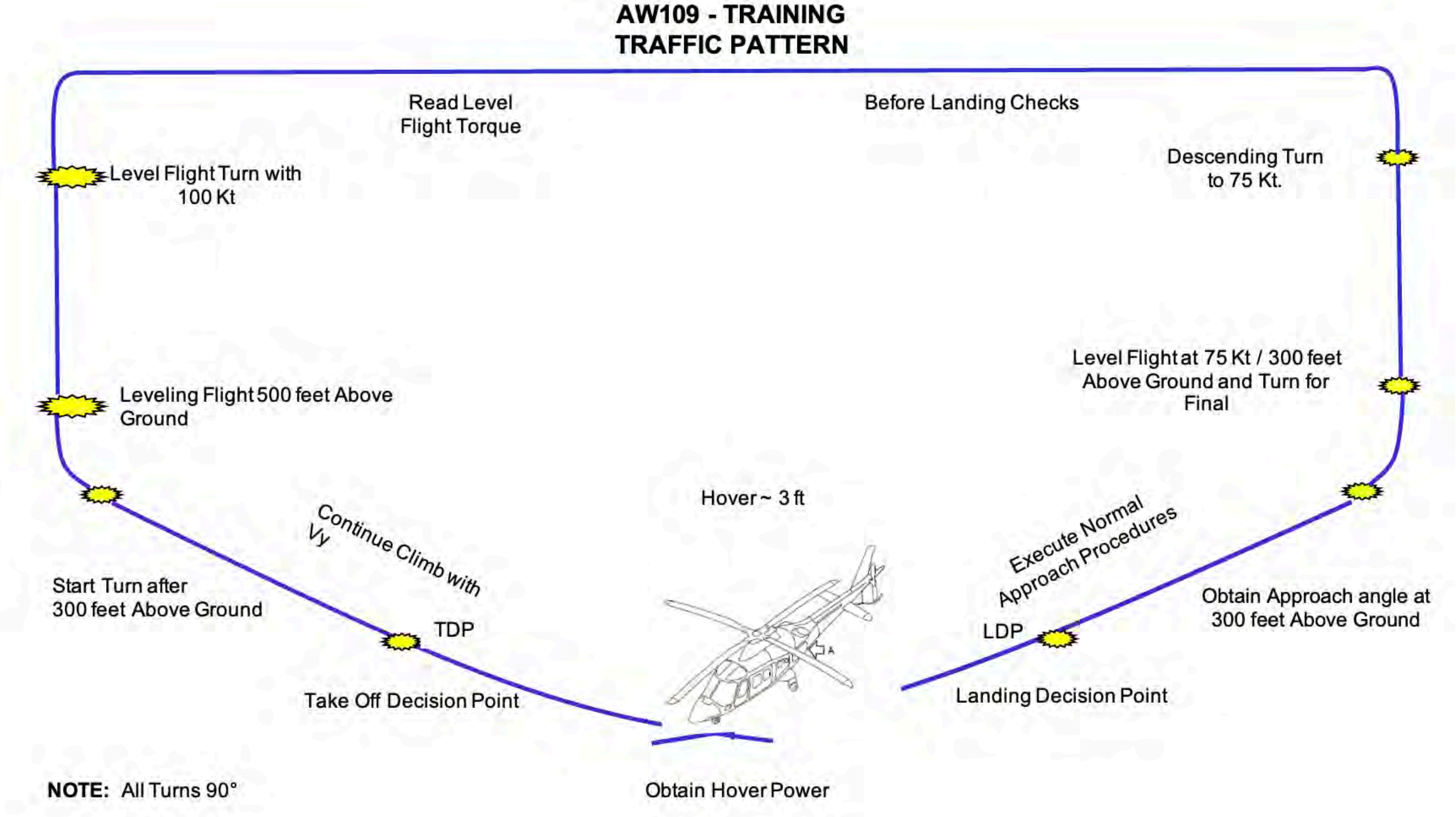
5. Before V2 maintain a forward ground track, minimize any lateral movement. After V2 and above 40 KIAS turn co-ordination will be automatically engaged and therefore balance maintained.

6. Maintain lookout and SA in the circuit especially with regards to other traffic.

7. Use the correct approach angle and maintain the centerline on finals.

COMMON ERRORS

- Not complying with the square traffic pattern,
- Not making the necessary wind corrections,
- Causing speed changes in turns,
- Being late in altitude and speed corrections,
- Not being able to coordinate the descending turn when returning to the main leg,
- Not being able to establish the starting standards when returning to final approach.



AW109 - TRAINING
TRAFFIC PATTERN
Read Level Flight Torque
Before Landing Checks
Level Flight Turn with 100 Kt
Descending Turn to 75 Kt.
Leveling Flight 500 feet Above Ground
Level Flight at 75 Kt / 300 feet Above Ground and Turn for Final
Hover ~ 3 ft
Continue Climb with Vy
Execute Normal Approach Procedures
Start Turn after 300 feet Above Ground
TDP
LDP
Obtain Approach angle at 300 feet Above Ground
Take Off Decision Point
Landing Decision Point
NOTE: All Turns 90°
Obtain Hover Power

NORMAL TAKEOFF FROM THE SURFACE (ROLLING TAKEOFF AND LANDING)

STANDARDS

- Before takeoff checks
- Cyclic acceleration: Passing 3 feet ADI -10°± 1°
- Power regulation: ± % 3
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

Normal takeoff from the surface is used to move the helicopter from a position on the surface into effective translational lift and a normal climb using a minimum amount of power. If the surface is dusty or covered with loose snow, this technique provides the most favorable visibility conditions and reduces the possibility of debris being ingested by the engine.

1. The Rolling Takeoff is a maneuver which has the advantage of getting airborne with reduced power. It also has the advantage of added safety because the aircraft is at an IAS conducive to SE prior to leaving the ground.

2. The Rolling Takeoff and Landing has many applications. Technique will vary according to environmental, and operational. At high DA/AUM, particularly in difficult terrain, power available will be critical to the technique.

3. The rolling landing is also a good technique for landing in the event of an engine failure/malfunction or loss of controllability (Servo/SAS/tail rotor malfunction, etc.).

TECHNIQUE

TRANSITION TO FORWARD FLIGHT USING ROLLING TAKEOFF

1. To carry out a running takeoff. Ensure that the Before Takeoff Checks have been carried out. Your instructor will give you a simulated power limitation.

2. With a clear area ahead, using the same method covered in preparation for ground taxiing, engage the FTR and raise the collective to indicate 30-35% Tq and trim the pedal position for a level attitude. Utilise a marker ahead of the aircraft and initiate acceleration by engaging the cyclic FTR and applying forward cyclic, ensuring that a ‘wings level’ attitude is maintained. Apply power gradually while maintaining the cyclic position. The aircraft will start moving forward and gradually accelerate; (correct for inflow roll by cross controlling and at translational lift or at 30 KIAS, whatever comes first, start pitching up to reduce load on nose wheel to a 5° pitch attitude and continue to accelerate and lift off. Maintain ground effect until reaching Vy, then rotate and climb. Trim as per the standard open field takeoff. Continue to be accelerate once airborne, do not be inclined to pull back.

3. Use the MFD hover mode ground speed readout and the speed vector to assist the speed at which to lift the aircraft off the ground.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.
b. Monitor fuel and engine instruments.
c. Awareness of the wind velocity.
d. Choose clear climb out and approach paths.
e. Performance calculation, interpolation and interpretation.
g. Carry out all the relevant checks.
h. Best ROC and best AOC speeds.

NOTES FOR THE STUDENT

1. During a limited power approach any decision to overshoot should be made early and the decision should be based on the following:

a. ROD is likely to exceed 500ft/min.
b. Final appraisal of landing area highlights surface imperfections (pot holes, obstructions etc).
c. Overshooting intended touchdown point (leaving insufficient stopping distance).

d. Run-on ground speed is likely to be excessive.

To carry out an overshoot from the approach:

a. Maintain the attitude (when operating very close to power limits and with enough height, you may increase power margin by adjusting to V2 (35 KIAS).

b. This technique may increase ROD temporarily.

c. Increase collective to max power available.

d. Accelerate to Vy once above 200ft AGL and a positive ROC is established.

2. The tail will not touch the ground if the aircraft pitch attitude is less than 10°, but safety consideration and training margins must be applied.

3. Maintain lookout and especially with regards to other traffic.

4. Use the correct approach angle and maintain the centerline on finals.

5. There is a general tendency during touchdown to maintain excess nose up attitude, leading to the tail getting close to the ground, this must be corrected but care should be taken to avoid the opposite error, touching down with the nose-wheel first

6. The nose-wheel is not as robust as the main landing gear, so a 5° nose up attitude during the touch-down is to be maintained, cross-check ADI indications on the PFD before and during landing.

7. You must not relax after touchdown until the aircraft has come to a full stop. Directional control may be lost endangering the last part of maneuver.

COMMON ERRORS

1. Departing the surface in an attitude that is too nose low. This situation requires the use of excessive power to initiate a climb.

2. Using excessive power combined with a level attitude, which causes a vertical climb, unless needed for obstructions and landing considerations.

3. Application of the collective that is too abrupt when departing the surface, causing rpm and heading control errors.

NORMAL APPROACH TO THE SURFACE (RUNNING LANDING)

STANDARDS

- Before landing checks
- Establishing Initials: 300 feet ± 50 feet
  Airspeed: 75 Kt. ± 10 Kt
- Establishing Decision Point: 70 feet ± 10 feet
  50 Kt. ± 5 Kt.
- Approach Angle: Normal approach angle
- Heading: ± 10 °
- Drift on the ground: 1 foot

DEFINITION

A normal approach to the surface or a no-hover landing is often used if loose snow or dusty surface conditions exist. These situations could cause severely restricted visibility, or the engine could possibly ingest debris when the helicopter comes to a hover. The approach is the same as the normal approach to a hover; however, instead of terminating at a hover, continue the approach to touchdown. Touchdown should occur with the skids level, zero groundspeed, and a rate of descent approaching zero.

1. The Rolling Takeoff is a maneuver which has the advantage of getting airborne with reduced power. It also has the advantage of added safety because the aircraft is at an IAS conducive to SE prior to leaving the ground.

2. The Rolling Takeoff and Landing has many applications. Technique will vary according to environmental, and operational. At high DA/AUM, particularly in difficult terrain, power available will be critical to the technique.

3. The rolling landing is also a good technique for landing in the event of an engine failure/malfunction or loss of controllability (Servo/SAS/tail rotor malfunction, etc.).

TECHNIQUE

CARRY OUT AN APPROACH TO A RUNNING LANDING

1. A running landing is only possible on smooth surfaces. The forward speed must be below 40kts ground speed and ground contact should be made at minimum vertical speed.
2. The approach and Final checks must be conducted as required by Normal Checklist.
3. Your instructor will give you a simulated maximum power available.
4. Start the approach from 500ft AGL but further away from the intended touchdown point. Trim the cyclic speed stable attitude aircraft at 60 KIAS. Perform a shallow approach with a ROD of 200 – 300ft/min passing through a gate at 200ft AGL at 60 KIAS. At this point engage the FTR on the cyclic and select a decelerative attitude, speed should be reduced to at or below 40kts ground speed, this can be confirmed on the MFD (see above) (10° pitch above horizon should be enough). Confirm power margin (power available) and select a speed suitable for the power in hand.
a. For example if the power margin is only 10% maintain 40kts ground speed. Trim the cyclic for a speed stable attitude.
b. If the power margin is in excess of 10% the speed can be reduced further to allow a slower run-on.
5. After touchdown engage the pedal FTR to control the heading and then collective lever can be lowered maintaining enough power to assist in yaw control, a rapid decrease in Tq will result in the aircraft yawing to the left.
6. Braking action should be then initiated by applying pressure on both pedal brakes simultaneously. Caution – avoid pressing the toe brakes all the way to the stops as this can induce wheel blockage and subsequent damage to the tires..
7. Once ground contact is made the collective can be lowered to help slow the aircraft but maintaining enough power to control the aircraft in yaw. Forward speed can then be reduced to a taxiing speed or the aircraft may be brought to stop.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:
   a. Lookout.
   b. Monitor fuel and engine instruments.
   c. Awareness of the wind velocity.
   d. Choose clear climb out and approach paths.
   e. Performance calculation, interpolation and interpretation.
   g. Carry out all the relevant checks.
   h. Best ROC and best AOC speeds.

NOTES FOR THE STUDENT

1. During a limited power approach any decision to overshoot should be made early and the decision should be based on the following:
   a. ROD is likely to exceed 500ft/min.
   b. Final appraisal of landing area highlights surface imperfections (pot holes, obstructions etc).
   c. Overshooting intended touchdown point (leaving insufficient stopping distance).
   d. Run-on ground speed is likely to be excessive.

To carry out an overshoot from the approach:
   a. Maintain the attitude (when operating very close to power limits and with enough height, you may increase power margin by adjusting to V2 (35 KIAS).
   b. This technique may increase ROD temporarily.
   c. Increase collective to max power available.
   d. Accelerate to Vy once above 200ft AGL and a positive ROC is established.

2. The tail will not touch the ground if the aircraft pitch attitude is less than 10°, but safety consideration and training margins must be applied.
3. Maintain lookout and especially with regards to other traffic.
4. Use the correct approach angle and maintain the centerline on finals.

5. There is a general tendency during touchdown to maintain excess nose up attitude, leading to the tail getting close to the ground, this must be corrected but care should be taken to avoid the opposite error, touching down with the nose-wheel first
6. The nose-wheel is not as robust as the main landing gear, so a 5° nose up attitude during the touch-down is to be maintained, cross-check ADI indications on the PFD before and during landing.
7. You must not relax after touchdown until the aircraft has come to a full stop. Directional control may be lost endangering the last part of maneuver.

COMMON ERRORS
1. Terminating to a hover, and then making a vertical landing.
2. Touching down with forward movement.
3. Approaching too slow, requiring the use of excessive power during the termination.
4. Approaching too fast, causing a hard landing
5. Not maintaining wheels aligned with direction of travel at touchdown. Any movement or misalignment of the gear can induce dynamic rollover.

SPEED CHANGES IN LEVEL FLIGHT

STANDARDS

- Correctly aircraft limitations.
- Altitude: ± 100 feet
- Airspeed: Slowing 65 Kt. ± 10 Kt. - Accelerating 100 Kt. ± 10 Kt.
- Track: ± 10°

DEFINITION

1. This serial will consolidate the flying controls co-ordination required in order to achieve a desired flight path and speed. The exercises covered are flown both with and without holds engaged, providing an ideal opportunity to consolidate on previously taught techniques.

2. The majority of the aircraft's displayed information is in the form of a digital readout and therefore the following points should be considered when interpreting digital indications:

a. Accuracy. Digital indications are accurate to as little as 1kt or 1ft and therefore unlike analogue instruments, are constantly changing. Although you should always strive to fly accurately, guard against chasing digital readouts by allowing the aircraft to stabilize before making any flight control corrections.

b. Interpretation. To maintain 100 KIAS/2500 ft using conventional analogue instruments can be achieved by establishing apparent clock indications on the relevant gauges. For example: indications of twelve o'clock on the ASI and two thirty on the Bar Alt and not actually having to remember the required figures. Digital readouts as seen on the PFD require continuous mental interpretation.

NOTE: Deceleration for training purposes 65 Kt. will be done up to speed.

CARRY OUT SPEED CHANGES MAINTAINING ALTITUDE AND HEADING WITHOUT FLIGHT DIRECTOR

1. Although initially it may help to equate Tq indications to various speeds (as done on previous aircraft types), be aware that these indications will vary significantly dependent upon environmental conditions and aircraft weight. The Vertical Speed Indicator on the PFD is a useful reference for adjusting the collective to obtain the correct power setting for level flight. However, this does not relax the importance of scanning Tq whenever adjusting the collective to prevent any likelihood of an over-torque.

2. The technique for speed adjustment is unchanged (i.e., attitude, power, trim). As always, ensure a good lookout prior to and during the maneuver. The following will be practiced:

a. Deceleration. To reduce speed, adopt a decelerative attitude by either using the cyclic beep trim, or engaging the FTR selecting the desired decelerative attitude and releasing the trim. At the same time, engage the collective FTR and lower the collective in order to prevent the aircraft from climbing. Confirm with the PFD VSI to maintain the altitude. Maintain the decelerative attitude and anticipate the forward cyclic beep trim input required to establish the new required speed. Or using the FTR technique re-select a speed stable attitude. Adjust the collective to maintain the altitude at the new speed and trim the aircraft. Check balance and aircraft heading and trim the pedals if required. (Turn co-ordination should maintain balance). Confirm that the Speed Trend Indicator on the speed tape on the PFD indicates speed stable. Note the pitch attitude for that speed setting.

b. Acceleration. To increase speed, adopt an accelerative attitude by either using the cyclic beep trim, or engaging the FTR. Engage the collective FTR and raise the in order to prevent the aircraft from descending. Check Tq. Maintain the accelerative attitude and anticipate the aft cyclic beep trim input required to establish the new required speed and trim the aircraft. Check balance and aircraft heading and trim the pedals if required. (Turn co-ordination should maintain balance). Confirm the Speed Trend Indicator next to the speed tape indicates speed stable. Note the pitch attitude for that speed setting.

CARRY OUT SPEED CHANGES WITH THE USE OF FLIGHT DIRECTOR WHILST MAINTAINING ALTITUDE AND HEADING MANUALLY

1. The Upper Modes are engaged with the APMS panel. For speed changes IAS is used.

2. Engage the IAS on the APMS, the PFD will display IAS at the bottom, the magenta bug will appear on the airspeed tape and the digital read out will appear above the speed tape. The IAS can now be adjusted in two ways.

a. With the beep trim, forward and aft on the cyclic. The magenta bug will move and the digital readout will display the selected airspeed.

b. The IAS rotating knob on the APMS can be turned to select a new airspeed. The indications displayed are the same as using the beep trim.

3. When changing the IAS with the cyclic beep trim, the FTR on the collective must be engaged, and as previously described, power adjusted to maintain the altitude. Check Tq. Release the collective FT for the new airspeed.

4. Remember that turn co-ordination is active automatically so the aircraft balance should be maintained.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout. CRM “Heads in” “Heads out calls”.

b. Monitor engine instruments.

c. Monitoring Tq and limitations

d. Monitor the automation.

NOTES FOR THE STUDENT

1. Identify the beep trim on the cyclic and keep your thumb on it. This will avoid the need to keep looking inside the cockpit to identify it. Focus can then be on the PFD bug to ensure correct speed selection.

2. As always, when using automation, the flight path of the aircraft must be monitored.

3. Maintain lookout and SA (Situational Awareness) especially with regards to other traffic.

COMMON ERRORS

- Failure to control environment.
- To start the action without establishing the initial principles.
- Using the controls uncoordinated and very serially.
- Not being able to maintain altitude.
- Falling below the deceleration speed.
- Not being able to keep track of direction and ground.

RAPID DECELERATION OR QUICK STOP

STANDARDS

- Airspeed: (Vy) 80 Kt. ± 10 Kt.
- Deceleration Attitude: +20°- +25° ± 3°

- Track: ± 10°
- Height ± 20ft. (Quick Stop)
- Heading ± 10°
- Height ± 50ft (Rapid Deceleration)

DEFINITION

1. Rapid deceleration straight ahead is a useful exercise to develop co-ordination and accuracy during training.

2. Quick stops are essentially an advanced co-ordination exercise, although they do have some operational applications whenever a rapid transition from forward flight to the hover is required. Conducting a Quickstop is also a way of aborting a departure if required. As these are low level maneuvers, you must put more emphasis on the use of external references when judging attitude, angle of bank, height and heading. However, the lookout, attitude, instrument scan is still appropriate. It is important to choose a fairly level, obstruction free area for Quick stops, and they are therefore normally carried out on an airfield.

TECHNIQUE

CARRY OUT A QUICK STOP

1. Flare Effects. When the aircraft attitude is changed to produce a reduction in speed (i.e., flared), the aircraft will experience additional effects. These flare effects will increase in magnitude as the overall attitude change, rate of attitude change or entry speed increases. As the whole point of the quick stop is to rapidly reduce groundspeed to zero and establish the hover or reject, it is important to judge the flare by reference to groundspeed.

   a. Height. The aircraft will climb as soon as the flare is applied.

   b. Heading. With a reduction in airspeed, the aircraft will yaw to the right.

   c. Torque. The flare produces a tendency for the NR to increase. This leads to a reduction in Tq. If the height is maintained by lowering the collective lever, and the heading is maintained by applying right pedal, the overall reduction in Tq can be quite marked. With a rapid flare from high entry speeds the collective lever will need to be lowered fully to maintain height, and Tq will reduce to zero. The maneuver should never be too harsh which would result in a very low Tq i.e. resulting in an NR autorotation configuration. If this should happen either raise the collective or reduce the severity of the flare.

2. Set up into wind at 80 KIAS, or at 80 KIAS during the take off. At an appropriate point (minimum of 50ft AGL) verbalize “quick stop quick stop go” Engage the FTR on all three controls and begin the flare with the cyclic. Adjust the collective to maintain height (using the backdrop technique and confirm visually that the aircraft is not climbing or descending).

Use up to 20° nose up. (With over 20° nose-up attitude you may well lose sight of your forward visual references). The “Flare Effects” as previously mentioned will take effect and the aircraft will begin to decelerate. As the airspeed reduces below 30 KIAS anticipate the loss of translational lift and apply more power to stop the aircraft from descending. Maintain the heading with pedals by using a marker in the 12 O’clock of the aircraft and anticipate the amount of pedal input required to maintain heading as power is increased. Once in or close to the hover descend forward and down to IGE or landing.

CARRY OUT A RAPID DECELERATION

1. The Rapid Deceleration (and acceleration) will be performed at an altitude of 1000ft AGL minimum, at 80 KIAS straight and level in an area clear of traffic, into wind.

2. At 80 KIAS straight and level engage the FTR on all three controls and smoothly apply 20° nose up, simultaneously lower the collective to maintain height. This is more difficult to visually judge at altitude so you will need to confirm and make reference to the VSI during the maneuver.

3. As the speed reduces below 40 KIAS adopt a pitch down nose attitude of 15°. At the same time apply power as required in order to achieve 80 KIAS without losing altitude.

4. Once airspeed is established at 80 KIAS exercise may start again. It is important during the practice of rapid deceleration/acceleration that you maintain constant altitude and constant heading.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose a sufficient large, level and clear area.

e. Carry out all the relevant airmanship and landing checks.

NOTES FOR THE STUDENT

1. Do not focus totally on the VSI during these maneuvers maintain a lookout and just confirm the ROC/ROD on the VSI.

2. Remember to pick a marker at the 12 O'clock of the aircraft before commencing the exercises.

3. Maintain lookout and SA especially with regards to other traffic.

4. Quick stop Errors. There are three major errors that could occur when practicing Quick stops:

a. Flare too Low. Clearly, at very low level it would be possible to strike the tail during the flare. For this reason, Quick stops are practiced at a minimum of 50ft AGL.

b. Descending in the Flare. Even if the flare is started at the correct height, if you allow the aircraft to descend in the flare the tail could strike the ground. In addition, if the airspeed is low and power is being applied, the conditions for vortex ring exist.

c. Maintaining the Flare with Zero Groundspeed. Should the flare be maintained with zero groundspeed and with power being applied, the aircraft would start to accelerate backwards. This could lead to a negative airspeed and possible over-controlling

COMMON ERRORS

1. Initiating the maneuver by lowering the collective without aft cyclic pressure to maintain altitude.
2. Initially applying aft cyclic stick too rapidly, causing the helicopter to balloon (climb).
3. Failing to effectively control the rate of deceleration to accomplish the desired results.
4. Allowing the helicopter to stop forward motion in a tail-low attitude.
5. Failing to maintain proper rotor rpm.
6. Waiting too long to apply collective pitch (power) during the recovery, resulting in excessive manifold pressure or an over torque situation when collective pitch is applied rapidly.
7. Failing to maintain a safe clearance over the terrain.
8. Using antitorque pedals improperly, resulting in erratic heading changes.
9. Using an excessively nose-high attitude.

RECONNAISSANCE PROCEDURES

STANDARDS

- Airspeed: (Vy) 80 Kt. ± 10 Knot.
- Altitude: ± 100 feet
- Observation angle: 30° - 45°

DEFINITION

When planning to land or take off at an unfamiliar site, gather as much information as possible about the area.

Reconnaissance techniques are ways of gathering this information.

High Reconnaissance

The purpose of conducting a high reconnaissance is to determine direction and speed of the wind, a touchdown point, suitability of the landing area, approach and departure axes, and obstacles for both the approach and departure. The pilot should also give particular consideration to forced landing areas in case of an emergency.

Altitude, airspeed, and flight pattern for a high reconnaissance are governed by wind and terrain features. It is important to strike a balance between a reconnaissance conducted too high and one too low. It should not be flown so low that a pilot must divide attention between studying the area and avoiding obstructions to flight. A high reconnaissance should be flown at an altitude of 300 to 500 feet above the surface. A general rule to follow is to ensure that sufficient altitude is available at all times to land into the wind in case of engine failure. In addition, a 45° angle of observation generally allows the best estimate of the height of barriers, the presence of obstacles, the size of the area, and the slope of the terrain. Always maintain safe altitudes and airspeeds and keep a forced landing area within reach whenever possible.

Low Reconnaissance

A low reconnaissance is accomplished during the approach to the landing area. When flying the approach, verify what was observed in the high reconnaissance, and check for anything new that may have been missed at a higher altitude, such as wires and their supporting structures (poles, towers, etc.), slopes, and small crevices. If the pilot determines that the area chosen is safe to land in, the approach can be continued. However, the decision to land or go around must be made prior to decelerating below effective translational lift (ETL), or before descending below the barriers surrounding the confined area.

If a decision is made to complete the approach, terminate the landing to a hover in order to check the landing point carefully before lowering the helicopter to the surface. Under certain conditions, it may be desirable to continue the approach to the surface. Once the helicopter is on the ground, maintain operating rpm until the stability of the helicopter has been checked to be sure it is in a secure and safe position.

Ground Reconnaissance

Prior to departing an unfamiliar location, make a detailed analysis of the area. There are several factors to consider during this evaluation. Besides determining the best departure path and identifying all hazards in the area, select a route that gets the helicopter from its present position to the takeoff point while avoiding all hazards, especially to the tail rotor and landing gear.

Some things to consider while formulating a takeoff plan are the aircraft load, height of obstacles, the shape of the area, direction of the wind, and surface conditions. Surface conditions can consist of dust, sand and snow, as well as mud and rocks. Dust landings and snow landings can lead to a brownout or whiteout condition, which is the loss of the horizon reference. Disorientation may occur, leading to ground contact, often with fatal results. Taking off or landing on uneven terrain, mud, or rocks can cause the tail rotor to strike the surface or if the skids get caught can lead to dynamic rollover. If the helicopter is heavily loaded, determine if there is sufficient power to clear the obstacles. Sometimes it is better to pick a path over shorter obstacles than to take off directly into the wind. Also evaluate the shape of the area so that a path can be chosen that will provide you the most room to maneuver and abort the takeoff if necessary. Positioning the helicopter to the most downwind portion of the confined area gives the pilot the most distance to clear obstacles. Wind analysis also helps determine the route of takeoff. The prevailing wind can be altered by obstructions on the departure path and can significantly affect aircraft performance. There are several ways to check the wind direction before taking off. One technique is to watch the tops of the trees; another is to look for any smoke in the area. If there is a body of water in the area, look to see which way the water is rippling. If wind direction is still in question revert back to the last report that was received by either ATIS or airport tower.

COMMON ERRORS

- Making major changes in flight altitude and speed,
- Approaching too close or far from the region without controlling the turns according to the wind,
- Not paying attention to other traffic,
- Not choosing suitable forced landing sites,
- Not choosing a suitable landing site,
- Not choosing the correct landing and take-off direction.

CONFINED AREA OPERATIONS

STANDARDS

- **Before Approach**
  - Altitude: ± 100 ft.
  - Airspeed: ± 10 Kt.
  - Reconnaissance of landing Site.
- **On Approach**
  - Maintaining the ground track.
  - Establishment and maintenance of a fixed approach angle.
  - Maintaining the proper rate of descent.
  - Low reconnaissance.
  - Making a soft and controlled landing in the first 1/3 of the landing area.

- **Before Take Off**
  - Proper completion of the ground reconnaissance and selection of an appropriate departure destination.
  - Carrying out a hover power check and completing pre-take-off checks if necessary.
  - Taxiing to the departure point.
- **Before Reaching Obstacles**
  - Heading: ±10°.
  - Maintaining the ground track.
  - Using the necessary power to pass the obstacles without exceeding the limits.
- **After Obstacles**
  - Climbing speed: ±10 Kt.
  - Rate of Climb: ± 100 fpm.
  - Keeping the aircraft on trim.
  - Maintaining the ground track.

DEFINITION

A confined area is an area where the flight of the helicopter is limited in some direction by terrain or the presence of obstructions, natural or manmade. For example, a clearing in the woods, a city street, a road, a building roof, etc., can each be regarded as a confined area. The helicopter pilot has added responsibilities when conducting operations from a confined area that airplanes pilots do not. He or she assumes the additional roles of the surveyor, engineer, and manager when selecting an area to conduct operations. While airplane pilots generally operate from known pre-surveyed and improved landing areas, helicopter pilots fly into areas never used before for helicopter operations. Generally, takeoffs and landings should be made into the wind to obtain maximum airspeed with minimum groundspeed. The pilot should begin with as nearly accurate an altimeter setting as possible to determine the altitude.

There are several things to consider when operating in confined areas. One of the most important is maintaining a clearance between the rotors and obstacles forming the confined area. The tail rotor deserves special consideration because, in some helicopters, it is not always visible from the cabin. This not only applies while making the approach, but also while hovering. Another consideration is that wires are especially difficult to see; however, their supporting devices, such as poles or towers, serve as an indication of their presence and approximate height. If any wind is present, expect some turbulence.

Something else to consider is the availability of forced landing areas during the planned approach. Think about the possibility of flying from one alternate landing area to another throughout the approach, while avoiding unfavorable areas. Always leave a way out in case the landing cannot be completed, or a go-around is necessary.

During the high reconnaissance, the pilot needs to formulate a takeoff plan as well. The heights of obstacles need to be determined. It is not good practice to land in an area and then determine that insufficient power exists to depart. Generally, more power is required to take off than to land so the takeoff criteria is most crucial. Fixing the departure azimuth or heading on the compass is a good technique to use. This ensures that the pilot is able to take off over the preselected departure path when it is not visible while sitting

in the confined area.

Approach

A high reconnaissance should be completed before initiating the confined area approach. Start the approach phase using the wind and speed to the best possible advantage. Keep in mind areas suitable for forced landing. It may be necessary to choose a crosswind approach that is over an open area, then one directly into the wind that is over trees. If these conditions exist, consider the possibility of making the initial phase of the approach crosswind over the open area and then turning into the wind for the final portion of the approach.

Always operate the helicopter as close to its normal capabilities as possible, taking into consideration the situation at hand. In all confined area operations, with the exception of the pinnacle operation, the angle of descent should be no steeper than necessary to clear any barrier with the tail rotor in the approach path and still land on the selected spot. The angle of climb on takeoff should be normal, or not steeper than necessary to clear any barrier. Clearing a barrier by a few feet and maintaining normal operating rpm, with perhaps a reserve of power, is better than clearing a barrier by a wide margin but with a dangerously low rpm and no power reserve.

The descent is initiated when the approach angle is established, which crosses the landing point and the obstacle +100 feet. Considering a possible engine failure during the approach, the speed Vtoss (40 Kt for training) cannot be dropped without overcoming obstacles. If a go-around is to be decided, it must be before falling under the obstacles and losing the Vtoss speed. While passing obstacles, the current forward speed and sink rate are reduced, and the movement is terminated so that the ground speed above the landing point is zero.

Always make the landing to a specific point and not to some general area. This point should be located well forward, away from the approach end of the area. The more confined the area is, the more essential it is that the helicopter land precisely at a definite point. Keep this point in sight during the entire final approach. When flying a helicopter near obstacles, always consider the tail rotor. A safe angle of descent over barriers must be established to ensure tail rotor clearance of all obstructions. After coming to a hover, avoid turning the tail into obstructions.

Takeoff

A confined area takeoff is considered an altitude over airspeed maneuver where altitude gain is more important to airspeed gain. Before takeoff, make a reconnaissance from the ground or cockpit to determine the type of takeoff to be performed, to determine the point from which the takeoff should be initiated to ensure the maximum amount of available area, and finally, how to maneuver the helicopter best from the landing point to the proposed takeoff position.

If wind conditions and available area permit, the helicopter should be brought to a hover, turned around, and hovered forward from the landing position to the takeoff position. Under certain conditions, sideward flight to the takeoff position may be preferred, but rearward flight may be necessary, stopping often while moving to check on the location of obstacles relative to the tail rotor.

For take-off, the collective is applied continuously and smoothly, while the cyclic is given as far forward as necessary for passage over obstacles (from obstacle + 100 feet safe altitude). In the meantime, the engine and transmission clocks and RPM clocks are cross-checked, and the limits are followed. While passing the TDP, the cyclicity is advanced to reach the speed Vy and power is arranged to establish the desired climb rate.

When planning the takeoff, consider the direction of the wind, obstructions, and forced landing areas. To help fly up and over an obstacle, form an imaginary line from a point on the leading edge of the helicopter to the highest obstacle to be cleared. Fly this line of ascent with enough power to clear the obstacle by a safe distance. After clearing the obstacle, maintain the power setting and accelerate to the normal climb speed. Then, reduce power to the normal climb power setting.

COMMON ERRORS

1. Failure to perform, or improper performance of, a high or low reconnaissance.
2. Approach angle that is too steep or too shallow for the existing conditions.
3. Failing to maintain proper rpm.
4. Failure to consider emergency landing areas.
5. Failure to select a specific landing spot.
6. Failure to consider how wind and turbulence could affect the approach.
7. Improper takeoff and climb technique for existing conditions.
8. Failure to maintain safe clearance distance from obstructions.

PINNACLE AND RIDGELINE OPERATIONS

STANDARDS

1) **Reconnaissance**
   - Maintain altitude ± 100 ft
   - Entry Airspeed ± 10 Kt

- Making a suitable reconnaissance
- Airspeed Vy 80Kt

2) Approach

- Maintaining the selected approach line and ground track.
- Establishing a fixed approach angle.
- Monitoring ground speed and descent rate.

3) Take Off

- Carrying out hover power checks, ground reconnaissance and before take off checks if necessary.
- Taxi to the departure point.
- Establishing take-off power without delay while maintaining heading within ±10°.
- Maintaining 65Kt ±10Kt.

DEFINITION

A pinnacle is an area from which the surface drops away steeply on all sides. A ridgeline is a long area from which the surface drops away steeply on one or two sides, such as a bluff or precipice. The absence of obstacles does not necessarily decrease the difficulty of pinnacle or ridgeline operations. Updrafts, downdrafts, and turbulence, together with unsuitable terrain in which to make a forced landing, may still present extreme hazards.

Approach and Landing

If there is a need to climb to a pinnacle or ridgeline, do it on the upwind side, when practicable, to take advantage of any updrafts. The approach flightpath should be parallel to the ridgeline and into the wind as much as possible.

When flying an approach to a pinnacle or ridgeline, avoid the areas where downdrafts are present, especially when excess power is limited. If downdrafts are encountered, it may become necessary to make an immediate turn away from the pinnacle to avoid being forced into the rising terrain.

Load, altitude, wind conditions, and terrain features determine the angle to use in the final part of an approach. As a general rule, the greater the winds are, the steeper the approach needs to be to avoid turbulent air and downdrafts.

Groundspeed during the approach is more difficult to judge because visual references are farther away than during approaches over trees or flat terrain. Pilots must continually perceive the apparent rate of closure by observing the apparent change in size of the landing zone features. Avoid the appearance of an increasing rate of closure to the landing site. The apparent rate of closure should be that of a brisk walk. If a crosswind exists, remain clear of down-drafts on the leeward or downwind side of the ridgeline. If the wind velocity makes the crosswind landing hazardous, it may be possible to make a low, coordinated turn into the wind just prior to terminating the approach. When making an approach to a pinnacle, avoid leeward turbulence and keep the helicopter within reach of a forced landing area as long as possible.

On landing, take advantage of the long axis of the area when wind conditions permit. Touchdown should be made in the forward portion of the area. When approaching to land on pinnacles, especially manmade areas such as rooftop pads, the pilot should determine the personnel access pathway to the helipad and ensure that the tail rotor is not allowed to intrude into that walkway or zone. Parking or landing with the tail rotor off the platform ensures personnel safety. Always perform a stability check prior to reducing rpm to ensure the landing gear is on firm terrain that can safely support the weight of the helicopter. Accomplish this by slowly moving the cyclic and pedals while lowering the collective. If movement is detected, reposition the aircraft.

Takeoff

A pinnacle takeoff is considered an airspeed over altitude maneuver which can be made from the ground or from a hover. Since pinnacles and ridgelines are generally higher than the immediate surrounding terrain, gaining airspeed on the takeoff is more important than gaining altitude. As airspeed increases, the departure from the pinnacle is more rapid and helicopter time in the “avoid” area of the height/velocity decreases. In addition to covering unfavorable terrain rapidly, a higher airspeed affords a more favorable glide angle and thus contributes to the chances of reaching a safe area in the event of a forced landing. If a suitable forced landing area is not available, a higher airspeed also permits a more effective flare prior to making an autorotative landing.

On takeoff, as the helicopter moves out of ground effect, maintain altitude and accelerate to normal climb airspeed. When normal climb speed is attained, establish a normal climb attitude. Never dive the helicopter down the slope after clearing the pinnacle.

NOTE: By evaluating performance, altitude, obstacle situation and environmental conditions, the take-off technique can be changed in the form of acceleration at constant altitude or to provide the safe take-off profile that the pilot deems appropriate.

When the speed Vy is reached, the cycle is applied backwards, and normal climbing principles are established.

COMMON ERRORS

1. Failing to perform, or improper performance of, a high or low reconnaissance.
2. Flying the approach angle too steep or too shallow for the existing conditions.
3. Failing to maintain proper rpm.
4. Failing to consider emergency landing areas.
5. Failing to consider how wind and turbulence could affect the approach and takeoff.
6. Failure to maintain pinnacle elevation after takeoff.
7. Failure to maintain proper approach rate of closure.
8. Failure to achieve climb airspeed in timely manner.

NOTE: *By evaluating performance, altitude, obstacle situation and environmental conditions, the take-off technique can be changed in the form of acceleration at constant altitude or to provide the safe take-off profile that the pilot deems appropriate.*

When the speed Vy is reached, the cycle is applied backwards, and normal climbing principles are established.

SLOPE OPERATIONS

STANDARDS

- Keeping the head direction perpendicular to the slope ± 5°
- The drift before touching the ground should not exceed 1 feet, there should be no drift after touching the ground,
- Soft, smooth and controlled descent and ground contact,
- Smooth and controlled vertical ascent.

DEFINITION

AW109; <u>RFM SECTION 1 LIMITATIONS Slope Landing/Take Off Limits:</u>

- Nose Up from Left 90°, to Nose Up Right 90°: 10°, Slope Down: 2°

Prior to conducting any slope operations, be thoroughly familiar with the characteristics of dynamic rollover and mast bumping. The approach to a slope is similar to the approach to any other landing area. During slope operations, make allowances for wind, barriers, and forced landing sites in case of engine failure. Since the slope may constitute an obstruction to wind passage, anticipate turbulence and downdrafts.

Slope Landing

A pilot usually lands a helicopter across the slope rather than with the slope. Landing with the helicopter facing down the slope or downhill is not recommended because of the possibility of striking the tail rotor on the surface.

TECHNIQUE

At the termination of the approach, if necessary, move the helicopter slowly toward the slope, being careful not to turn the tail upslope. Position the helicopter across the slope at a stabilized hover headed into the wind over the intended landing spot. Downward pressure on the collective starts the helicopter descending. As the upslope skid touches the ground, hesitate momentarily in a level attitude, then apply slight lateral cyclic in the direction of the slope. This holds the skid against the slope while the pilot continues lowering the downslope skid with the collective. As the collective is lowered, continue to move the cyclic toward the slope to maintain a fixed position. The slope must be shallow enough to hold the helicopter against it with the cyclic during the entire landing. A slope of 5° is considered maximum for normal operation of most helicopters. Consult the RFM or POH for the specific limitations of the helicopter being flown.

Be aware of any abnormal vibration or mast bumping that signals maximum cyclic deflection. If this occurs, abandon the landing because the slope is too steep. In most helicopters with a counterclockwise rotor system, landings can be made on steeper slopes when holding the cyclic to the right. When landing on slopes using left cyclic, some cyclic input must be used to overcome the translating tendency. If wind is not a factor, consider the drifting tendency when determining landing direction.

After the downslope skid is on the surface, reduce the collective to full down, and neutralize the cyclic and pedals. Normal operating rpm should be maintained until the full weight of the helicopter is on the landing gear. This ensures adequate rpm for immediate takeoff in case the helicopter starts sliding down the slope. Use antitorque pedals as necessary throughout the landing for heading control. Before reducing the rpm, move the cyclic control as necessary to check that the helicopter is firmly on the ground.

Landing: Autopilot and SAS are deactivated before starting the slope work. The slope landing area is approached at an angle between 45° and 90°. A stable stance is ensured with the wheels perpendicular to the slope. The tail of the helicopter is not moved up the slope. Good pedal control is essential for the safety of the descent. Stand on a fixed floor 3 feet above the landing place. Most of the attention is given to the front and outside of the helicopter. The collective is started to decrease, allowing the helicopter to slowly collapse, and the helicopter's horizon is maintained. While the wheel on the upper side of the slope touches the ground, the necessary controls are given to prevent the helicopter from tipping down the slope, and the horizon is provided on the horizontal axis by looking over the maroon panel. In the meantime, maximum attention is paid to the pedal trim. Without giving a deep command and using the beep trim on the cyclic, the collective is pressed down to maintain the horizon while simultaneously opening the cyclic uphill with reference from the top of the claret red panel. It should not be forgotten that if the cyclic slope approaches the limits during the descent phase, the slope of the slope is high and there may be a limit exceedance. Depending on the slope of the slope, the cyclic slope is opened up enough and after the appropriate mast slope is provided, the collective is held down for a soft contact of the downhill sled to the ground and the descent is completed in this way.

If the correct cyclic trim is done, there will be no need for additional beep trim when the downhill wheel is touching the ground. However, if the cyclic trim is not sufficient, enough cyclicity can be opened up the slope to prevent tipping down the slope while sitting on the ground. After making sure that the wheels are fully seated on the floor, the collective is pressed down softly. Cycles and pedals are centered.

CAUTION

Following a slope landing, the parking brake holding capability is guarantee for 2 minutes from rotor stop.

Be aware of dynamic rollover on slopes.

COMMON ERRORS

1. Failing to consider wind effects during the approach and landing.
2. Failing to maintain proper rpm throughout the entire maneuver.
3. Failure to maintain heading resulting in a turning or pivoting motion.
4. Turning the tail of the helicopter into the slope.
5. Lowering the downslope skid or wheel too rapidly.
6. Applying excessive cyclic control into the slope, causing mast bumping.

Slope Takeoff

A slope takeoff is basically the reverse of a slope landing. Conditions that may be associated with the slope, such as turbulence and obstacles, must be considered during the takeoff. Planning should include suitable forced landing areas.

TECHNIQUE

Begin the takeoff by increasing rpm to the normal range with the collective full down. Then, move the cyclic toward the slope. Holding the cyclic toward the direction of the slope causes the downslope skid to rise as the pilot slowly raises the collective. As the skid comes up, move the cyclic as necessary to maintain a level attitude in relation to the horizon. If properly coordinated, the helicopter should attain a level attitude as the cyclic reaches the neutral position. At the same time, use antitorque pedal pressure to maintain heading and throttle to maintain rpm. With the helicopter level and the cyclic centered, pause momentarily to verify everything is correct, and then gradually raise the collective to complete the liftoff. After reaching a hover, avoid hitting the ground with the tail rotor by not turning the helicopter tail upslope and gaining enough altitude to ensure the tail rotor is clear. If an upslope wind exists, execute a crosswind takeoff and then make a turn into the wind after clearing the ground with the tail rotor.

Take-off: The take-off from the slope to the nook is almost the same way of landing on the slope, but in the opposite direction. First, it is applied upwards until the collective attenuation state, while the cyclicity opens up sufficiently. When the attenuation condition is achieved, the current drifts and deviations in the head direction are eliminated, and at this point, the downhill skit is cut off the ground with a small upward collective application. The claret panel is applied collectively upwards until its upper part is parallel to the ground, and the direction is maintained with the pedals. Once the horizon has been achieved, the slope is cyclical down and the collective is kept full up enough to maintain the horizon. When the pall plane is in the horizontal position, the collective is applied upwards and the wheel is cut off from the ground, the movement is completed with a vertical movement. When leaving the slope, the tail should never be turned up the slope, the slope area should be left parallel to the slope.

COMMON ERRORS

1. Failing to adjust cyclic control to keep the helicopter from sliding down slope.

2. Failing to maintain proper rpm.

3. Holding excessive cyclic into the slope as the down slope skid is raised.

4. Failure to maintain heading, resulting in a turning or pivoting motion.

5. Turning the tail of the helicopter into the slope during takeoff.

DEMONSTRATION OF Vh AND Vne SPEED

STANDARDS

- Keeping selected Altitude constant (Only for Vh)
- Heading: ± 10º
- Establishing maximum continuous power (69% Torque)

DEFINITION

Vh Speed (Maximum horizontal speed)

This speed refers to the maximum speed that the helicopter can fly at constant altitude using the maximum continuous torque value. Before starting this movement, if the helicopter has an autopilot, a fixed altitude, and a fixed heading (heading) are set to be kept by the autopilot. The collective is applied slowly up to the maximum sustained torque, while cyclic forward enough to keep the altitude constant. This coordinated motion continues until maximum torque is applied. When this torque value is reached, the speed is adjusted so that the altitude remains constant, and the conditions are stabilized by flying in this position for a short time. The Vh value is determined by saying the value read out loud on the airspeed indicator.

Vne Speed

This speed refers to the speed that should never be exceeded. The Vne value is determined by looking at the helicopter's Flight Manual or the Speed Limit Cards on the top of the helicopter's instrument panel.

1. This exercise demonstrates the maneuverability of the aircraft at high speed and has useful but rather limited operational applications. Incursions into the upper limits of the flight envelope, when entered smoothly, provide a ‘feel’ for the aircraft which, helps to instill confidence in its capabilities. The aerodynamic stresses which the airframe and rotor system are exposed to during flight at or near VNE are significantly high.

2. Out of the training environment emphasis should be placed on early recognition when nearing VNE and avoidance of exceeding rather than practicing flight at VNE, nevertheless it is useful for you to experience flight at VNE and practice the correct recovery techniques.

CARRY OUT FLIGHT AT HIGH SPEED, Vne

1. VNE may be encountered in situations such as fast descent, unusual attitudes, etc. VNE varies with Gross Weight, PA, and OAT and the graphs associated with calculating the VNE before flight are located in the RFM. (168 KIAS up to 6000ft DA)

2. From level flight at 2000ft AGL or more increase and set Tq at 90% (ensure that the TOT and NG remain within limits) and allow the speed to increase up to VMax, (Maximum speed straight and level). Once stabilized, adopt a 5° nose down attitude using the cyclic beep trim. The aircraft will gradually reach VNE. Take care not to exceed Tq or VNE limitations, turn co-ordination will maintain balance during the dive.

3. Recover when approaching VNE by smoothly trimming the cyclic beep trim to select approximately 0° pitch and simultaneously engaging the FTR on the collective and reduce power gently to cruise power.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout below the aircraft.

   b. Monitor fuel and engine instruments limitations.

   c. Monitor the wind velocity.

   d. Choose a clear descent path.

   e. Carry out all the relevant checks airmanship.

NOTES FOR THE STUDENT

1. Conduct a lookout below the aircraft to ensure that the descent path is clear.

2. Try not to monitor the instruments too closely to the detriment of lookout.

3. Applying the cyclic positively enough to reach the required limit.

4. Remember to use an external heading marker to avoid the need to concentrate on the direction of the aircraft.

STEEP TURNS

STANDARDS

- Altitude: ± 200 feet
- Roll Out Heading: ± 10º
- Airspeed: 100Kt ±10 Kt
- Bank Angle: 60º ±5º
- Ground Level+1000 feet or more.

DEFINITION

Before starting the maneuver, you should be at least 1000 feet above the ground and the ground track should be determined by choosing landmarks in the direction. The turns are made in the form of 360º rotations from the right or left. It should not be forgotten that the helicopter will tend to give more altitude when turning from the left compared to the turning from the right.
1. The principle for turns is as you have utilized before (i.e. bank/balance/power). It is important that attitude is maintained from the initial application of 'bank' and that no attempt is made to chase minor speed changes. As the turn is established, altitude is controlled with collective. If the aircraft attitude changes due to collective input, re-gain the required attitude with the cyclic.
2. There are 3 methods of turning the aircraft onto specified heading. They all have their advantages and adapting which method is best for the situation will be clear once they have been practiced. The methods are:
   a. Against force spring pressure.
   b. Using the beep trim on the cyclic.
   c. Engaging the FTR and releasing at the desired AOB.

TECHNIQUE

TURN ONTO NEW HEADING USING A STEEP TURN WHILST IN LEVEL FLIGHT

1. Steep angle of bank will be over 30°. For training Steep Turns will be performed at 45° angle of bank.
2. Turning against spring pressure. This is more difficult to sustain and conduct accurately. Use the visual horizon to judge the AOB but beware, it is easy to roll more AOB than the desired. As you roll through 30° engage the collective FTR and increase power to maintain height (approx 5-10% Tq). Check the Tq limits. Try not to pull back on the cyclic to maintain the height during the turn as this will reduce speed. If during the maneuver VSI displays a ROD > 500ft/min then roll off the angle of bank and adopt wings level attitude and start the maneuver again. On rolling out remember to take off any power that you may have applied as you pass back through 30°.
3. Turning using the cyclic beep trim. As per the standard and medium turn, however, a larger amount of collective power will be needed to maintain height. It has the same advantages and disadvantages as the standard turn.
4. Turn using the FTR. Use the horizon and the disc attitude to visually judge 45° and confirm with the roll indicator. As you pass through 30° engage the collective FTR and apply power to prevent any ROD. Check the Tq limits. Release the cyclic FT at 45°. Make any adjustments to pitch using the cyclic beep trim, allow the corrections to settle and then check the VSI, and if required adjust the power to maintain height. On rolling out remember to take off any power that you may have applied as you roll back through 30°. It has the same advantages and disadvantages as the standard turn.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:
    a. Lookout in the direction of turn.
    b. Monitor fuel and engine instruments.
    c. Tq awareness during Steep Turns

NOTES FOR THE STUDENT

1. It is important to maintain eyes out during the turn and not to fly on instruments. The AOB should be judged visually by using the attitude of the disc and the angle it cuts on the horizon backed up and confirmed by the roll indicator on the PFD.
2. Monitor the automation being used and ensure the aircraft is flying the expected flight profile.
3. Maintain lookout and SA whilst turning especially with regards to other aircraft

COMMON ERRORS

- Not being able to maintain a stable bank angle,
- Allowing deep altitude loss.
- Not being able to prevent the speed increase.
- Being late at the exit.

FUEL FLOW CONTROL

STANDARDS

- Comparison of the fuel at departure time with the total fuel required.
- Fuel consumption control at 15-30 minutes following the first reading 10 minutes after switching to level flight or entering operation conditions.
- If actual fuel consumption varies from planned values and the flight cannot be completed with the required reserve fuel, implementation of the reserve course of action.
- Frequent checking of fuel amount and fuel consumption throughout the flight.

DEFINITION

- Fuel Check Before Takeoff: The total fuel in the tank is determined. It is compared to the required fuel calculated in pre-flight planning. If the fuel is insufficient, the helicopter is refueled.
- Initial Air-Fuel Check: After the helicopter is leveled and the appropriate power settings, the total amount of fuel and the reading time are recorded.

- Fuel Consumption Check: 10 min. after the helicopter is at the operation flight altitude time and the remaining fuel are recorded. The remaining fuel is checked and noted in 15-30 minutes. Fuel consumption rate, end and reserve fuel start time are calculated and recorded. Considering the reserve fuel required, it is decided whether the remaining fuel is sufficient to complete the mission. If the amount of fuel is insufficient, the backup course of action is applied.
- Fuel Amount and Expenditure: The amount of fuel and expenditure rate are periodically checked. If the fuel quantity and flow deviate from the calculated values, the fuel flow calculation is repeated to determine if the fuel is sufficient to complete the flight.

IFR MANEUVERS

INSTRUMENT TAKE OFF

GROUND SCHOOL REFERENCE

RFM, Limitations. VNE, Met considerations Icing.

PRE-FLIGHT BRIEF

Aim for the student:

To conduct an instrument takeoff with sole reference to instruments.

Teaching points:

Demonstrate how to calculate: Safety Altitude (SA), Minimum safe flight level (MSFL), Minimum usable flight level (MUFL), and Transition level (TL)

TECHNIQUE

Generally, the initial instrumental take off with the SP does not differ from any other aircraft. The student must be familiar with AW109SP cockpit, the Chelton symbology the indications and its functions. The Instrument take off for training is practiced with the use of “Foggles” or a” Limited View Device” in order to maintain sole reference to instruments.

Once aligned on the runway in a visual hover (Foggles or hood up) with pre take off checks completed the instructor puts the student onto instruments then immediately continues as follows:

Apply power by 15-20% TQ and simultaneously rotate nose 5° below horizon. Helicopter will start accelerating and climbing:

The student must monitor the VSI to establish and maintain a positive rate of climb of at least 500fpm and allow the airspeed to accelerate towards 80 KIAS (Vy). At 200ft and with a positive rate of climb landing gear up and confirm RPM reduces to 100%. Vy is maintained throughout the climb up to 1000ft AGL, then can be increased to cruise climb as required.

Instructor demonstrates.

Student practices.

PRACTICAL INSTRUCTOR TIPS

The take off with “Foggles” is for training only. For an operational IFR take off it is a visual maneuver until 200ft at which time the pilot converts their full attention onto instruments, (unless conducting a “Low Visibility Takeoff”).

Minimum IFR Airspeed is 55 KIAS, either with or without coupled FD and on final approach.

Maximum IFR Airspeed is VNE – 20 KIAS

Maximum IFR approach airspeed single pilot is 115 KIAS.

Note that during takeoff Vy will be maintained to 1000ft AGL. For training purposes up to 1000ft the helicopter will be flown manually, after that Autopilot may be engaged for further climb or for levelling off.

STRAIGHT AND LEVEL FLIGHT

GROUND SCHOOL REFERENCE

RFM, Engine, transmission and airspeed limitations

PRE-FLIGHT BRIEF

Aim for the student:

To be able to fly straight and level in balanced flight at selected altitude and airspeed with sole references to instruments.

Teaching points:

Explain the scan used to achieve straight and level. That the usual “T” scan of an analog cockpit is now all on one page, the PFD. The scan is as follows:

PFD

Reference attitude AI

Speed – Left of screen

Ht and VSI – Right of screen

Turn slip indicator and compass heading – Top of screen

Conventional balance ball – Underneath both Chelton’s

Note that the MFD can be used for the compass rose. However, the disadvantage is the scan radius is then increased.

Explain how a speed of 120 KIAS is reached and maintained in straight and level flight by coordinated use of flight controls and power.

Describe the power and attitude combinations to maintain airspeed settings used for straight and level cruising flight.

Describe how to correct attitude by use of cyclic, force trim, and beep trim.

TECHNIQUE

Demonstrate straight and level flight at 100 and 120 KIAS /1000ft AGL (or more) by sole reference to instruments.

Student practices.

Demonstrate attitude/power adjustments to maintain selected parameters by sole reference to instruments.

Student practices.

PRACTICAL INSTRUCTOR TIPS

In order to maintain accuracy it is important not to focus on a single parameter but to maintain the selective radial scan switching focus from the main AI out to individual parameters and always back to the main AI.

Correct use of the trim system is paramount when maintaining S&L and use of the beep trim to fine tune the attitude and AOB.

SPEED CHANGES

GROUND SCHOOL REFERENCE

RFM, Airspeed limitations

PRE-FLIGHT BRIEF

Aim for the student:

To change speed with sole reference to instruments whilst maintaining altitude and heading.

Teaching points:

Explain the scan needed in order to change the speed and the parameters of concern when changing the attitude.

Explain the importance of the balance ball during this maneuver. Explain the different trim techniques for conducting this maneuver.

TECHNIQUE

Starting from a nominated speed 120 KIAS demonstrate to the student how to reduce and maintain the speed of 80 KIAS maintaining height and heading. Once speed stable at 80 KIAS increase the speed back to 120 KIAS.

Include, when demonstrating how the collective trim is used in the uncoupled mode, the aircraft balance is maintained throughout and the fact that the turn-coordination, whilst ATT mode is engage, is maintaining heading.

The student practices reducing speed to 80 KIAS and then back to 120 KIAS. (Or as directed)

Once the student is proficient and is scanning at a speed which is maintaining parameters show the same manoeuvre but this time with the holds engaged. This allows them to get familiar with the trim switches on both the cyclic and collective and also the PFD indications.

PRACTICAL INSTRUCTOR TIPS

When conducting speed changes demonstrate doing so with the use of the beep trim first and then only once the student is proficient demonstrate that it can be done with the use of force trim but explain the disadvantage of doing so, workload, instability etc.

COMMON ERRORS

The student may demonstrate a poor scan and be focusing on the main AI and on the pitch change required to adjust speed to the detriment of other parameters, most commonly the heading.

ALTITUDE CHANGES – CLIMB AND DESCEND

GROUND SCHOOL REFERENCE

RFM, Rates of climb graphs.

PRE FLIGHT BRIEF

Aim for the student:

To be able to climb and descend with sole reference to instruments whilst maintaining KIAS and heading.

Teaching points:

Explain the scan needed in order to change the altitude of the aircraft and the main parameters i.e. the VSI and BARALT, when climbing and descending.

Explain the importance of the balance ball during this maneuver due to the collective inputs required.

Explain the importance of attitude maintenance in both pitch and roll (Although whilst ATT is engaged the aircraft should maintain these automatically).

Explain the different trim techniques for conducting this maneuver.

TECHNIQUE

Starting from a nominated height >1000ft agl demonstrate to the student how to climb the aircraft at 500fpm to a nominated height 1000ft above the starting altitude maintaining speed and heading. Demonstrate the level off. Once established at the new altitude, demonstrate the descent at 500fpm back to the starting altitude, and level off.

Include, when demonstrating, how the collective trim is used in the uncoupled mode and how the aircraft balance is maintained throughout, and the fact that the turn-coordination, whilst ATT mode is engage, is maintaining heading. However, show the limitations of the turn co-ordination if the collective is moved too quickly.

Student practices using varying but nominated ROC and ROD fpm.

Once the student is proficient manually flying the maneuver demonstrate the use of the holds and then let the student practice. This allows them to get familiar with the trim switches on both the cyclic and collective and also the PFD indications.

PRACTICAL INSTRUCTOR TIPS

When conducting altitude changes point out that the aircraft should maintain the pitch attitude whilst the collective is being either raised or lowered, and that there is little need to use the beep trim to maintain the attitude and therefore the speed.

COMMON ERROR

The student may demonstrate a poor scan and be focusing too much on the VSI and miss the desired altitude.

Poor selective radial scan.

STANDARD, MEDIUM AND STEEP TURNS

GROUND SCHOOL REFERENCE

RFM, Limitations, Weight and power relationship when turning, Increased G in steep turns.

PRE-FLIGHT BRIEF

Aim for the student:

To be able to conduct turns with sole reference to instruments whilst maintaining KIAS, altitude and heading.

Teaching points:

Explain or revise the calculation of a rate 1 turn and the importance of using it when flying IFR.

Use the formula:

Speed divided by 10 + half the A/S

Example at 120Kts = 120/10 = 12 + half A/S = 12+6 Rate 1 turn = 18 Degrees

For ease in high workload situations, you can use the formula:

Speed divided by 10 + 7

Example at 120Kts = 120/10 = 12 + 7 = 12+7 Rate 1 turn = 19 Degrees

Revise the AOB required for a Medium and Steep turn.

- Medium = 30°
- Steep = 45° (VFR only). Explain to the student that it is not good practice to turn more than 30° when in cloud due to disorientation and various other factors. Power, collective input and increased weight. ???

Explain the scan needed in order to change and maintain different angles of bank (AOB) and the main instruments to be monitored during the selective radial scan i.e. the compass, ball and turn slip indicator.

Explain the importance of the balance ball during this maneuver due to the AOB, collective inputs required maintaining height and how much assistance is required for the turn co-ordination.

Explain the anticipation required and how to roll out from a turn.

Explain the different trim techniques for conducting this maneuver.

- Fly "against the springs"
- Use the beep trim only
- Use the force trim only

TECHNIQUE

- Starting from a nominated heading and speed demonstrate to the student how to turn the aircraft through 360° using a rate 1 turn using the 3 different trim techniques and roll out.
- Starting from a nominated heading demonstrate to the student how to turn the aircraft through 360° using a medium turn using the 3 different trim techniques whilst maintain height and speed and roll out.

• Starting from a nominated heading demonstrate to the student how to turn the aircraft through 360° using a steep turn using the 3 different trim techniques whilst maintain height and speed and roll out. Why are we demonstrating steep turns in IFR? Surely this is a VFR only maneuver.

Include, when demonstrating, how the collective is used to maintain height in conjunction with the pitch attitude in the uncoupled mode. Explain how the aircraft balance is maintained throughout, and the fact that the turn-coordination, whilst ATT mode is engaged, is maintaining balance but may need assistance with a small amount of in-turn pedal.

Student practices the 3 different AOB turns onto various headings using the different trim techniques.

Once the student is proficient manually flying the manoeuvres demonstrate and then let the student practice with use of the holds. This allows them to get familiar with the trim switches on both the cyclic and collective and also the PFD indications.

PRACTICAL INSTRUCTOR TIPS

When conducting turns point out that the aircraft should maintain the pitch attitude whilst turning. However, there may be a need to use the beep trim to help maintain the attitude and therefore the speed.

COMMON ERRORS

The student may demonstrate a poor scan and be focusing too much on the AOB and or height and roll through the desired heading.

Poor selective radial scan.

LEVEL CLIMBING AND DESCENDING TURNS

GROUND SCHOOL REFERENCE

RFM, Limitations, Rate of Climb graphs, Weight and power relationship when turning.

PRE-FLIGHT BRIEF

Aim for the student:

To be able to climb, descend and turn with sole reference to instruments whilst maintaining KIAS.

Teaching points:

Explain:

- the co-ordination required to turn and climb at the same time, level off and roll out on heading.

- the scan needed in order to climb/descend and turn maintaining different angles of bank (AOB) and different rates of climb.

- the main instruments to be monitored during the selective radial scan i.e. the AOB, compass, VSI, ball and turn slip indicator.

- the timed co-ordination when turning through 360° and climbing or descending through 1000ft.

For example, a coordinated rate 1 climbing turn through 1000ft at 500fpm ROC and turning through 360° should take 2 minutes.

- the practical uses of such a maneuver i.e. ATC or Approach plate instructions.

TECHNIQUE

Instructor demonstrates:

• Starting from a nominated altitude, heading and speed demonstrate to the student how to climb through 1000ft turning the aircraft through 360° using a rate 1 turn and using 500fpm ROC.

• Starting from a nominated altitude, heading and speed demonstrate to the student how to descend through 1000ft turning the aircraft through 360° using a rate 1 turn and using 500fpm ROD.

Allow the student to practice using the trims as required.

Once the student has achieved the above, move onto timed coordinating turns.

The method for timed coordinating the turn is as follows:

Initiate the climb by raising the collective. As the ROC goes through 300fpm start the turn and start the clock. Adjust the collective to maintain 500fpm and the cyclic to rate 1 AOB. At 1 min assess the altitude, it should be at the intermediate 500ft, and compass should be 180° from start heading. If the parameters are not as this then adjust the ROC or AOB to hit the target altitude and heading on the timing.

Allow the student to practice.

Once proficient at the coordinated maneuver demonstrate the maneuver with holds engaged and then allow the student to practice using the holds. This allows them to consolidate the trim switches on both the cyclic and collective and also the PFD indications.

PRACTICAL INSTRUCTOR TIPS

Use cardinal headings for the initial demonstration and practice, and then vary the start headings and altitudes.

This maneuver is easier to conduct using the beep trim but it is important to show and consolidate all the trimming techniques.

Remind the student about the turn co-ordination and pitch control when climbing and descending.

COMMON ERRORS

Not identifying the power required to maintain the ROC/D and be focusing too much on the AOB.

Allowing the speed to reduce or increase during the climb/descent.

The student may demonstrate a slow scan not adjusting as necessary power and AOB to hit the targets during the coordinating turn.

Poor selective radial scan.

DESCENT IN AUTOROTATION AND POWER RECOVERY

GROUND SCHOOL REFERENCE

RFM, Speed Limitations power off. Autorotative envelope.

PRE-FLIGHT BRIEF

Aim for the student:

To be able to safely conduct an autorotation with sole reference to instruments and conduct a powered recovery.

Teaching points:

Explain

- the difference between a full autorotation and an emergency autorotative descent.
- the scan required for this maneuver. Need to include NR and TQ.

Calculate the MSFL for use during this exercise as this is the height at which they will recover the aircraft.

Explain that during a real emergency autorotation no turning below MSFL (you are getting too close to the ground and the focus should be to monitor inside and outside the cockpit to try to find a cloud break).

Airmanship points:

- Wind awareness.
- Engine Checks pre autorotation.
- For real emergency (i.e., in cloud) it is important to know your geographical location and cloud base at all times during IFR.

TECHNIQUE

Instructor demonstrates:

- From an altitude (3-4000ft), enter autorotation with sole reference to instruments. Explain the different scan, trim techniques and maintain NR between (95% to 110%).

- During the descent maintain 80 KIAS and carry out some turns (turning into wind).
- Approaching MSFL, increase power and recover the aircraft to straight and level flight. Check engine response, temperatures and pressures.

Allow the student to practice.

Once proficient demonstrate how the use of the holds during autorotation. IAS hold to maintain the speed and the HDG to turn towards the wind and to maintain heading.

PRACTICAL INSTRUCTOR TIPS

Tell the students that when lowering the collective, they should do so in a gradual manner but keep lowering it until the Nr starts to increase.

Tell them to use their force trim to set approx. 5° nose up when lowering the collective. This will reduce the KIAS. As the KIAS approaches 85 KIAS, they can use the beep trim to lower the nose slightly to acquire and maintain 80 KIAS.

COMMON ERRORS

Students

- may over control the aircraft especially the collective resulting in fluctuating Nr.

- may hold the cyclic force trim engaged for too long.

- may not monitor the altitude during the descent.

- may not maintain good balance.

RECOVERY FROM UNUSUAL ATTITUDE

GROUND SCHOOL REFERENCE

RFM, Limitations

PRE-FLIGHT BRIEF

Aim for the student:

To be able to recover safely from an unusual attitude and get back to safe parameters.

Teaching points:

Discuss the reasons and situations how the student could find themselves in an UA, the importance of recognition and swift recovery action.

Explain the correct technique for the recovery of an Unusual Attitude.

There is a mnemonic which can help. WASP

- Wings Level and ball in the middle
- Attitude - Select close to the horizon and speed stable (5 - 7° nose up).
- Speed - Check
- Power - Adjust

Explain why speed is checked before applying power (Vortex Ring)

Explain the trim techniques during the recovery.

Explain the Unusual Attitude Recovery Mode (UAR) on the PFD.

- When the pitch exceeds ± 50° the PFD automatically displays the UA recovery mode (UAR). In UAR mode, all navigation, terrain and obstruction symbology are removed. The flight path marker is removed and the waterline is expanded. The pitch limit indicator is retained to provide enhanced low speed awareness, and a horizon cue (silver of blue or brown) is always shown, to indicate the closest direction to return to the straight and level flight. Large red chevrons point to the horizon. The display returns to normal when the pitch and roll are within ±5°.

Explain the wings level function. (WLVL)

- The Wing Level mode provides fast and controlled return to near zero pitch (6°) and roll attitude with a precision of ±0,5° in pitch and of ±1° in roll attitude respectively.
- The WING LEVEL mode operates on the pitch and roll axis simultaneously and independently.
- The mode is engaged by pressing the WING LEVEL button on the collective stick grips. When the mode is engaged, two green WLVL annunciations are displayed on the lateral and longitudinal annunciation fields of the PFDs. The mode has highest priority and automatically disengages other engaged modes.

TECHNIQUE

Instructor demonstrates the recovery from a UA starting from parameters (this will give something to return to once the recovery has been made) a safe flight condition.

Student practices 2 types of UAs.

- High speed high AOB
- Low speed high ROD.

Give the student their start parameters, i.e. 100 KIAS 3000ft AMSL heading North. Get the student to close their eyes. Put the aircraft into the first unusual attitude. When an appropriate UA has been attained, say "Your controls" and student will resume control of the aircraft and recover using the correct technique and get back onto their safe parameters.

Do the same for the second type of UA.

Demonstrate (if VMC) the UAR mode.

Demonstrate the wings level function. (WLVL)

PRACTICAL INSTRUCTOR TIPS

Tell the students that on receipt of the controls, they should depress the cyclic force trim, set an approximate attitude and LET GO OF THE FORCE TRIM. Once this "approximate" attitude has been set and the ball is in the middle, the students can then improve on this attitude by use of the beep trim, (or force trim if required).

Keep scanning. Do not focus on only one source of information.

COMMON ERRORS

Students may have difficulty in interpreting what they are seeing on their instruments when they resume control of the aircraft.

Students may tend to focus for too long on one aspect of the unusual attitude at a time. For example a student may spend too long trying to get the wings exactly level before properly adjusting, power settings or stopping a descent.

Students may hold their force trim button for too long. This results in a "loose cyclic" and may result in the student recovering from one unusual attitude but inadvertently establishing another one.

RADIO NAVIGATION PATTERNS: NDB, VOR, GPS

GROUND SCHOOL REFERENCE

IFR limitations, MET.

PRE-FLIGHT BRIEF

Aim for the student:

To navigate using the aircraft equipment.

Teaching points:

Explain the pre-flight checks that are required before IFR flight. Radio, Nav aid and instrumentation checks.

Revise the differences between NDB, VOR and GPS for navigation. Their limitations and uses during different stages of flight.

Explain the equipment that is in the aircraft for navigation. ADF, VOR radio, GPS.

Revise QDR and QDM Chelton emulator revision.

TECHNIQUE

The following exercises are first to be done with holds engaged (but NAV uncoupled). This allows the students to focus their attention on symbology, cockpit set up and navigation management.

Set up the MFD and tune the comms to an NDB frequency. Allow the student to set up their display on the MFD showing the ADF bearing pointer. Navigate towards the NDB and demonstrate an intercept QDM and QDR.

Allow the student to practice tracking QDM and QDR's

Tune a VOR frequency. Demonstrate, and get the student to configure their MFD to display the MFD VOR bearing pointer and CDI. Explain the difference between the 2 and then demonstrate how to track a QDM with first the bearing pointer and then the CDI.

Allow the student to practice tracking QDM and QDR's

Set up a basic route into the GPS. Allow the student to set up the MFD showing the map in the correct scale and the navigation in the FMS mode. Demonstrate how to fly the FMS GPS in the uncoupled mode.

Allow the student to practice.

Conduct all of the above coupled to show the aircraft capabilities. Highlight any points which could cause problems to navigation.

PRACTICAL INSTRUCTOR TIPS

During this exercise it is important that the student becomes familiar with the buttons on the MFD and PFD.

Cockpit management and display management needs to be practiced. Give the student the opportunity to "play" with the displays and discover some of the advantages and disadvantages.

COMMON ERRORS

Students may have difficulty in reading the needles correctly (reading the head instead of the tail when trying to determine a radial etc).

Students may try to read radial information from an incorrect needle or from the course bar.

Students may have problems finding their way around the MFD and PFD pages. It requires practice so allow every opportunity for this.

Demonstrate and coach but do not touch the student's displays.

APPROACH TO LANDING: NDB, VOR, ILS, GPS

GROUND SCHOOL REFERENCE

IFR limitations, Weight and Balance Charts. Met Info and applicable NOTAMs for destination airport only.

Instrument approach charts as required for departure and destination airports.

Performance charts as required.

PRE-FLIGHT BRIEF

Aim for the student:

To conduct a series of approaches using the aircraft equipment.

Teaching points:

Explain the pre-flight checks that are required before IFR flight. Radio, Navaid and instrument checks.

Explain the importance and give an example of an approach plate brief.

Give an explanation of DH/DA and MDH/MDA and the point at each when a decision must be made to either continue to land or carry out a missed approach.

RADALT setting procedures.

Normal approach speed is 100 KIAS.

Explain the GPS approach.

TECHNIQUE

The first approach should be a coupled ILS in order to demonstrate the capabilities of the aircraft and allow the student the capacity to observe the required set up, cockpit management and checks.

During the aircraft setup for the ILS the PF should be constantly maintaining their instrument scan. They should be looking away from the instruments for not more than 5 seconds at a time if the aircraft is coupled and 3 seconds if uncoupled, dividing their attention between the instrument scan and the approach. During this phase, maximum use of the available automation shall be emphasized.

Explain the navigation setup – for example:

- Comm. 1: active freq. on ATC that we are in contact with;
- Comm. 1: stby freq. on next ATC we are expecting to switch to;
- Comm. 2: listening freq. on GUARD 121.5 or momentarily ATIS;
- Comm. 2 stby freq. on ATIS/VOLMET/Company

Demonstrate the briefing, set up and checks required before the approach (including RADALT)

 For standardization the RADALT should be set to:

- The Minima for a precision approach with a DA/DH
- 100ft above the minima for a non-precision approach with a MDA/MDH

Once the setup is complete, the student should concentrate only on flying the approach. In order to fly a coupled ILS approach, they will have HDG, ALT and IAS and be following heading directions provided by ATC.

When cleared to and in a position for intercepting the final course, they must confirm that the correct NAV source is selected and then press the APP button on the AMPS confirming “A” is displayed. The engagement of the LOC and GS will be confirmed by the change of letter to “C”. The pilot should crosscheck the correct alignment and altitude steps in order to prevent false LOC or GS captures.

Continue to descend by the sole reference to the instruments until 100 ft above the Minima where a split attention between the outside reference and the instruments should be given.

VOR Approach

Student conducts the:

- Cockpit set up
- Briefings
- Navigation management
- Flies the VOR approach uncoupled but holds engaged.

NDB Approach

Student conducts the:

- Cockpit set up
- Briefings
- Navigation management
- Flies the NDB approach uncoupled manually. (With instructor assistance if necessary)

GPS Approach

Demonstrate a GPS approach using the published procedure and related instrument as a backup demonstrate only how the GPS system works. (VMC only).

PRACTICAL INSTRUCTOR TIPS

Ensure aircraft is trimmed during approach.

Point out that aircraft performance has a direct effect on the airspace and visibility needed to perform the maneuvers. The most significant performance factor is aircraft speed. For that reason, strictly apply the minima for the category of the aircraft depending on the speed used on the final segment.

Point out that the ILS obstacle clearance surfaces assume that the pilot does not normally deviate from the center line more than half a scale deflection after being established on track.

Point out that the Glideslope interception should always be ‘’From Below’’ in order to avoid false glide.

Point out that the pilot should always have a secondary way to monitor the approach, both in the horizontal and in the vertical path.

In the event of loss of glide path, the procedure becomes a non-precision. Change the minima accordingly.

Point out that flying manually does not relieve the student of their responsibility to fly properly turns at fly-by waypoints, at fly-over waypoints or using fixed radius turns.

All approaches should be flown at 100 KIAS.

COMMON ERRORS

The student may have difficulty in maintaining spatial orientation.

The student may have difficulty in managing workload if students become slightly overwhelmed by "information overload" being in an unfamiliar environment.

It is very easy for the student to "fall behind the aircraft".

Students may forget to descend in accordance with the plate.

Students may descend below MDA/MDH or not recognise when descending through DA/DH

MISSED APPROACH PROCEDURES (MAP)

GROUND SCHOOL REFERENCE

RFM, IFR CHARTS, MET.

PRE-FLIGHT BRIEF

Aim for students:

To be able to safely conduct a GA and a missed approach.

Teaching points:

Explain to the student when the MAP must be initiated and the differences between DA (H) MDA (H) and MAP. Emphasize that a MDA (H) is exactly as it says and under no circumstances should a pilot descend below it until the correct visual references have been observed. Use a series of charts to do this, preferable the destination airfields. Confirm total understanding before flight.

Emphasize the importance of the approach briefing and Missed approach procedure.

Explain the methods of going around manually, with use of the AFCS and the function of the GA on the collective.

Explain to the student at what point during the MAP to finish in the GA mode and when to set up and engage the holds, ALTA, IAS and HDG.

TECHNIQUE

Demonstrate the GA (using the collective button) and MAP. Let the student watch what happens to the aircraft flight profile and symbology during the use of the GA function.

Student practices and consolidates missed approach procedures both manually and with the GA function.

PRACTICAL INSTRUCTOR TIPS

The “Go Around” (GA) button is used primarily in case of a missed approach. It is an automatic level off and ascent. It climbs at 700ft/min and Vy (80 KIAS); - these references cannot be modified. HDG mode is automatically activated.

It is engaged by selecting the collective GA/TU button. GA cannot be activated if airspeed <40kts vertical speed is near 100ft/min and radar height >200ft.

Get the student into the mentality of: "Treat every approach like you are going to conduct a missed approach" that way you will never be unprepared.

Get the student to physically confirm the location of the GA button during the approach.

Allow the student to carry out the full MAP including any cockpit management of radios etc.

Point out that the ATC will expect that the pilot will fly the missed approach as published. If any deviation should become necessary, advise ATC.

Common errors are:

Not preparing the aircraft for a missed approach.

It is quite common for the student to press the wrong button when trying to select Go Around.

Forgetting to change to VOR/Navigation frequencies during the go around.

SID

GROUND SCHOOL REFERENCE

RFM, IFR Charts, Climb performance.

PRE-FLIGHT BRIEF

Aim for the student:

To be able to conduct a standard instrument departure.

Teaching points:

Brief the IFR SID chart pre-flight.

Explain the importance of "Validity of the database".

TECHNIQUE

Demonstrate and then allow the student practice the SID using the FD.

PRACTICAL INSTRUCTOR TIPS

Point out that if a SID is cancelled by the ATC by the phrase ''CANCEL SID'', then the ATC shall reissue alternative departure instructions (very often radar vectors).

Pilots should be aware if the aircraft is capable of performing (in those conditions) the prescribed SID climb gradient.

Point out that the SID assumes no turns before the departure end of the runway and before 400 ft above the aerodrome elevation.

Point out that if the SID is an RNAV type, then the pilot must verify that the aircraft will be able to meet the RNP requirement specified for each segment.

ROUTE

GROUND SCHOOL REFERENCE

RFM, Airspace restrictions, Limitations

PRE-FLIGHT BRIEF

Aim for the student:

To navigate a route.

Teaching points:

Route brief.

Chelton emulator revision

TECHNIQUE

Build a route navigating via LNAV, VOR or NDB as appropriate. Fly in the uncoupled and coupled mode, with and without the use of holds.

PRACTICAL INSTRUCTOR TIPS

Allow time for the student to practice MFD manipulation and navigation and cockpit management.

COMMON ERRORS

Poor situational awareness.

Incorrect symbology, therefore degrading situation and spatial awareness.

STAR

GROUND SCHOOL REFERENCE

RFM, IFR Charts.

PRE-FLIGHT BRIEF

Aim for the student:

To conduct a standard arrival at a selected airfield.

Teaching points:

Brief the IFR STAR chart pre-flight.

TECHNIQUE

Demonstrate and then allow the student to practice the STAR using the FD

PRACTICAL INSTRUCTOR TIPS

Point out that a STAR is designed to reduce pilot and controller workload, maximize traffic handling and minimize conflict with departing traffic. In a STAR there is always an ARRIVAL ROUTE (while the TRANSITION ROUTE only if necessary).

Point out the VERTICAL and the SPEED RESTRICTIONS as well as the MSA for assuring vertical separation.

Point out that a STAR is always composed by a text description and a STAR diagram. The student shall comply with both of them.

Point out that once a STAR clearance has been issued, it remains valid unless ATC cancels it by saying ‘’CANCEL STAR’’.

COMMON ERRORS

It is very easy for the student to "fall behind the aircraft".

Students may have difficulty in setting up the optimum displays for the phase of flight and may require prompting (use of bearing pointer, CDI, VOR 1 and VOR 2 needles etc).

ENGINE FAILURE DURING TAKE OFF, AFTER TDP IN IMC

GROUND SCHOOL REFERENCE

RFM, OEI Performance charts, MET, Diversion criteria.

PRE-FLIGHT BRIEF

Aim for the student:

To safely recover the aircraft following an engine failure after TDP in IMC.

Teaching points:

Explain that if a one engine condition occurs during the take off but before entering IMC the pilot should maintain VMC and inform ATC.

Discuss the Pre-take off briefing and its importance.

Explain that in the event of an OEI condition occurring during takeoff after entering IMC the pilot should first inform ATC and continue the take off as per ATC or SID instructions. Once established in the climb at a safe altitude >1000' AGL RFM checks for OEI should be carried out. The pilot must then prepare the aircraft to be landed at either the take off airfield or at the alternate

Discuss the OEI RFM actions.

TECHNIQUE

Demonstrate an Engine Failure during takeoff including the maneuver profile and the cockpit set up.

Allow the student to practice.

PRACTICAL INSTRUCTOR TIPS

Many students will find dealing with a major malfunction whilst already in a high workload environment highly taxing.

COMMON ERRORS

Students may tend to attempt to deal with the malfunction with detriment to the safe flying of the aircraft

GO AROUND WITH ONE ENGINE INOPERATIVE

GROUND SCHOOL REFERENCE

RFM, OEI Performance charts, MET, Diversion criteria. Single engine climb parameters.

PRE-FLIGHT BRIEF

Aim for student:

To safely conduct a GA and MAP with one engine inoperative.

Teaching points:

Brief that during the ILS it will be simulated that the weather is poor and the student will not be visual at DH.

Describe the OEI missed approach maneuver highlighting the difference between an OEI and both engines operating missed approach i.e., speed should be reduced to Vy with OEI but normal cruise climb should be used with both engines operating.

CONDUCT OF THE EXERCISE

During a coupled approach give the student OEI training. Give the emergency at a time in order to allow the student to go through the "touch" drills for an OEI. Take control and demonstrate the procedure for an OEI GA at DH.

Student practices.

TECHNIQUE

During the missed approach procedure, the student needs to prioritize actions and manage their workload. Get them to carry out a full MAP. This will involve high workload/cockpit management (go around/After T/O checks/climb/OEI/change Nav VOR etc.) from the student especially if single pilot.

Use the 2.5min power when conducting the MAP and once established safely in the climb above 200ft at Vy reduce the power to max continuous (but ensure at least 550ft fpm ROC).

2.AW109.2 FLIGHT MANEUVERS REFERENCE LIST

Flight Manuals of all aircraft included in the authorization chart of our ATO.

All normal maneuvers to be performed in the trainings are detailed in AW109 RFM PART 1 Section 2 Normal Procedures. The training will be based on the principles of this section.

All emergency maneuvers to be performed in the trainings are detailed in AW109 RFM PART 1 Section 3 Emergency and Malfunction Procedures. The training will be based on the principles of this section.

CAT A MANEUVERS

All CAT A maneuvers to be performed in the trainings are detailed in AW109 RFM Supplement 4 CAT A Operations. The training will be based on the principles of this section.

KAAN AIR

BRIEFING AND FLIGHT MANEUVERS (AW-139)

2.AW139. BRIEFING AND FLIGHT MANEUVERS

2. AW139.1 FLIGHT MANEUVERS

2. AW139. BRIEFING AND FLIGHT MANEUVERS

2. AW139.1 FLIGHT MANEUVERS

VFR FLIGHT MANEUVERS

STRAIGHT AND LEVEL FLIGHT

STANDARDS

- Airspeed: 120 KT ± 5 KT.
- Altitude: ±50 Feet
- Heading: ± 10°

DEFINITION

1. This exercise introduces co-ordination of all three controls. Accuracy is most important but do not concentrate on one control to the detriment of the other two. Try to anticipate the control movement required and thereby, prevent errors rather than correct them. Use external references as much as possible and avoid 'flying on instruments.

2. Using the Upper Modes to maintain straight and level flight gives you, the pilot, more time for "eyes out" of the cockpit to maintain a better lookout and to manage other aspects of the flight, especially navigation. However, it is critically important to always monitor the automation to ensure the aircraft is flying the expected profile.

TECHNIQUE

1. Straight flight is maintained by ensuring that the 'wings' are level and that the aircraft is flying in balance.

2. Level flight is maintained by controlling attitude (speed stable attitude) and therefore airspeed with cyclic stick and height with collective lever (power or Tq). Understanding attitude and power combinations is important in order to fly smoothly and accurately. Normally, airspeed/height errors are small and therefore, only small corrections are required. Should an error occur, consider correcting the airspeed first as this may also correct the height error. For example; speed is higher than planned and you are descending so adjust the attitude to reduce speed and this will also correct the descent. Be patient and allow time for the corrective action to take effect.

3. The power required to maintain S&L flight varies with airspeed. As airspeed increases the power required reduces to a minimum at Vy (80 KIAS). Thereafter, the power required increases as airspeed increases (at 120 KIAS in straight and level flight at 6400kg on a standard day, power will be is approximately 60% PI or maybe a little less).

4. To select and maintain 120 KIAS engage the FTR on the collective and then set the approximate power required for 120 KIAS. At the same time use the beep trim on the cyclic to adjust the pitch for a speed stable attitude; approximately 2° deg pitch. Note that on the 139, except at the high end of the speed range, 0° is an accelerative attitude You will be able to confirm that the aircraft is speed stable by the speed trend indicator beside the speed tape on the left hand side of the PFD.

5. Check that there is no ROC or ROD on the VSI on the right hand side of the PFD (see above). If there is, check that the speed is stable, if not then a small adjustment on the cyclic beep trim should correct the ROC or ROD. If the speed is stable then the power and therefore the collective will need an adjustment. Engage the FTR on the collective and adjust the PI as necessary.

6. As long as the aircraft is flown in trim, the roll pointer and slip/skid indicator will form a triangle. If a slip or skid is induced, the slip skid indicator will move sideways, becoming yellow as it reaches full scale. Normally, the turn co-ordination will be active and the aircraft should be in balanced flight. If it is not: engage the pedal trims put the ball into the middle and check the slip indicator.

7. Finally check that the "wings are level". If they are not then adjust the roll with the beep trim on the cyclic.

If a sideways drift is observed in the helicopter due to the side wind, the cyclic control opens into the wind. In proportion to the wind force, the head is turned into the wind and the cyclic control is brought back to its initial position, crab is given, and the helicopter is trimmed.

MAINTAIN STRAIGHT AND LEVEL FLIGHT WITH THE USE OF UPPER MODES

1. The Upper modes are engaged on the Guidance control Panel on the center console. For Straight and Level flight, you will be using HDG; ALT and IAS.

2. Each Mode, when selected will flash in green in the Mode Annunciator section at the top of the PFD. When engaged, they will change from flashing to a steady green. HDG and VS (Vertical Speed) are shown in the example below.

3. Engage IAS on the control panel. IAS will start flashing green on the Mode Annunciator Display while it engages. It will then change to a steady green once engaged. Get in the habit of confirming that each mode has properly engaged before moving on to your next action. Once IAS has engaged, the airspeed bug on the airspeed tape will change to magenta and the target IAS will display in magenta at the top of the airspeed tape.

4. Engage ALT on the control panel. ALT will start flashing green on the Mode Annunciator Display while it engages. It will then change to a steady green once engaged. In addition, the altitude pre-select bug on the side of the altitude tape will change to magenta.

5. Engage HDG on the control panel. HDG will start flashing green on the Mode Annunciator Display while it engages. It will then change to a steady green once engaged. In addition, the heading bug on the HSI Display on the lower part of the PFD will turn magenta and the legend HDG and the actual heading in numbers will be presented on the top right of the HSI.

6. Remember that turn co-ordination is active automatically so the aircraft balance will be maintained

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout. CRM “Heads in” “Heads out calls”

b. Monitor fuel and engine instruments.

c. Monitor the automation.

NOTES FOR THE STUDENT

1. Identify the beep trims on the cyclic and collective and keep your thumbs on them. This will avoid the need to keep looking inside the cockpit to identify them. Focus can then be on the PFD bugs to ensure correct selection of height, speed and heading.

2. As always, when using automation, the flight path of the aircraft must be monitored.

3. Maintain lookout and SA especially with regards to other traffic.

COMMON ERRORS

- Failure to trim the helicopter properly, tending to hold antitorque pedal pressure and opposite cyclic. This is commonly called cross-controlling.
- Failure to maintain desired airspeed.
- Failure to hold proper control position to maintain desired ground track.
- Failure to allow helicopter to stabilize at new airspeed.

TURNS

STANDARDS

- Airspeed: 100 KT ± 5 KT.
- Altitude: ±50 Feet
- Bank Angle: 15 º ± 5 º
- Rolling out of the turn: ± 5

DEFINITION

A turn is a maneuver used to change the heading of the helicopter.

1. The principle for turns is as you have utilized before (i.e. bank/balance/power). It is important that attitude is maintained from the initial application of ‘bank’ and that no attempt is made to chase minor speed changes.

As the turn is established, altitude is controlled with collective. If the aircraft attitude changes due to collective input, re-gain the required attitude with the cyclic.

2. There are 3 methods of turning the aircraft onto specified heading. They all have their advantages and adapting which method is best for the situation will be clear once they have been practiced. The methods are:

a. Against force spring pressure.

b. Engaging the FTR and releasing at the desired AOB.

c. Using the beep trim on the cyclic.

TECHNIQUE

Before beginning any turn, the area in the direction of the turn must be cleared not only at the helicopter's altitude, but also above and below. To enter a turn from straight-and-level flight, apply sideward pressure on the cyclic in the direction the turn is to be made. This is the only control movement needed to start the turn. Do not use the pedals to assist the turn. Use the pedals only to compensate for torque to keep the helicopter in trim around the vertical axis. Keeping the fuselage in the correct streamlined position around the vertical axis facilitates the helicopter flying forward with the least drag. Trim is indicated by a yaw string in the center, or a centered ball on a turn and slip indicator.

How fast the helicopter bank depends on how much lateral cyclic pressure is applied. How far the helicopter bank (the steepness of the bank) depends on how long the cyclic is displaced. After establishing the proper bank angle, return the cyclic toward the neutral position. When the bank is established, returning the cyclic to neutral or holding it inclined relative to the horizon will maintain the helicopter at that bank angle. Increase the collective and throttle to maintain altitude and rpm. As the torque increases, increase the proper antitorque pedal pressure to maintain longitudinal trim. Depending on the degree of bank, additional forward cyclic pressure may be required to maintain airspeed.

Rolling out of the turn to straight-and-level flight is the same as the entry into the turn except that pressure on the cyclic is applied in the opposite direction. Since the helicopter continues to turn as long as there is any bank, start the rollout before reaching the desired heading.

SLIPS

A slip occurs when the helicopter slides sideways toward the center of the turn. It is caused by an insufficient amount of antitorque pedal in the direction of the turn, or too much in the direction opposite the turn, in relation to the amount of power used. In other words, if you hold improper antitorque pedal pressure,

which keeps the nose from following the turn, the helicopter slips sideways toward the center of the turn.

SKIDS

A skid occurs when the helicopter slides sideways away from the center of the turn. It is caused by too much antitorque pedal pressure in the direction of the turn, or by too little in the direction opposite the turn in relation to the amount of power used. If the helicopter is forced to turn faster with increased pedal pressure instead of by increasing the degree of the bank, it skids sideways away from the center of the turn instead of flying in its normal curved path.

In summary, a skid occurs when the rate of turn is too great for the amount of bank being used, and a slip occurs when the rate of turn is too low for the amount of bank being used.

TURN ONTO NEW HEADING USING A STANDARD TURN WHILST IN LEVEL FLIGHT

1. A Standard Turn is defined as a Rate 1 turn. Rate 1 = 3° per second rate of turn. The angle of bank, therefore, depends on the speed of the aircraft.

Use the formula:

Speed divided by 10 + half the airspeed (A/S)

Example at 120 KIAS= 120/10 = 12 + half A/S = 12+6 Rate 1 turn = 18 Degrees

For ease in high workload situations, you can use the formula:

Speed divided by 10 + 7

Example at 120KIAS = 120/10 = 12 + 7 = 12+7 Rate 1 turn = 19 Degrees

2. Turning against spring pressure. Apply cyclic stick against the spring pressure. Try to apply a smooth rate of roll into and out of the turn, turn co-ordination will maintain balance. Height is maintained with collective lever; however, in turns of up to 30° AOB, very little adjustment should be necessary.

Anticipate the roll-out onto the new heading by smoothly releasing the cyclic spring pressure with 10° to go.

a. During the turn a small amount of forward or aft cyclic pressure may be needed to maintain speed.

b. This method is best suited for small heading changes.

3. Turn using the FTR. Engage the FTR on the cyclic and smoothly roll into the direction of the turn. Look at the angle of the disc on the horizon and try to visually judge the AOB, confirm with the roll indicator and release the FT. Turn co-ordination will maintain balance. If there have been any changes to pitch and therefore speed use the cyclic beep trim to adjust the attitude. Height is maintained with collective, but if there is a ROC or ROD on the VSI and the speed has changed wait until the input from the cyclic pitch change settles and then re-assess.

Anticipate the roll out with 10° to go by engaging the cyclic FTR and smoothly rolling out selecting the wings level attitude and speed stable pitch. Release the FT and then beep trim the fine adjustments. Check balance and trim the pedals

a. The advantage of this technique is that, providing the correct action is used by the pilot, it is very effective at rapidly reaching a required AOB (i.e. in an avoiding turn).

b. It is good for sustained turns of over 180° heading changes. Aircraft is in a trimmed condition.

The disadvantage of using this technique is that the aircraft is unstable in roll and pitch during the time that the FT is released. It is more difficult to accurately select the desired AOB and equally difficult to return the aircraft accurately to straight and level flight.

4. Turning using the cyclic beep trim. Using the beep trim on the cyclic push the button in the desired direction of turn. There is a small amount of lag but look at the horizon and try to visually judge the AOB required and confirm on the PFD roll indicator. Turn co-ordination will maintain balance. Again, height is maintained with collective; although, in turns of up to 20° AOB, very little adjustment should be necessary.

Anticipate the roll out by pushing the beep trim back to the wings level attitude degree for degree. For example, at 20° AOB start moving the beep trim 20° before the desired roll out heading. Check balance, power and wings level.

a. If the beep trim has only been moved laterally during the turn the attitude and therefore airspeed should not need to be adjusted.

b. An advantage to this method is that the aircraft is very stable in the turn and it is accurate selecting the required AOB.

c. It is good for sustained turns over 180°heading changes.

TURN ONTO NEW HEADING USING A MEDIUM TURN WHILST IN LEVEL FLIGHT

1. Medium angle of bank will be between 15° and 30°. For training Medium Turns will be performed at 30° angle of bank (AOB).

2. Turning against spring pressure. The technique is the same as above however the collective FTR will have to be engaged on the collective and the power increased to maintain the height, remembering to take off any power that you may have applied as you roll out of the turn. There may be a tendency to pull back on the cyclic. Try to maintain the pitch attitude in the turn. It is more difficult to maintain the desired AOB. Try not to over control, you may find it easier to have a solid arm position on your leg. There will be a need to “back out” of the roll slightly with cyclic to maintain 30° AOB

3. Turning using the cyclic beep trim. As per the standard turn, however, a small amount of collective power will be needed to maintain height. It has the same advantages and disadvantages as the standard turn.

4. Turn using the FTR. Use the horizon and the disc attitude to visually judge 30°confirm with the roll indicator but before you release the trim also check the pitch attitude. Once you release the FT at 30° make any further adjustments to pitch using the cyclic beep trim, allow the corrections to settle and then check the VSI and if required apply a small amount of collective power to maintain height. On rolling out remember to take off any power that you may have applied. It has the same advantages and disadvantages as the standard turn.

TURN ONTO NEW HEADING USING A STANDARD TURN WHILST IN LEVEL FLIGHT WITH THE USE OF FLIGHT DIRECTOR

1 Make sure the HDG bug is at the top of the HSI display on the PFD then engage the HDG mode on the Guidance Control panel

2. HDG will appear in green at the top of the PFD. The HDG bug at the top of the HSI will change from Cyan to Magenta and the HDG with digital readout will appear on the top right of the HSI display.

3. In the cruise at 120 KIAS change the heading reference using the cyclic TRIM (L/R positions). This will move the magenta bug on the HDG tape and change the numbers on the digital read out.

a. Note that if the HSI ARC display is selected, an angle 90° is presented, 45° to both left and right. If a heading change of more than 45° is made then the HDG bug will disappear out of sight to either left or right side is. If you need to turn more than this amount the HDG bug will move out of sight but the digital readout will continue to change (increase/decrease as appropriate).

4. The rate of turn will be controlled by the automation and should be calculated automatically as per a standard rate 1 turn.

5. Change of reference heading can also be done by rotating the HDG knob on the Remote Instrument controller. There is no facility for heading pre-selection once HDG Mode is selected and coupled. In other words, the aircraft will respond directly to the rotating heading bug which will remain magenta as it is rotated by the use of the knob.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout in the direction of turn.

b. Monitor fuel and engine instruments.

c. Tq awareness during Steep Turns

NOTES FOR THE STUDENT

1. It is important to maintain eyes out during the turn and not to fly on instruments. The angle of bank should be judged visually by using the attitude of the disc and the angle it cuts on the horizon backed up and confirmed by the roll indicator on the PFD.

2. Monitor the automation being used and ensure the aircraft is flying the expected flight profile.

3. Maintain lookout and SA whilst turning especially with regards to other aircraft

COMMON ERRORS

- Failure to maintain altitude.
- Failure to hold airspeed and heading.
- Causing slips and skids.
- Failure to maintain bank angle.
- Failure to roll out at desired heading.

ALTITUDE CHANGES CLIMBING AND DESCENDING

STANDARDS

- Airspeed: (Vy) 80 Kt ± 5 Kt.
- Heading: ± 5 º
- Transition to Level Flight: ±50 Feet

DEFINITION

1. This exercise will consolidate the flying controls co-ordination required in order to achieve a desired flight path and altitude changes. The exercises covered are flown both with and without holds engaged, providing an ideal opportunity to consolidate on previously taught techniques.

2. There are various techniques to climb and descend, the two you will cover are:

a. Standard Climb and Descent. The standard climb is most commonly used when a higher ROC/D is required or on an initial climb out from an airfield. It is conducted at 80 KIAS (Vy) which will give the greatest power margin.

b. Cruise Climb and Descent. The cruise climb is best described as a maneuver where the aircraft is flown at a specified ROC/ROD maintaining cruise speed, particularly useful when instrument flying.

NORMAL CLIMB

The entry into a climb from a hover has already been described in the Normal Takeoff from a Hover subsection; therefore, this discussion is limited to a climb entry from cruising flight.

NORMAL DESCENT

A normal descent is a maneuver in which the helicopter loses altitude at a controlled rate in a controlled attitude.

TECHNIQUE

CARRY OUT ALTITUDE CHANGES CONDUCTING A STANDARD CLIMB AND DESCENT WITHOUT FLIGHT DIRECTOR WHILST MAINTAINING HEADING

1. During this exercise you will practice the standard climb configuration which will be performed at Vy (80 KIAS) and 1000ft/min rate of climb.

The sequence for entering and levelling off from the climb can be remembered by the mnemonic T-APT: Trim - Attitude, Power, Trim.

2. Initiate the Climb. Start the exercise from cruise flight at 120 KIAS. Trim the cyclic with either the beep trim or the FTR to a decelerative attitude towards a speed reduction of 80 KIAS. Engage the FTR on the collective and increase the power to obtain 1000ft/min rate of climb. Anticipate 80 KIAS during the climb and adjust the cyclic to maintain a speed stable attitude. During the initial deceleration to 80 KIAS with a 20% increase in power ROC may well be a lot higher than 1000ft/min.

3. Level Off from the Climb. Anticipate the level off by 10% of the rate of climb. At this height, using the mnemonic T-APT: Trim - Attitude, Power, Trim, trim the cyclic to an accelerative attitude by either using the beep trim or FTR. As the rate of climb reduces and the airspeed increases, check the heading and balance. As the airspeed approaches 120 KIAS readjust the pitch with cyclic to a speed stable attitude, lower the collective to select cruise power and release the FT.

CARRY OUT ALTITUDE CHANGES CONDUCTING A CRUISE CLIMB AND DESCENT WITHOUT USE OF THE FLIGHT DIRECTOR, MAINTAINING SPEED AND HEADING

1. Before carrying out a cruise climb, maintain a good lookout to check the area is clear (lookout turns will allow a check behind and reduce any cockpit blind spots). Attitude throughout the maneuver will be maintained by the ATT function but small adjustments may be required in order to maintain exact speed by the use of the cyclic beep trim. Engage the collective trim and adjust power (monitor PI) to achieve the desired ROC, normally 1000ft/min, and trim. With ATT engaged, aircraft balance will be maintained following collective application but small adjustments to heading may be required using the cyclic trim. Re-adjust the aircraft attitude as you apply power if required. Ensure the aircraft is trimmed correctly and in balance throughout. Continue the lookout during the climb and anticipate the level off by 10% of the ROC. Level off at the required altitude by engaging the FTR on the collective and adjusting accordingly in order to achieve zero VSI. Allow datum's to settle prior to carrying out fine adjustments of attitude with cyclic beep trim.

2. As for the cruise climb, conduct a good lookout before commencing the descent maneuver. Attitude will be maintained by the ATT function. Engage the collective trim and adjust power to achieve the desired ROD, normally 750ft/min, and trim. With ATT engaged balance will be maintained following collective application but heading may require pilot input. Re-adjust the aircraft attitude as you reduce power if required. Ensure the aircraft is correctly trimmed and in balance throughout. Continue your lookout during the descent and anticipate the level off by 10% of the ROD. Level off at the required altitude by engaging the FTR on the collective and adjusting power back to cruise power to achieve zero VSI. Allow datum's to settle prior to carrying out fine adjustments of attitude with cyclic beep trim.

CARRY OUT ALTITUDE CHANGES USING VARIOUS METHODS WITH THE FLIGHT DIRECTOR MAINTAINING SPEED AND HEADING

1. The Upper Modes are engaged on the Guidance Control panel. For changes in Altitude the following can be used and will be covered:

a. ALT. The "ALT" mode allows the pilot to acquire and hold a BARO corrected altitude reference and can be used to adjust the altitude of the aircraft. ALTA

b. ALTA The "ALTA" mode allows the pilot to acquire a pre-selected barometric altitude (defined as target altitude) between -1000ft and 20000ft.

c. VS. The VS mode allows the pilot to capture and hold an inertial vertical speed reference between -1500ft/min (descent) and 2000ft/min (climb).

2. ALT. Engage ALT on the Guidance control Panel, ALT will be displayed at the top of the PFD and the magenta bug will appear on the altitude tape synchronizing at the current altitude. The altitude can now adjusted with the beep trim on the collective, moving it fore and aft. The magenta bug will move and a digital readout will be displayed to show the selected altitude.

a. When changing the ALT with the collective beep trim, the aircraft attitude may need to be adjusted to maintain the airspeed; this should be done with fine adjustment of the cyclic beep trim.

b. Remember that turn co-ordination is active automatically so the aircraft balance should be maintained.

c. By pushing the ALT on the RIC it will synchronize and reset the magenta bug to the current altitude.

3. ALTA. Selection of the target altitude is achieved by rotating the ALT knob on the Remote Instrument Control panel. The target altitude is then displayed on the PFD. The mode can be engaged/disengaged pressing ALTA on the Guidance Control panel. When it is engaged, ALTA will be displayed in green at the top of the PFD. A magenta bug will appear on the altitude tape along with a magenta digital target altitude at the top of the altitude tape and a magenta target rate of climb on top the vertical speed tape. The defaults are: 1000fpm in the climb and 750fpm in the descent.

a. If a different vertical speed is required, the vertical speed reference can be modified using the collective beep trim (DN or UP).

b. The vertical speed reference can also be modified by pushing the collective FTR that releases the collective trim actuator and synchronizes the position reference of the collective control with the current VS reference

4. VS. VS mode can be engaged/disengaged pressing the “VS” button on the Guidance Control panel. When the mode is engaged, VS will be displayed on the Mode Annunciator display at the top of the PFD and the vertical speed will be displayed as a magenta digital readout at the top of the vertical speed tape where it will be accompanied by an arrow pointing up or down to indicate a rate of climb or descent

a. The target vertical speed will be represented as a magenta bug on the vertical speed tape itself.

b. The vertical speed reference can be modified using the collective TRIM (UP/DN positions) or pushing the collective FTR that releases the collective trim actuator and synchronizes the position reference of the collective control with the current “VS” reference

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout above and below.

b. Monitor engine instruments.

c. Monitor the automation being used.

d. CRM “Heads in” “Heads out calls”

NOTES FOR THE STUDENT

1. Identify the beep trim on the collective and keep your thumb on it. This will avoid the need to keep looking inside the cockpit to identify it. Focus can then be on the PFD bug to ensure correct altitude selection.

2. As always, when using automation the flight path of the aircraft must be monitored. This is especially important when using vertical modes to climb or descend.

3. Maintain lookout and SA (Situational Awareness) especially with regards to other traffic. Before carrying out any climbing and descending conduct a lookout above and below the aircraft a 90°lookout turn will allow a check behind and check any cockpit blind spots.

COMMON ERRORS

1. Failure to maintain proper power and airspeed.

2. Holding too much or too little antitorque pedal.

3. In the level-off, decreasing power before adjusting the nose to cruising attitude.

4. Failure to maintain Ground Track.

5. Failure to maintain constant angle of decent during training.

6. Failure to level-off the aircraft sufficiently, which results in recovery below the desired altitude.

7. Failure to adjust antitorque pedal pressures for changes in power.

TURNS WHILE CLIMBING OR DESCENDING

STANDARDS

- Airspeed: (Vy) 80Kt. ± 5 Kt.
- Roll out to level flight: ± 50 Feet / ± 5 º
- Heading: ± 5 º
- Bank Angle: 15 º ± 5 º
- Rate of descent and climb: ± 500 feet/min

TECHNIQUE

For training purposes, 500 feet of altitude and 180 degrees of direction changes are made during these maneuvers. The discussion on level turns is equally applicable to making turns while climbing or descending. The only difference is that the helicopter is in a climbing or descending attitude rather than that of level flight. If a simultaneous entry is desired, merely combine the techniques of both maneuvers— climb or descent entry and turn entry. When recovering from a climbing or descending turn, the desired heading and altitude are rarely reached at the same time. If the heading is reached first, stop the turn and maintain the climb or descent until reaching the desired altitude. On the other hand, if the altitude is reached first, establish the level flight attitude, and continue the turn to the desired heading.

COMMON ERRORS

- Failure to do the Descent/Climb simultaneously with the turn.
- Not being able to adjust the Descent/Climb power.
- Inability to maintain bank angle and airspeed.

VERTICAL TAKEOFF TO A HOVER

STANDARDS

- Heading: ± 10 º
- Hover Height: 3 feet AGL ± 1 feet
- Drifting: 1 foot

DEFINITION

1. The area should be obstruction free and, for this exercise, the surface should be as level as possible. You will be expected to carry out the normal checks of fuel and engine instruments, and also the before takeoff and after takeoff. During a series of takeoffs and landings checks may be verbalized as “no change”, provided no switches or services have been altered.
2. Throughout the takeoff sequence, use the external hover references and do not be tempted to look at the ground immediately in front of the aircraft.
3. The control actions to achieve a stable hover are the same as for other aircraft types. To ensure maximum benefit is made of SAS and ATT hold to assist in aircraft stability, the correct use of the FTR is essential.

TECHNIQUE

The pilot on the controls needs to clear the area left, right, and above to perform a vertical takeoff to a hover. The pilot should remain focused outside the aircraft and obtain clearance to take off from the controlling tower. If necessary, the pilot who is not on the controls assists in clearing the aircraft and provides adequate warning of any obstacles and any unannounced or unusual drift/altitude changes.

Heading control, direction of turn, and rate of turn at hover are all controlled by using the pedals. Hover height, rate of ascent, and the rate of descent are controlled by using the collective. Helicopter position and the direction of travel are controlled by the cyclic.

TAKE OFF VERTICALLY AND ESTABLISH THE HOVER

1. The 139 hovers with a pronounced nose-up attitude of about 7° or 8° (depending of C of G) and a little left wheel low, into wind. When lifting into the hover anticipate the nose-wheel coming off the ground quite a bit before the main wheels, with the right a little ahead of the left.
2. Before takeoff, ensure the Nose Wheel is aligned forward and that the Nose Wheel lock is on, that the immediate vicinity is clear and that it is safe to take off.
3. Engage the FTR on the collective, cyclic and pedals look well ahead of the aircraft and then begin to raise the collective lever gently. As the aircraft becomes 'light on the wheels', correct any tendency for the aircraft to yaw (pedals) or slide (cyclic). As the aircraft begins to lift off (nose-wheel first) the cyclic will now need to be moved a little forward to select the hover attitude. Continue to maintain heading with the pedals.
4. It is important to raise the collective lever smoothly to ensure that the aircraft makes a clean break with the surface and to continue to raise until the correct hover height is reached. This should be 5ft, judged both primarily visually but with a glance at the Rad Alt display on the bottom right of the PFD from time to time. (see below)
5. Use normal smooth, gentle movements to stabilize the hover, release the FTR on the pedals and collective and when steady and carry out Hover Checks
   a. Engine parameters: Confirm within limits.
   b. Transmission parameters: Confirm within limits. (Note TQ)
   c. CAS Clear.
   d. NF / NR: Confirm NF/NR 100%.

TAKE-OFF OUT OF WIND

1. It may not be always possible to take-off into wind. For example, positioning the aircraft for a landing on an acceptable degree of slope may well involve heading the aircraft out of wind, which will alter the hover attitude.
2. The Take-Off. This is similar to a normal take-off but you will have to take into account the effect that the wind will have on the aircraft once it leaves the ground.
   a. Crosswind Take-Off. As per normal takeoff but, raise the collective lever slowly and at the same time position the cyclic towards the wind. As the aircraft lifts adjust the cyclic to maintain a steady hover over the takeoff point. There will be a need to displace the cyclic into wind.
   b. Downwind Take-Off. From the downwind position the technique differs in that the collective lever is raised slightly before the cyclic is offset into wind. This is for tail clearance during the transition to the hover.
3. As the collective lever is lowered to the fully down position. The pedals may become quite sensitive in gusty conditions and care must be taken to avoid over-controlling and perhaps, in extreme cases, over-torqueing.
   a. Downwind Landing. The technique required is much the same as for the crosswind case. The pedals can be extremely sensitive and, once again it is possible to over-torque as a result of harsh pedal inputs.

AIRMANSHIP

1. The main airmanship points of this exercise are:
   a. Maintain a good lookout for fixed obstacles, other aircraft and vehicles
   b. Monitor engine instruments, PI and fuel contents.
   c. Avoid hovering over uneven or sloping ground, or above normal height. In both cases more power (PI) be required, and the chances of carrying out a safe SE landing in the event of a failure will be reduced.
   d. Monitor wind velocity.
   e. Loss of tail rotor authority - smooth and careful use of pedals and collective lever, particularly with strong crosswinds, to reduce risk of loss of tail rotor authority.
   f. Awareness of Ground Clearance.
   g. Checks.

NOTES FOR THE STUDENT

1. Smooth and gentle control inputs are required throughout these maneuvers. However, if you find that you are over-controlling especially with the collective, simply set a sensible PI figure and release the collective FT, this should allow the aircraft to settle.
2. When conducting the maneuvers try not to focus on markers too close to the aircraft in order to maintain the hover position.

The risks associated with Takeoffs and Landings are:

a. Ground Resonance. Incorrect tyre pressures (especially if the aircraft is rolling on its wheels) can lead to a quick onset of ground resonance. Apply the appropriate technique of immediate takeoff or shutdown if encountered.

b. Dynamic Rollover. Be aware of dynamic rollover on slopes, during taxiing and even during operations on flat ground. Any lateral drift during touchdown can cause this problem if a reject is performed i.e. the aircraft if lifted too quickly back into the hover. Furthermore, a fully compressed tyre contains an amount of Potential Energy. If that energy is released too quickly, especially when complementary to other forces, such as tail rotor thrust and the horizontal component of main rotor thrust (i.e. rotating about the right wheel with too much cyclic) then dynamic rollover can occur.

c. Tail Strike. With such a significant nose-up hover attitude, the risk of a tail-strike is ever present. Keep in mind that the lower side of the tail-boom is almost parallel to the ground in the hover.

COMMON ERRORS

1. Failing to ascend vertically as the helicopter becomes airborne.
2. Pulling excessive collective to become airborne, causing the helicopter to gain too much altitude.
3. Overcontrolling the antitorque pedals, which not only changes the heading of the helicopter, but also changes the rpm.
4. Reducing throttle rapidly in situations in which proper rpm has been exceeded, usually resulting in exaggerated heading changes and loss of lift, resulting in loss of altitude.
5. Failing to ascend slowly.

HOVERING

Hovering is a maneuver in which the helicopter is maintained in nearly motionless flight over a reference point at a constant altitude and on a constant heading.

TECHNIQUE

To maintain a hover over a point, use sideview and peripheral vision to look for small changes in the helicopter's attitude and altitude. When these changes are noted, make the necessary control inputs before the helicopter starts to move from the point. To detect small variations in altitude or position, the main area of visual attention needs to be some distance from the aircraft, using various points on the helicopter or the tip-path plane as a reference. Looking too closely or looking down leads to overcontrolling. Obviously, in order to remain over a certain point, know where the point is, but do not focus all attention there.

As with a takeoff, the pilot controls altitude with the collective and maintains a constant rpm with the throttle. The cyclic is used to maintain the helicopter's position; the pedals, to control heading. To maintain the helicopter in a stabilized hover, make small, smooth, coordinated corrections. As the desired effect occurs, remove the correction in order to stop the helicopter's movement. For example, if the helicopter begins to move rearward, apply a small amount of forward cyclic pressure. However, neutralize this pressure just before the helicopter comes to a stop, or it will begin to move forward.

After experience is gained, a pilot develops a certain "feel" for the helicopter. Small deviations can be felt and seen, so you can make the corrections before the helicopter actually moves. A certain relaxed looseness develops, and controlling the helicopter becomes second nature, rather than a mechanical response.

COMMON ERRORS

1. Tenseness and slow reactions to movements of the helicopter.
2. Failure to allow for lag in cyclic and collective pitch, which leads to overcontrolling. It is very common for a student to get ahead of the helicopter. Due to inertia, it requires some small time period for the helicopter to respond.
3. Confusing attitude changes for altitude changes, which results in improper use of the controls.
4. Hovering too high, creating a hazardous flight condition. The height velocity chart should be referenced to determine the maximum skid height to hover and safely recover the helicopter should a malfunction occur.
5. Hovering too low, resulting in occasional touchdown.
6. Becoming overly confident over prepared surfaces when taking off to a hover. Be aware that dynamic

rollover accidents usually occur over a level surface.

LANDING FROM HOVERING

STANDARDS

- Hover Height: 5 feet AGL
- Heading: ± 10 º
- Drifting Forward: 1 foot
- Drifting sideways and backwards is not allowed.

DEFINITION

Once the initials are established, from a 3 feet fixed hover state, the collective is gently pressed down to establish a smooth and sustained rate of descent. Considering the reference line passing through two selected points 50 – 75 feet ahead of the helicopter, the initial deviations are prevented by small pedal controls, and the drifting and forward and backward movements of the fuselage are prevented by small cyclic controls.

Do not look directly in front of the helicopter in order to avoid mistakes and therefore excessive control applications. A decreasing trend in approaching ground can be felt due to the ground effect about 1 foot from the ground. In this case, the collective is continued to be decreased so that the initial rate of descent is achieved. It should be noted that first the left/right skid (wheel) and then the right/left skid (wheel) will touch the ground, since the helicopter body is tilted to the left/right on the hover. While the skids/wheels are touching the ground, all movements of the helicopter are prevented by cyclic and pedals, and the collective is pressed down softly.

Carry out the Before Landing Checks and clear all around and beneath the aircraft, confirm that the surface is suitable. From a steady hover engage the FTR on the collective and cyclic, lower the collective to begin a smooth descent, maintaining ground position with the cyclic and aircraft heading with the pedals (heading hold is active providing ATT is on). Expect the aircraft to land left wheel first under normal loading conditions when into wind. As with the takeoff, it is important to correct for any drift early, there must be no lateral drift upon touchdown.

As the aircraft wheels come into contact with the ground, continue to lower the collective adjusting pedals to maintain aircraft heading. Brakes should be applied if the collective is to be lowered fully. unless taxiing is desired, in which case maintain some power to control the aircraft. Once the collective is fully down, carry out the After Landing Checks

COMMON ERRORS

- Sudden decreasing or intermittent use of the collective,
- Allowing deviations and drifts,
- Too much and unnecessary playing with the controllers.

HOVERING—FORWARD FLIGHT, TAXI

STANDARDS

- Heading ± 10 º
- Hover Height: 5 feet AGL feet ± 1 feet
- Drifting: ± 1 feet

DEFINITION

Forward hovering flight is normally used to move a helicopter to a specific location, and it may begin from a stationary hover. During the maneuver, constant groundspeed, altitude, and heading should be maintained.

Ground taxiing may be necessary for safe operation of the aircraft and the safety of those on the ground around it. This may be particularly desirable when parking close to buildings, ground equipment, vehicles and other aircraft.

TAXIING

Taxiing refers to operations on or near the surface of taxiways or other prescribed routes. Helicopters utilize three different types of taxiing.

TECHNIQUE

Before starting, pick out two references directly in front and in line with the helicopter. These reference points should be kept in line throughout the maneuver. Begin the maneuver from a normal hovering altitude by applying forward pressure on the cyclic. As movement begins, return the cyclic toward the neutral position to maintain low groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain a constant groundspeed and path over the ground with the cyclic, a constant heading with the antitorque pedals, altitude with the collective, and the proper rpm with the throttle.

To stop the forward movement, apply rearward cyclic pressure until the helicopter stops. As forward motion stops, return the cyclic to the neutral position to prevent rearward movement. Forward movement can also be stopped by simply applying rearward pressure to level the helicopter and allowing it to drift to a stop.

1.HOVER TAXI

A hover taxi is used when operating below 25 feet above ground level (AGL). Since hover taxi is just like forward, sideward, or rearward hovering flight, the technique to perform it is not presented here.

In the hover-taxi cyclic stick is used to control the groundspeed, the collective lever is used to control height and the pedals are used to point the aircraft in the required direction of travel. Remember that all controls can be trimmed.

From a steady 3ft hover, engage the FTR on the cyclic and select a slightly accelerative attitude and move forward, adjusting ground speed to a fast-walking pace. Note the speed vector on the MFD, and the GS readout (see below). Maintain the height by engaging the FTR on the collective and adjust to avoid any sink and trim the pedals to maintain the direction of travel. HDG is automatically maintained when airspeed is below 40 kts. It is important to eliminate lateral drift in case it becomes necessary to carry out a run-on landing.

The aircraft can be trimmed to the hover taxi making small adjustments against the spring pressure to maintain the desired height, speed and direction or the FTR can be engaged, and the aircraft can be hover taxied un-stabilized.

In cross wind conditions, cross controlling of cyclic and pedals is required to ensure that the wheels are pointing in the direction of movement, maintaining height with collective.

To re-establish the hover, maintaining heading and height and use the beep trim on the cyclic is to bring the speed vector back to the central position and allow the aircraft to drift to a halt.

2.AIR TAXI

An air taxi is preferred when movements require greater distances within an airport or heliport boundary. In this case, fly to the new location; however, it is expected that the helicopter will remain below 100 feet AGL with an appropriate airspeed and will avoid over flight of other aircraft, vehicles, and personnel.

TECHNIQUE

Before starting, determine the appropriate airspeed and altitude combination to remain out of the cross-hatched or shaded areas of the height-velocity diagram. Additionally, be aware of crosswind conditions that could lead to loss of tail rotor effectiveness. Pick out two references directly in front of the helicopter for the ground path desired. These reference points should be kept in line throughout the maneuver.

Begin the maneuver from a normal hovering altitude by applying forward pressure on the cyclic. As movement begins, attain the desired airspeed with the cyclic. Control the desired altitude with the collective and rpm with the throttle. Throughout the maneuver, maintain a desired groundspeed and ground track with the cyclic, a constant heading with antitorque pedals, the desired altitude with the collective, and proper operating rpm with the throttle.

To stop the forward movement, apply aft cyclic pressure to reduce forward speed. Simultaneously lower the collective to initiate a descent to hover altitude. As forward motion stops, return the cyclic to the neutral position to prevent rearward movement. As approaching the proper hover altitude, increase the collective as necessary to stop descent at hover altitude (much like a quick stop maneuver).

COMMON ERRORS

1. Erratic movement of the cyclic, resulting in improper airspeed control and erratic movement over the surface.

2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired altitude.
4. Failure to maintain proper rpm.
5. Overflying parked aircraft causing possible damage from rotor downwash.
6. Flying in the cross-hatched or shaded area of the height-velocity diagram.
7. Flying in a crosswind that could lead to loss of tail rotor effectiveness.
8. Excessive tail-low attitudes.
9. Excessive power used or required to stop.
10. Failure to maintain alignment with direction of travel.

CARRY OUT GROUND TAXI STRAIGHT AHEAD

1. Before beginning to ground taxi ensure that the area is suitable, clear of hazards and obstructions. The Before Taxi/Take-Off Checks are then carried out:

GROUND TAXIING

Nose wheel lock: OFF.

Collective and cyclic: Increase collective slowly and move the cyclic stick gently forward to start movement.

Pedal brakes: Check operation.

Pedals: As required, to select direction.

Collective and pedal brakes: To reduce speed and stop, lower the collective and apply pedal brakes.

2. To check the operation of the brakes you will need to remove your feet from the floor and apply equal pressure to the toe brakes on top of the yaw pedals ,(see graphic above). Call “braking” so the PNF and any passengers are aware of the aircraft coming to a stop. It is important that the cyclic and collective positions are maintained while the brake check is conducted otherwise you may not be checking that the brakes are working and may be helping the aircraft to stop with the controls.

3. Raise the collective to increase PI by 5-10% and trim the pedals as necessary to maintain a level fuselage attitude. The actual PI required will vary with aircraft AUM and the surface/slope over which the aircraft is moving.

4. If you do not initially apply enough power and therefore not enough pitch on the blades, you will need to apply more forward cyclic. This, however, can bring the blades down against the droop stops. Repeated mishandling like this can cause damage.

5. Once the aircraft has started moving forward re-center the cyclic to the central position using the markers on the PFD (see graphic). Under the guidance of your instructor at this early stage, it may be appropriate to move the cyclic a small amount to compensate for crosswind. Control the speed with collective and trim with the pedals as necessary.

6. While taxiing, ground speed can be monitored on the PFD in the GS display at the bottom of the airspeed tape.

STOP THE AIRCRAFT FROM A GROUND TAXI

1. To reduce speed and stop, lower the collective and apply pedal brakes. Do not use aft cyclic to slow the aircraft. See previous page about mishandling causing damage.

2. Ensure the cyclic is central.

3. Apply the parking brake.

CARRY OUT MANOEUVRING WHILST GROUND TAXIING

1. In order to maneuver the aircraft in any direction other than forwards the **Nose Wheel must be unlocked.** A positive lookout must be maintained whilst maneuvering, paying particular attention to tail clearance from obstacles during turns.

2. Engage the FTR on the pedals (see below) and use left and right pedal inputs to turn the aircraft with some lateral cyclic into the turn to maintain a level fuselage attitude.

3. When maneuvering announce "tail clear L/R, nose clear L/R"

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout. Confirm tail/nose clearance prior to maneuvers.

b. Positive division of responsibility between the crew (i.e. to ensure that both are not looking 'Inside' at the same time).

c. Announcement of actions by the PF, e.g., "BRAKING"

d. Awareness of wind velocity (max crosswind/downwind taxi limits).

e. Awareness of taxi speed (max speed limits) and turn radius.

f. Awareness of the ground surface conditions.

g. Awareness of brake status.

h. Awareness of Nose Wheel status.

i. Awareness of Parking Brake status.

j. Actions in the event of ground resonance.

NOTES FOR THE STUDENT

1. Ensure that you identify and that you are aware of the location of the pedal trims. The correct foot position to taxi comfortably is with your heels on the floor and toes resting lightly on the pedals. When you need to trim, apply pressure to the pedals, adjust pedal position as required then release foot pressure - this will trim the new pedal position.

2. It is easier to conduct the brake check with your harness in the locked position.

3. Generally, the cyclic should be kept centered. However, if there are conditions of significant wind the cyclic may have to be moved laterally into wind just a little to keep the aircraft in a level attitude.

4. If the ground taxi has begun with the Nose Wheel Lock inadvertently left in the LOCKED position, it is important to remember the correct sequence of actions – stop the aircraft, lower the collective completely, center the pedals and only then UNLOCK the nose wheel.

5. After stopping apply the nose wheel lock and the parking brake if required.

6. Be aware of the possibility of ground resonance following collective application and be ready to take corrective action as necessary – lift the helicopter free of the ground immediately or, if unable, to become airborne, lower collective and shut off engines immediately.

7. Note that while the Simulator may feel a little different in ground taxying, the skills taught and learned remain the same.

COMMON ERRORS

1. Exaggerated movement of the cyclic, resulting in erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain alignment with direction of travel.

HOVERING TURN

STANDARDS

- Hover Height: 5 feet AGL ± 1 feet
- Rate of Turn: 90 ° turn in 4 second.
- Drifting: 1 foot

DEFINITION

A hovering turn is a maneuver performed at hovering altitude in which the nose of the helicopter is rotated either left or right while maintaining position over a reference point on the surface. Hovering turns can also be made around the mast or tail of the aircraft. The maneuver requires the coordination of all flight controls and demands precise control near the surface. A pilot should maintain a constant altitude, rate of turn, and rpm. (4 sec for a 90 degree turn)

1. This exercise is intended to familiarize the pilot with the characteristics of the AW139. As with all hover or hover-related exercises, proximity to the ground and surrounding obstacles demands a high degree of flying accuracy. The trim system must be used correctly to control the aircraft properly and to stay within the exercise parameters.

2. Spot turns are carried out using the conventional technique of pedal to control rate of turn, cyclic to maintain the turn about a datum point and collective to maintain height. Turns will be conducted about the mast of the aircraft. Be alert to the effect of pedal application upon torque (PI), particularly at high AUM. Where possible turns should be made to the left, confirming sufficient power is available and reducing the risk of an over-torque if having to arrest a high rate of turn with opposite pedal

TECHNIQUE

Initiate the turn in either direction by applying anti-torque pedal pressure toward the desired direction. It should be noted that during a turn to the left, more power is required because left pedal pressure increases the pitch angle of the tail rotor, which, in turn, requires additional power from the engine. A turn to the right requires less power. (On helicopters with a clockwise rotating main rotor, right pedal increases the pitch angle and, therefore, requires more power.)

As the turn begins, use the cyclic as necessary (usually into the wind) to keep the helicopter over the desired spot. To continue the turn, add more pedal pressure as the helicopter turns to the crosswind position. This is because the wind is striking the tail surface and tail rotor area, making it more difficult for the tail to turn into the wind. As pedal pressures increase due to crosswind forces, increase the cyclic pressure into the wind to maintain position. Use the collective with the throttle to maintain a constant altitude and rpm.

After the 90° portion of the turn, decrease pedal pressure slightly to maintain the same rate of turn. Approaching the 180°, or downwind portion, anticipate opposite pedal pressure due to the tail moving from an upwind position to a downwind position. At this point, the rate of turn has a tendency to increase at a rapid rate due to the tendency of the tail surfaces to weathervane. Because of the tailwind condition, hold rearward cyclic pressure to keep the helicopter over the same spot.

The horizontal stabilizer has a tendency to lift the tail during a tailwind condition. This is the most difficult portion of the hovering turn. Horizontal and vertical stabilizers have several different designs and locations, including the canted stabilizers used on some Hughes and Schweizer helicopters. The primary purpose of the vertical stabilizer is to unload the work of the antitorque system and to aid in trimming the helicopter in flight should the antitorque system fail. The horizontal stabilizer provides for a more usable CG range and aids in trimming the helicopter longitudinally.

Because of the helicopter’s tendency to weathervane, maintaining the same rate of turn from the 180° position actually requires some pedal pressure opposite the direction of turn. If a pilot does not apply opposite pedal pressure, the helicopter tends to turn at a faster rate. The amount of pedal pressure and cyclic deflection throughout the turn depends on the wind velocity. As the turn is finished on the upwind heading, apply opposite pedal pressure to stop the turn. Gradually apply forward cyclic pressure to keep the helicopter from drifting.

Control pressures and direction of application change continuously throughout the turn. The most dramatic change is the pedal pressure (and corresponding power requirement) necessary to control the rate of turn as the helicopter moves through the downwind portion of the maneuver.

Turns can be made in either direction; however, in a high wind condition, the tail rotor may not be able to produce enough thrust, which means the pilot cannot control a turn to the right in a counterclockwise rotor system. Therefore, if control is ever questionable, first attempt to make a 90° turn to the left. If sufficient tail rotor thrust exists to turn the helicopter crosswind in a left turn, a right turn can be successfully controlled. The opposite applies to helicopters with clockwise rotor systems. In this case, start the turn to the right. Hovering turns should be avoided in winds strong enough to preclude sufficient aft cyclic control to maintain the helicopter on the selected surface reference point when headed downwind. Check the flight manual for the manufacturer’s recommendations for this limitation.

CARRY OUT SPOT TURNS

1. The aircraft will be taxied to or hover taxied to a suitable area (some areas require a ground taxi), after reaching a "Training Square" position the aircraft in the center, into wind and land.

2. Although the Flight Director Upper Modes will not be selected on the Guidance Control Panel, it is important to note that the heading hold is automatically activated in the hover and will remain engaged as long as the FT is not released. With feet off the pedals, you will note that the heading remains constant while the aircraft climbs, descends or moves laterally. However, activation of the FTR will interrupt the heading hold datum.

3. Lift the aircraft to a 5ft hover. To start a slow rotation, engage the FTR on the pedals and conduct a 360° turn in each direction maintaining center position in the training square then land. Failing to engage the FTR on the pedals will result in the aircraft yawing back to the trimmed pedal heading. The heading bug will remain on the pre-selected heading if the pedal FT is not engaged during the maneuver.

CARRY OUT SPOT TURNS WITH THE USE OF HOVER MODE

1. The Spot / Lookout Turn. Engage the HOV mode by either 5th axis on the cyclic or the HOV button on the Guidance Control Panel. The symbology will change to the HOV HSI display on the PFD, displaying the speed circles, speed vectors and heading bug. Height must be above 30ft RAD height to allow engagement of the HOV mode. If you engage HOV and are above 30ft adjust the height back down to 30ft using the beep trim (in the aft direction) on the collective for safety i.e. in case of a single engine failure. Turn using the collective beep trim and note the heading bug movement. Stop the turn on desired heading.

The heading and therefore the spot turn can also be conducted by turning the HDG bug on the Remote Instrument Controller (RIC). This technique is not recommended in the hover as it requires taking one hand off the primary flight controls.

a. If whilst turning the pedal trims are engaged it synchronizes the heading bug to the current aircraft heading.

b. The same applies when the HDG button is pushed on the RIC.

COMMON ERRORS

1. Failing to maintain a slow, constant rate of turn.

2. Failing to maintain position over the reference point.

3. Failing to maintain rpm within normal range.

4. Failing to maintain constant altitude.

5. Failing to use the antitorque pedals properly.

HOVERING—SIDEWARD FLIGHT

STANDARDS

- Heading: ± 10 º
- Hover Height: 5 feet AGL ± 1 feet
- Drifting Rearward: ± 2 feet

DEFINITION

Sideward hovering flight may be necessary to move the helicopter to a specific area when conditions make it impossible to use forward flight. During the maneuver, a constant groundspeed, altitude, and heading should be maintained.

1. This exercise is intended to familiarize the pilot with the characteristics of the AW139. As with all hover or hover-related exercises, proximity to the ground and surrounding obstacles demands a high degree of flying accuracy. The trim system must be used correctly to control the aircraft properly and to stay within the exercise parameters.

2. Sideways and backwards flight should only be used for short durations when a normal hover taxi in the direction of travel is not appropriate. Limitations associated with the Low-Speed Flight Envelope can be found in the RFM. The exercise will be practiced at low speed (hover taxi). During these maneuvers, especially if

speed becomes too high, harsh left pedal inputs can result in large torque spikes beyond aircraft transmission limitations.

TECHNIQUE

Before starting sideward hovering flight, ensure the area for the hover is clear, especially at the tail rotor. Constantly monitor hover height and tail rotor clearance during all hovering maneuvers to prevent dynamic rollover or tail rotor strikes to the ground. Then, pick two points of in-line reference in the direction of sideward hovering flight to help maintain the proper ground track. These reference points should be kept in line throughout the maneuver.

Begin the maneuver from a normal hovering altitude by applying cyclic toward the side in which the movement is desired. As the movement begins, return the cyclic toward the neutral position to maintain low groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain a constant groundspeed and ground track with cyclic. Maintain heading, which in this maneuver is perpendicular to the ground track, with the antitorque pedals, and a constant altitude with the collective. Use the throttle to maintain the proper operating rpm. Be aware that the nose tends to weathervane into the wind. Changes in the pedal position will change the rpm and must be corrected by collective and/or throttle changes to maintain altitude.

To stop the sideward movement, apply cyclic pressure in the direction opposite to that of movement and hold it until the helicopter stops. As motion stops, return the cyclic to the neutral position to prevent movement in the opposite direction. Applying sufficient opposite cyclic pressure to level the helicopter may also stop sideward movement. The helicopter then drifts to a stop.

PERFORM SIDEWAYS MOVEMENT

1. Lift the aircraft again into a 5ft hover and perform a complete square at a constant heading (into wind). Forward to the edge of the square, then right to the corner, backward to the rear corner, sideways to the left corner, forward to the upper corner, then right and back to the center and land.

2. Low speed sideways and rearwards flight is carried out as follows

Sideways. Lookout and confirm the area planned to be move into is clear of obstacles. Displace the cyclic against spring pressure in the required direction of travel. As the aircraft accelerates laterally, maintain height with collective (engage the FTR) and heading with pedals. External cues will provide primary reference information, but reference may also be made to RAD ALT readout and GS display. Control speed with cyclic and monitor PI. To return to the hover relax the pressure on the cyclic and the aircraft will reselect the hover attitude and, once in the hover, will trim. Using the beep trim to maneuver sideways is also an option (try both techniques).

PERFORM SIDEWAYS MOVEMENT WITH THE USE OF FD MODES

1. The HOV mode is used for this maneuver and the main reference for velocity and direction is the Hover HSI display on the PFD.

2. Using the beep trim on the cyclic, the aircraft can be maneuvered forwards, backwards and sideways to the left or right. The beep trim on the collective will move the aircraft up or down or yaw to the left or right. The speed vector will show the trend and the magenta circle will display the direction selection. Groundspeed (GS) will be displayed below the IAS tape on the PFD. Note that this is GS in any direction but does not indicate in which direction – e.g., backwards.

3. Practice maneuvering the aircraft as per the sideways and backwards exercise using the collective beep trim.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout and situational awareness.

b. Monitoring: Wind velocity and Torque.

c. Ground Clearance.

d. Checks.

NOTES FOR THE STUDENT

1. Take care not to over control during this maneuver. It is easy to “pump” the collective when the FTR is engaged. If this happens release the FT and come to the hover.

2. Try to visually judge the correct height by either using the backdrop technique or by focusing on something well ahead of the aircraft.

3. Maintain good lookout at all times for obstructions or other aircraft.

4. When using the automation it is important at all times to have an awareness of the state of the intended or projected flight profile.

COMMON ERRORS

1. Exaggerated movement of the cyclic, resulting in overcontrolling and erratic movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to make sure the area is clear prior to starting

HOVERING—REARWARD FLIGHT

STANDARDS

- Heading: ± 10 °
- Hover Height: 10 feet AGL (± 1 feet)
- Drifting: 1 foot

DEFINITION

Rearward hovering flight may be necessary to move the helicopter to a specific area when the situation is such that forward or sideward hovering flight cannot be used. During the maneuver, maintain a constant groundspeed, altitude, and heading. Due to the limited visibility behind a helicopter, it is important that the area behind the helicopter be cleared before beginning the maneuver. Use of ground personnel is recommended.

1. This exercise is intended to familiarize the pilot with the characteristics of the AW139. As with all hover or hover-related exercises, proximity to the ground and surrounding obstacles demands a high degree of flying accuracy. The trim system must be used correctly to control the aircraft properly and to stay within the exercise parameters.

2. Sideways and backwards flight should only be used for short durations when a normal hover taxi in the direction of travel is not appropriate. Limitations associated with the Low Speed Flight Envelope can be found in the RFM (see below). The exercise will be practiced at low speed (hover taxi). During these maneuvers, especially if speed becomes too high, harsh left pedal inputs can result in large torque spikes beyond aircraft transmission limitations.

TECHNIQUE

Before starting rearward hovering flight, pick out two reference points in front of, and in line with the helicopter just like hovering forward. The movement of the helicopter should be such that these points remain in line.

Begin the maneuver from a normal hovering altitude by applying rearward pressure on the cyclic. After the movement has begun, position the cyclic to maintain a slow groundspeed—no faster than a brisk walk. Throughout the maneuver, maintain constant groundspeed and ground track with the cyclic, a constant heading with the antitorque pedals, constant altitude with the collective, and the proper rpm with the throttle.

To stop the rearward movement, apply forward cyclic and hold it until the helicopter stops. As the motion stops, return the cyclic to the neutral position. Also, as in the case of forward and sideward hovering flight, opposite cyclic can be used to level the helicopter and let it drift to a stop. Tail rotor clearance must be maintained. Generally, a higher-than normal hover altitude is preferred.

PERFORM BACKWARDS MOVEMENT

1. Lift the aircraft again into a 5ft hover and perform a complete square at a constant heading (into wind). Forward to the edge of the square, then right to the corner, backward to the rear corner, sideways to the left corner, forward to the upper corner, then right and back to the center and land.

2. Low speed sideways and rearwards flight is carried out as follows

Backward. Maneuvering backwards should only be carried out over short distances, and only when turning and when hover taxiing forward is not appropriate. Having ensured that the area behind is clear increase the height to ensure adequate tail boom clearance. Then initiate movement with aft cyclic against spring pressure to achieve a slow walking pace. Maintain height with collective and heading with pedals. Use external cues, monitor parameters, control speed with cyclic and monitor PI. To return to the hover relax the pressure on the cyclic, reselect the hover attitude and re-trim in the hover.

PERFORM BACKWARDS MOVEMENT WITH THE USE OF FD MODES

1. The HOV mode is used for this maneuver and the main reference for velocity and direction is the Hover HSI display on the PFD.

2. Using the beep trim on the cyclic, the aircraft can be maneuvered forwards, backwards and sideways to the left or right. The beep trim on the collective will move the aircraft up or down or yaw to the left or right. The speed vector will show the trend and the magenta circle will display the direction selection. Groundspeed (GS) will be displayed below the IAS tape on the PFD. Note that this is GS in any direction but does not indicate in which direction – e.g., backwards.

3. Practice maneuvering the aircraft as per the sideways and backwards exercise using the collective beep trim.

AIRMANSHIP

1. The main airmanship points of this exercise are:
   a. Lookout and situational awareness.
   b. Monitoring: Wind velocity and Torque.
   c. Ground Clearance.
   d. Checks.

NOTES FOR THE STUDENT

1. Take care not to over control during this maneuver. It is easy to “pump” the collective when the FTR is engaged. If this happens release the FT and come to the hover.

2. Try to visually judge the correct height by either using the backdrop technique or by focusing on something well ahead of the aircraft.

3. Maintain good lookout at all times for obstructions or other aircraft.

4. When using the automation it is important at all times to have an awareness of the state of the intended or projected flight profile.

COMMON ERRORS

1. Exaggerated movement of the cyclic resulting in overcontrolling and an uneven movement over the surface.
2. Failure to use proper antitorque pedal control, resulting in excessive heading change.
3. Failure to maintain desired hovering altitude.
4. Failure to maintain proper rpm.
5. Failure to make sure the area is clear prior to starting the maneuver.

HOVER OGE (OUT OF GROUND EFFECT) CHECK

STANDARDS

- Drift: ±10 Ft.
- Establishing a hover altitude at 100 Feet or above surrounding obstacles.
- Heading: ±10°
- Maintaining a constant rate of turn when making a 360° left turn.
- Correctly aircraft limitations.
- Accurate determination of aircraft power and controllability for maneuvers requiring OGE HOVER power.

DEFINITION

An OGE Check can be performed at any time when there is a question mark about the control or power of the aircraft.

Altitude vertically to 100 feet or on top of surrounding obstacles, whichever is higher. The helicopter's engine instruments are constantly observed. The limits of the aircraft are not exceeded. A 360 degree left/right turn is made while continuously checking the power and control of the aircraft. The maneuver is finished at ground effect or at the desired height.

1. To have the ability to hover outside ground effect is a fundamental part of the function of a helicopter. It affords flexibility and can be used operationally in SAR, camera surveillance and covert operations at high

levels. It is an advanced maneuver and has the potential of danger if it is not monitored or if it is mishandled. Hovering OGE is defined as maintaining a constant height and heading over a given ground position.

2. Before conducting this maneuver you must be aware of the conditions in which Vortex Ring state (see refresher notes below)

3. Before flight and before conducting the maneuver ensure that the aircraft performance has been calculated with the use of the RFM and that you have a 10% power margin. This is needed to maintain the hover OGE and allow sufficient power to arrest any small ROD.

4. When conducting the hover OGE over land for training the aircraft is configured for landing.

TECHNIQUE

MAINTAIN A HOVER OUTSIDE GROUND EFFECT WITHOUT THE USE OF HOVER MODE

1. From 80 KIAS and at a height above 1000ft AGL start to decelerate the aircraft using either the cyclic beep trim or FTR (approx. 10° nose up). At the same time maintain altitude, monitor and confirm using the VSI. As the airspeed reduces to below 30 KIAS anticipate the loss of translational lift and apply power to 5% more than was required hovering IGE. By doing this it will ensure that a ROD doesn't occur that cannot be arrested.

2. As the speed reduces further it is important to monitor the ground speed (displayed on the PFD), because the IAS is inaccurate at low speeds. Picking external markers will make it easier to maintain a ground position and asses any sideways or backwards drift. As the ground speed reduces to 0kts monitor the VSI very closely. DO not allow a ROD to build up more than 500ft/min. (if it does then abort the hover, fly away and reset). The power required to hover OGE will be between 5-10% more than IGE (depending on wind and turbulence).

3. To maintain the hover trim all the controls and just make small adjustments with cyclic against spring pressure to maintain the ground position. The HDG hold will be active automatically so you can relax on the pedals and the aircraft heading will be maintained.

VORTEX RING

1. Below is a refresher on vortex ring.

   a. Requirements.

      i. Power applied.

      ii. High ROD > 500ft/min.

      iii. Low airspeed < 30 kts.

   b. Characteristics and indications of incipient vortex ring.

      i. Vibration.

      ii. Increased ROD without adjustment of the collective.

      iii. Cyclic unresponsive.

   c. Recovery action in the event of insipient or full vortex ring. (Take away one of the parameters). Preferably in this order.

      i. Lower the collective (if height permits) to MPOG.

      ii. Forward cyclic to gain forward speed above 30kts.

2. Once the aircraft is responding as normal regain the height and speed and fly away.

MAINTAIN A HOVER OUTSIDE GROUND EFFECT WITH THE USE OF HOLDS

1. Use the same technique as above but as the airspeed comes below 30 KIAS push the 5th axis of the cyclic beep trim to engage the HOV mode.

2. WARNING.

   a. When using the HOV Mode ensure that the ground underneath the aircraft is completely flat as the altitude maintained is RAD height (RHT if below 2500ft AGL). Any drift or movement of the aircraft over undulating terrain will cause the aircraft to climb or descend to try to maintain the height. This will move the collective abruptly and can put the aircraft into a vortex ring configuration.

   b. If there is any doubt about the terrain underneath then the RHT Mode can be disengaged, and the altitude maintained manually with the collective or ALT can be engaged enabling the aircraft to automatically maintain altitude from the BAR Alt.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.
b. Monitor fuel and engine instruments.
c. Monitor the wind velocity.
d. Choose a suitable area for recovery of vortex ring or aborted hover.
e. Carry out all the relevant checks.

NOTES FOR THE STUDENT

1. Pick markers to maintain ground position.
2. Remember that the displayed groundspeed is in any direction.
3. React promptly to any signs of high ROD or Vortex Ring.
4. Monitor the automation in use.
5. The HOGE is normally performed into wind for power and controllability reasons, however sometimes it is beneficial to put the wind slightly off the 12 O'clock position and "lean into" the wind for stability.

COMMON ERRORS

- Not being able to maintain high hover altitude.
- Inability to prevent drifts.

NORMAL TAKEOFF FROM A HOVER

STANDARDS

- Before Take Off Checks
- Hover Height: 10 feet AGL (± 1 feet)
- Cyclic acceleration: -10°± 1°
- Power Regulation: ± % 3
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

A normal takeoff from a hover is an orderly transition to forward flight and is executed to increase altitude safely and expeditiously. During the takeoff, fly a profile that avoids the cross-hatched or shaded areas of the height-velocity diagram.

TECHNIQUE

Bring the helicopter to a hover and make a performance check, which includes power, balance, and flight controls. The power check should include an evaluation of the amount of excess power available; that is, the difference between the power being used to hover and the power available at the existing altitude and temperature conditions. The balance condition of the helicopter is indicated by the position of the cyclic when maintaining a stationary hover. Wind necessitates some cyclic deflection, but there should not be an extreme deviation from neutral. Flight controls must move freely, and the helicopter should respond normally. Then, visually clear the surrounding area.

Start the helicopter moving by smoothly and slowly easing the cyclic forward (position 2). As the helicopter starts to move forward, increase the collective, as necessary, to prevent the helicopter from sinking and adjust the throttle to maintain rpm. The increase in power requires an increase in the proper antitorque pedal to maintain heading. Maintain a straight takeoff path throughout the takeoff.

While accelerating through effective translational lift, the helicopter begins to climb, and the nose tends to rise due to increased lift. At this point, adjust the collective to obtain normal climb power and apply enough forward cyclic to overcome the tendency of the nose to rise. Hold an attitude that allows a smooth acceleration toward

Climbing airspeed and a commensurate gain in altitude so that the takeoff profile does not take the helicopter through any of the cross-hatched or shaded areas of the height-velocity diagram. As airspeed increases, place the aircraft in trim and allow a crab to take place to maintain ground track and a more favorable climb configuration. As the helicopter continues to climb and accelerate to best rate-of-climb, apply aft cyclic pressure to raise the nose smoothly to the normal climb attitude.

CAT "B" TAKEOFF

INTRODUCTION

1. This exercise introduces the fundamentals of basic CAT B transitions from forward flight. The transitions will normally be linked with an appropriate circuit pattern.

2. Making appropriate use of external markers and visual cues will aid both accuracy (aircraft attitude/ground track etc.) and position maintenance (hovering). You will be encouraged to make full and correct use of the various modes of MFD and PFD symbology presented to you.

CARRY OUT A STANDARD CAT "B" TAKEOFF FROM THE HOVER

1 The CAT B Take-Off should be a gentle and constant transition from the hover IGE to a climb at a suitable climb speed to an assigned altitude.

2 It is important that the aircraft's longitudinal axis is maintained and kept aligned with your ground track during the initial part of the transition by cross controlling until above 40 KIAS) This will allow a safe run on landing should it be required during the takeoff, for example after a OEI condition before TDP

3 Note the hover PI and engage the FTR on the collective, pedals and cyclic. Apply forward cyclic to achieve an attitude change of about 7° nose down from the hover attitude (The 139 generally hovers about 7° nose up so an indicated attitude of 0° should be the target). About half-way through the rotation, apply collective to increase power to 5% above Hover PI.

4 As the aircraft accelerates, maintain height with collective, maintain an accelerative attitude (0° is an accelerative attitude on the 139) and climb to achieve 50ft above the take-off surface at 50 KIAS. Then accelerate to Vy, 80KIAS

5 The FT on the pedals can now be released and continue to accelerate to 80 KIAS (Vy). Select an attitude to maintain Vy and climb smoothly.

6 Monitor PI for Take-Off power rating.

7 Conduct the after takeoff checks.

Landing gear lever: UP (after 200ft RAD ALT.

Confirm landing gear is up and locked (3 green and amber lights all extinguished).

NR/NF Confirm NF/NR at 100%.

AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.

   b. Monitoring:

      i. Airspeed and ROD (Vortex Ring considerations).

      ii. Wind velocity.

      iii. Power (PI)

   c. Checks.

   d. RFM limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control and keep all control actions smooth.

2. While it is better to visually judge hover height, it may be helpful to glance at the RAD ALT display (on the bottom right of the PFD) from time to time until the visual picture of a 5ft hover becomes more familiar.

CAT “A” CLEAR AREA TAKEOFF

CAT “A” operations in the AW139 are designed such that, in the event of the failure of a single engine at any time after the Take-Off transition has started, the helicopter can:

a. If the failure occurs prior to the Take-Off Decision Point (TDP), carry out a rejected take-off and safely land back on the Take-Off area, or,

b. If the failure occurs at or after the Take-Off Decision Point (TDP), climb away from the point of engine failure and continue forward flight with one engine inoperative (OEI).

Your instructor will give a detailed long briefing on Cat “A” operations as necessary to explain all relevant information on the meaning of flying Cat “A” profiles, including WAT charts, limitations etc.

CONDUCT A CAT “A” CLEAR AREA TAKEOFF

GENERAL DATA

VY 80 KIAS

Take-Off Decision Point (TDP) 30ft AGL

Vtoss 50 KIAS

1. Conduct the Before Take-Off Checks and bring the helicopter into a 5ft hover. Set NR/NF at 102%.Note the Hover PI. Take-Off PI will be Hover PI plus 18%

2. Engage the FTR on the collective, cyclic and pedals and begin the maneuver by steadily rotating the nose attitude from 7° nose up in the hover to -5°. As the nose passes through the horizon at 0°, apply power until the Take-Off PI (Hov+18%) is set.

3. If Take-Off Decision Point (TDP) is achieved before Vtoss, continue accelerating to 50 KIAS (Vtoss). At this point it is important to adjust the attitude to +5° to allow the aircraft to accelerate and climb to 200ft AGL.

4. Once at 200ft AGL continue to accelerate to Vy (80 KIAS) and set NR/NF to 100%. Select the appropriate power for the climb and adjust for balanced flight then release the pedal and collective FT and continue to climb to 1000ft (or as required).

5. Conduct the after-Takeoff checks.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Maintaining a lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose clear climb out and approach paths.

e. Carry out all the relevant checks.

f. RFM engine and PI (Power) limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Remember to pick markers before takeoff and for the final approach.

3. A glance at the RAD ALT on the PFD will assist in the transition to and from the hover but should only be used as an aid to maintaining good visual references as you become accustomed to the pronounced nose-up attitude of the new Type. In addition, the RAD ALT will provide the necessary cues to determine TDP. For multi-crew operations, the PNF will monitor this and make appropriate calls to the PF.

4. The nose-up attitude can also contribute to pilots having the feeling of being unsighted and this may be relieved if the aircraft is flown a few degrees offset to the final approach course.

COMMON ERRORS

1. Failing to use sufficient collective pitch to prevent loss of altitude prior to attaining translational lift.

2. Adding power too rapidly at the beginning of the transition from hovering to forward flight without forward cyclic compensation, causing the helicopter to gain excessive altitude before acquiring airspeed.

3. Assuming an extreme nose-down attitude near the surface in the transition from hovering to forward flight.

4. Failing to maintain a straight flightpath over the surface (ground track).

5. Failing to maintain proper airspeed during the climb.

6. Failing to adjust the throttle to maintain proper rpm.

7. Failing to transition to a level crab to maintain ground track.

NORMAL APPROACH TO A HOVER

STANDARDS

- Maintaining Initial Standards: 300 feet ± 50 feet
- Airspeed (Vy) 80 Kt. ± 10 Kt.
- Maintaining Landing Decision Point: 70 feet ± 10 feet
  50 Kt. ± 5 Kt.
- Approach Angle: Normal Approach Angle
- Ground Track: ± 10 °
- Transition to Hover: 3 feet ± 1 feet

DEFINITION

An approach is the transition from traffic pattern altitude to either a hover or to the surface. The approach should terminate at the hover altitude with the rate of descent and groundspeed reaching zero at the same time. Approaches are categorized according to the angle of descent as normal, steep, or shallow. In this chapter, concentration is on the normal approach. Steep and shallow approaches are discussed in the next chapter. Use the type of approach best suited to the existing conditions. These conditions may include obstacles, size and surface of the landing area, density altitude, wind direction and speed, and weight. Regardless of the type of approach, it should always be made to a specific, predetermined landing spot.

CAT “B” APPROACH

1. This exercise introduces the fundamentals of basic CAT B transitions from forward flight. The transitions will normally be linked with an appropriate circuit pattern.

2. Making appropriate use of external markers and visual cues will aid both accuracy (aircraft attitude/ground track etc.) and position maintenance (hovering). You will be encouraged to make full and correct use of the various modes of MFD and PFD symbology presented to you.

CAT “A” CLEAR AREA APPROACH

CAT “A” operations in the AW139 are designed such that, in the event of the failure of a single engine at any time during the approach to landing, the helicopter can:

a. If the failure occurs at or after the Landing Decision Point (LDP), make a safe approach and landing on the intended landing area or,

b. If the failure occurs prior to the Landing Decision Point (LDP), climb away from the point of engine failure and continue flight with one engine inoperative (OEI).

Instructor will give a detailed long briefing on Cat “A” operations as necessary to explain all relevant information on the meaning of flying Cat “A” profiles, including WAT charts, limitations etc.

TECHNIQUE

A normal approach uses a descent profile of between 7° and 12° starting at approximately 300–500 feet AGL.

On final approach, at the recommended approach airspeed and at approximately 300 feet AGL, the helicopter should be on the correct ground track (or ground alignment) for the intended landing site, but the axis of the helicopter does not have to be aligned until about 100' AGL to facilitate a controlled approach. [Figure 9-20] Just prior to reaching the desired approach angle, begin the approach by lowering the collective sufficiently to get the helicopter decelerating and descending down the approach angle. With the decrease in the collective, the nose tends to pitch down, requiring aft cyclic to maintain the recommended approach airspeed attitude. Adjust antitorque pedals, as necessary, to maintain trim. Pilots should visualize the angle from the landing point to the middle of the skids or landing gear underneath them in the cockpit and maneuver the helicopter down that imaginary slope until the helicopter is at a hover centered over the landing point or touching down centered on the landing point. The most important standard for a normal approach is maintaining a consistent angle of approach to the termination point. The collective controls the angle of approach. Use the cyclic to control the rate of closure or how fast the helicopter is moving towards the touchdown point. Maintain entry airspeed until the apparent groundspeed and rate of closure appear to be increasing. At this point, slowly begin decelerating with slight aft cyclic, and smoothly lower the collective to maintain approach angle. Use the cyclic to maintain a rate of closure equivalent to a brisk walk.

At approximately 25 knots, depending on wind, the helicopter begins to lose effective translational lift. To compensate for loss of effective translational lift, increase the collective to maintain the approach angle, while maintaining the proper rpm. The increase of collective pitch tends to make the nose rise, requiring forward cyclic to maintain the proper rate of closure.

As the helicopter approaches the recommended hover altitude, increase the collective sufficiently to maintain the hover. Helicopters require near maximum power to land because the inertia of the helicopter in a descent must be overcome by lift in the rotor system. At the same time, apply aft cyclic to stop any forward movement while controlling the heading with antitorque pedals.

CARRY OUT A STANDARD CAT B APPROACH TO THE HOVER

1. The Open Field Approach should be conducted as a Constant Angle Approach; it is a technique that you are already conversant with and just need to be familiarized with the required ‘sight picture’ in the AW139. Remember that a constant angle is exactly as the term suggests; so even a vertical approach (high to low hover) fulfils the criteria.

2. Confirm the aircraft is in the landing configuration:

The final approach checklist:

Landing Gear Down 3 GREEN

Monitor light sequence

Check light sequence Amber lights - extension

Amber lights off, green lights on

(Extended and locked)

Park Brake: AS REQ

Nose wheel lock: ON

Landing Lights: AS REQ

NR/NF: CK 100% below 90KIAS

CAS Clear

Cabin: Secure

3. Once the aircraft is lined up with the landing point, reduce airspeed gradually to arrive at a position 200ft above the touchdown point with a rate of descent of no more than 500fpm. Continue to decelerate to achieve 30 KIAS at 50ft. Control heading with the pedals. At 50ft rotate nose up to approximately 20° to decelerate further.

4. There should be no need for the ROD to exceed 500fpm during the approach

5. Anticipate the requirement for increased power as translational lift is lost and keep the aircraft aligned with ground track as the aircraft continues to decelerate to the hover.

6. Establish the hover at 5ft.

AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.

b. Monitoring:

iv. Airspeed and ROD (Vortex Ring considerations).

v. Wind velocity.

vi. Power (PI)

c. Checks.

d. RFM limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control and keep all control actions smooth.

2. While it is better to visually judge hover height, it may be helpful to glance at the RAD ALT display (on the bottom right of the PFD) from time to time until the visual picture of a 5ft hover becomes more familiar.

3. Use the correct approach angle and maintain the centerline on finals.

4. When descending below 150ft AGL, the vocal message “ONE-FIFTY-FEET” is activated regardless landing gear status. This message is suppressed if the AWG switch is set to REGRADE

5. The message “LANDING GEAR” activates at 200ft if the landing gear is not down.

CONDUCT A CAT “A” CLEAR AREA APPROACH

GENERAL DATA

Landing Decision Point (LDP) Height 50 feet

Airspeed 50 KIAS

Rate of Descent < 350fpm

1. Ensure the Before Landing checks have been completed and set up the aircraft on final approach as for normal circuits and CAT “B” approach.

2. Establish the approach to pass through 200ft with a rate of descent of no more than 500fpm and a speed of 50 KIAS. From this point, maintain the speed of 50 KIAS to the LDP of 50ft, reducing the rate of descent to not more than 350fpm.

3. Once past the LDP, raise the nose to increase the rate of deceleration and use collective to maintain a safe height over the runway until the aircraft can be brought back to the hover.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Maintaining a lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose clear climb out and approach paths.

e. Carry out all the relevant checks.

f. RFM engine and PI (Power) limitations.

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Remember to pick markers before takeoff and for the final approach.

3. A glance at the RAD ALT on the PFD will assist in the transition to the hover but should only be used as an aid to maintain good visual references as you become accustomed to the pronounced nose-up attitude of the new Type. In addition, the RAD ALT will provide the necessary cues to determine LDP. For multi-crew operations, the PNF will monitor this and make appropriate calls to the PF.

4. The nose-up attitude can also contribute to pilots having the feeling of being unsighted and this may be relieved if the aircraft is flown a few degrees offset to the final approach course.

COMMON ERRORS

1. Failing to maintain proper rpm during the entire approach.
2. Improper use of the collective in controlling the angle of descent.
3. Failing to make antitorque pedal corrections to compensate for collective changes during the approach.
4. Maintaining a constant airspeed on final approach instead of an apparent brisk walk.
5. Failing to simultaneously arrive at hovering altitude and attitude with zero groundspeed.
6. Low rpm in transition to the hover at the end of the approach.
7. Using too much aft cyclic close to the surface, which may result in tail rotor strikes.
8. Failure to crab above 100’AGL and slip below 100’AGL

MAXIMUM PERFORMANCE TAKEOFF (STEEP TAKEOFF)

STANDARDLAR

- Before Take Off Checks
- Accelerating Cycling (Attitude): -10°± 1°
- Power Setting: Until 30 Feet + % 3
- Altitude: 100 feet ± 10 feet
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

A maximum performance takeoff is used to climb at a steep angle to clear barriers in the flightpath. It can be used when taking off from small areas surrounded by high obstacles. Allow for a vertical takeoff, although not preferred, if obstruction clearance could be in doubt. Before attempting a maximum performance takeoff, know thoroughly the capabilities and limitations of the equipment. Also consider the wind velocity, temperature, density altitude, gross weight, center of gravity (CG) location, and other factors affecting pilot technique and the performance of the helicopter.

To accomplish this type of takeoff safely, there must be enough power to hover OGE in order to prevent the helicopter from sinking back to the surface after becoming airborne. A hover power check can be used to determine if there is sufficient power available to accomplish this maneuver. The angle of climb for a maximum performance takeoff depends on existing conditions. The more critical the conditions are, such as high density altitudes, calm winds, and high gross weights, the shallower the angle of climb is. In light or no wind conditions, it might be necessary to operate in the crosshatched or shaded areas of the height/velocity diagram during the beginning of this maneuver. Therefore, be aware of the calculated risk when operating in these areas. An engine failure at a low altitude and airspeed could place the helicopter in a dangerous position, requiring a high degree of skill in making a safe autorotative landing.

1. This lesson will introduce techniques that may be adopted to cater for terrain restrictions that prohibit the use of more conventional transition and approach profiles.

2. It is important to understand the difference between Power Margin and Thrust Margin.

a. Power Margin. Power margin is the difference between max PI available and the actual PI being used for a specific maneuver (e.g. in a 10ft hover at 95% PI with 100% being max continuous PI available, then the Power margin is (+)5%. If, to hover at 3ft, it is calculated that 103% PI would be required, but 100% is the max continuous available, then the Power Margin is (-) 3%).

b. Thrust Margin. Thrust margin is also a margin of power but expressed as a percentage of a relative weight. The minimum Thrust margin required is dependent on the environment, for example when operating in mountainous terrain a minimum of 10% is generally used to ensure sufficient power is available to allow OGE operations and overcome light turbulence.

TECHNIQUE

Before attempting a maximum performance takeoff, reposition the helicopter to the most downwind area to allow a longer takeoff climb, then bring the helicopter to a hover, and determine the excess power available by noting the difference between the power available and that required to hover. Also, perform a balance and flight control check and note the position of the cyclic. If the takeoff path allows, position the helicopter into the wind and return the helicopter to the surface. Normally, this maneuver is initiated from the surface. After checking the area for obstacles and other aircraft, select reference points along the takeoff path to maintain ground track. Also consider alternate routes in case the maneuver is not possible.

Begin the takeoff by getting the helicopter light on the wheels (3 feet hover). Pause and neutralize all aircraft movement. Slowly increase the collective and position the cyclic to lift off in a 40 knot attitude. This is approximately the same attitude as when the helicopter is light on the skids. Continue to increase the collective slowly until the maximum power available is reached (takeoff power is normally 10 percent above power required for hover). This large collective movement requires a substantial increase. in pedal pressure to maintain heading. Use the cyclic, as necessary, to control movement toward the desired flightpath and, therefore, climb angle during the maneuver. Maintain rotor rpm at its maximum, and do not allow it to decrease since you would probably need to lower the collective to regain it. Maintain these inputs until the helicopter clears the obstacle, or until reaching 100 feet for demonstration purposes. This point is called the Take Off Decision Point and is loudly signaled as “TDP”. Then, establish a normal climb attitude and power setting. Asin any maximum performance maneuver, the techniques used affect the actual results. Smooth, coordinated inputs coupled with precise control allow the helicopter to attain its maximum performance. (75Kt and 500fpm)

An acceptable but less preferred variation is to perform a vertical takeoff. This technique allows the pilot to descend vertically back into the confined area if the helicopter does not have the performance to clear the surrounding obstacles. During this maneuver, the helicopter must climb vertically and not be allowed to accelerate forward until the surrounding obstacles have been cleared. If not, a situation may develop where the helicopter does not have sufficient climb performance to avoid obstructions and may not have power to descend back to the takeoff point. The vertical takeoff might not be as efficient as the climbing profile, but is much easier to abort from a vertical position directly over the landing point. The vertical takeoff however places the helicopter in the avoid are of the height/velocity diagram for a longer time. This maneuver requires hover OGE power to accomplish.

CONDUCT A STEEP TAKEOFF

1. A minimum of 20% excess power margin is required to perform a steep take off; otherwise the manoeuvre cannot be conducted.

2. The departure should be initiated from a hover, after completing a power check to confirm Hover PI + 20% available. Raise the collective power by 20% PI. Adopt a slight accelerative attitude (from 7° to 5°) until you reach the “obstacle clearance height” nominated by the instructor (150ft, for example).

3. When clear of obstacle height, maintain the power but adjust the attitude to 0° and accelerate to Vy (80kts). On reaching Vy the power can be reduced to attain the desired Rate of Climb.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout and awareness of obstructions.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Power requirements.

e. Rate of climb limitations.

f. RFM PI limitations.

g. Carry out all the relevant checks.

h. Power margins.

NOTES FOR THE STUDENT

1. During the transition, if excessive forward cyclic is selected the aircraft will not climb at the desired ROC and once ground effect has been lost (approx. 2/3 of rotor diameter) the power required to clear the obstructions will increase.

2. During the steep approach be aware of having an approach speed too high resulting in excessive ROD to maintain approach angle. If the ROD becomes too high reduce speed in order to increase the descent angle. However, good airmanship should always prevail, and you should initiate a go-around if required.

3. As above during the approach be aware that if the approach angle too steep (poor over nose visibility, high power low airspeed). There may be a need to yaw the aircraft to have better visibility.

4. Use the correct approach angle and maintain the centerline on finals.

COMMON ERRORS

1. Failure to consider performance data, including height/ velocity diagram.

2. Nose too low initially causing horizontal flight rather than more vertical flight.

3. Failure to maintain maximum permissible rpm.

4. Abrupt control movements.

5. Failure to resume normal climb power and airspeed after clearing the obstacle.

STEEP APPROACH TO HOVER, SHALLOW APPROACH

STANDARDS

- Before Landing Checks
- Establishment of Initial Standards: 300 feet ± 50 feet
  50 Kt. ± 5 Kt.
- Establishing Landing Decision Point: 100 feet ± 10 feet
- Angle: Steep Approach Angle
- Ground Track: ± 10 °
- Transition to Hover: 3 feet ± 1 feet

DEFINITION

A steep approach is used primarily when there are obstacles in the approach path that are too high to allow a normal approach. A steep approach permits entry into most confined areas and is sometimes used to avoid areas of turbulence around a pinnacle. An approach angle of approximately 13° to 15° is considered a steep approach. Caution must be exercised to avoid the parameters for settling with power (20–100 percent of available power applied, airspeed of less than 10 knots, and a rate of descent greater than 300 fpm).

STEEP APPROACH

1. This lesson will introduce techniques that may be adopted to cater for terrain restrictions that prohibit the use of more conventional transition and approach profiles.

2. It is important to understand the difference between Power Margin and Thrust Margin.

c. Power Margin. Power margin is the difference between max PI available and the actual PI being used for a specific maneuver (e.g. in a 10ft hover at 95% PI with 100% being max continuous PI available, then the Power margin is (+)5%. If, to hover at 3ft, it is calculated that 103% PI would be required, but 100% is the max continuous available, then the Power Margin is (-) 3%).

d. Thrust Margin. Thrust margin is also a margin of power, but expressed as a percentage of a relative weight. The minimum Thrust margin required is dependent on the environment, for example when operating in mountainous terrain a minimum of 10% is generally used to ensure sufficient power is available

SHALLOW APPROACH

1. A shallow approach normally, but not necessarily, concludes in a rolling landing. This maneuver is also used when a lower-than-normal rate of descent is desired, i.e. SAS failure, Engine Failure, Engine Gov in Manual mode, etc.

2. Approach angles: Shallow. An approach angle of 3° is considered to be shallow for a VFR approach.

TECHNIQUE

CONDUCT A STEEP APPROACH

1. A steep approach angle is considered to be around 15°. Low speed steep approaches (around 20kts) and vertical descent maneuvers, should be performed with a rate of descent not initially exceeding 800fpm, reducing to 500fpm during the descent and to 350fpm near the end.

2. After performing before landing and final checks, the aircraft should be flown to a gate of 300ft above the landing surface at a speed of 40 knots.

3. When you have the right sight picture for the steep approach, lower the collective to reduce power and initiate a descent. Using the beep trim or FTR on the cyclic adopt a decelerative attitude of around 10°. Closely monitor and control the rate of descent with collective. It can be very easy to develop a high rate of descent and this must be avoided. Control speed with cyclic and maintain the decelerative attitude.

4. As the aircraft passes through approx. 80ft AGL confirm ROD and power available then gradually increase the collective to slow down the descent. Forward speed and ROD should be reduced smoothly and at the same time until the aircraft experiences a loss of translational lift but acquires the benefit of ground effect and the aircraft stabilizes in a normal 5ft hover.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout and awareness of obstructions.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Power requirements.

e. Rate of climb limitations.

f. RFM PI limitations.

g. Carry out all the relevant checks.

h. Power margins.

NOTES FOR THE STUDENT

1. During the steep approach be aware of having an approach speed too high resulting in excessive ROD to maintain approach angle. If the ROD becomes too high reduce speed in order to increase the descent angle. However, good airmanship should always prevail, and you should initiate a go-around if required.

2. As above during the approach be aware that if the approach angle too steep (poor over nose visibility, high power low airspeed). There may be a need to yaw the aircraft to have better visibility.

3. Use the correct approach angle and maintain the centerline on finals.

CARRY OUT A SHALLOW APPROACH

1. Conduct the Before Landing checks as for normal approach.

2. On finals at 80 KIAS but further away from the intended touchdown point than a normal approach (approx. 1nm) starts a rate of decent using the technique mnemonic T - PAT Engage the FTR on the collective and set power to give a ROD of approx. 300ft/min. Adjust the attitude with the cyclic beep trim to a gentle decelerative attitude of approximately of 7-10° nose up. Now check balance and trim if required. Monitor approach profile angle and adjust flight path as necessary, controlling the rate of deceleration with cyclic and maintaining a constant rate of descent of about 200-300ft/min in order to arrive at the desired touchdown point .

3. Aim to go through an imaginary "gate" on short finals appropriate to the profile being flown.

4. Once through the "gate" continue on the approach path and continue to decelerate in accordance with the profile being flown. Remember that once below 40kts ground speed you will be inside the safe run-on landing speed in the event of any malfunction that would require it.

5. Be careful not to apply too much collective as you approach the point of touchdown, You need it to land, not to fly away again. After touchdown, continue to lower the collective to prevent the aircraft from accelerating again once it achieves a level attitude.

AIRMANSHIP

1. The main airmanship points of this exercise are:

    a. Lookout.

    b. Monitor fuel and engine instruments.

    c. Monitor the wind velocity.

    d. Choose clear approach paths.

    e. Carry out all the relevant checks.

    f. Conform to ATC and R/T procedures for landing.

NOTES FOR THE STUDENT

1. Use the correct approach angle and maintain the centerline on finals.

2. Try to make a progressive deceleration. This will make it easier to maintain a constant angle approach.

COMMON ERRORS

1. Failing to maintain proper rpm during the entire approach.

2. Using collective improperly in maintaining the selected angle of descent.

3. Failing to make antitorque pedal corrections to compensate for collective pitch changes during the approach.

4. Slowing airspeed excessively in order to remain on the proper angle of descent.

5. Failing to determine when effective translational lift is being lost.

6. Failing to arrive at hovering altitude and attitude, and zero groundspeed almost simultaneously.

7. Utilizing low rpm in transition to the hover at the end of the approach.

8. Using too much aft cyclic close to the surface, which may result in the tail rotor striking the surface.

9. Failure to align landing gear with direction of travel no later than beginning of loss of translational lift.

TRAFFIC PATTERNS

STANDARDLAR

- Airspeed: ± 5 Kt.
- Altitude: ± 50 feet
- Turn Angle: 15° ± 5°
- Crosswind, downwind and base leg tracks, allowing for drift, within ± 10°

DEFINITION

A traffic pattern promotes safety by establishing a common track to help pilots determine their landing order and provide common reference. A traffic pattern is also useful to control the flow of traffic, particularly at airports without operating control towers. It affords a measure of safety, separation, protection, and administrative control over arriving, departing, and circling aircraft. Due to specialized operating characteristics, airplanes and helicopters do not mix well in the same traffic environment. At multiple-use airports, regulation states that helicopters should always avoid the flow of fixed-wing traffic. To do this, be familiar with the patterns typically flown by airplanes. In addition, learn how to fly these patterns in case air traffic control (ATC) requests a fixed-wing traffic pattern be flown.

An accepted helicopter traffic pattern is flown at 500 feet AGL and consists of right turns. [Figure 9-19] This keeps the helicopter out of the flow of fixed-wing traffic. A helicopter may take off from a helipad into the wind with a turn to the right after 300 feet AGL or as needed to be in range of forced landing areas. When 500 feet AGL is attained, a right turn to parallel the takeoff path is made for the downwind. Then, as the intended landing point is about 45 degrees behind the abeam position of the helicopter, a right turn is made and a descent is begun from downwind altitude to approximately 300 feet AGL for a base leg.

As the helicopter nears the final approach path, the turn to final should be made considering winds and obstructions.

Depending on obstructions and forced landing areas, the final approach may need to be accomplished from as high as 500 feet AGL. The landing area should always be in sight and the angle of approach should never be too high (indicating that the base leg is too close) to the landing area or too low (indicating that the landing area is too far away).

1. The standard training circuit combines most of the skills learnt in the previous exercises. However, it is important that you do not let the need for accuracy result in a poor lookout, as there may be other aircraft in the circuit, aircraft joining visually or perhaps instrument traffic, which in some cases, may be approaching to a different runway. There are new displays, symbology, methods of trim and FD Modes which will be unfamiliar, so airmanship is vital. It will be extra important to maintain a good lookout and to avoid the temptation to be “heads in” until familiarity with the new cockpit environment increases. Your instructor will be aware of this hazard in the training environment.

2. Making appropriate use of external markers and visual cues will aid accuracy in the circuit and hovering. Students will need to use the trim system correctly and will be encouraged to use the FD when manual flying in order to reduce pilot workload and aid accuracy.

TECHNIQUE

1. The standard training circuit is shown in diagrammatic form (see below). Although mainly self-explanatory, there are a few points which need emphasizing:

(a) The Lookout Turn. The lookout turn should be through 180°, this ensures that the approach path is clear, that no aircraft are overflying, and it also enables you to select final approach path markers, especially when flying circuits away from a runway, for example circuits to a helipad.

(b) The Transition. It is important that the aircraft’s longitudinal axis is maintained and kept aligned with your ground track during the initial part of the transition by cross controlling. This will allow a safe run on landing should it be required during the takeoff, for example in the event of an engine failure before TDP. Note the Tq and engage the FTR on the collective, pedals and cyclic. Select and brief for the Departure you intend to carry out (Clear Area, CAT A, CAT B). Once through TDP or committal point, select the attitude appropriate to the profile being flown. As you experience the transitional forces (flap back, inflow roll and translational lift) maintain the accelerative attitude and ensure the aircraft is climbing in accordance with the profile. Take full advantage of the ATT mode – release the FTR and let the aircraft maintain the attitude. Adopt balanced flight and continue to accelerate to achieve Vy 80 KIAS. Keep in mind the amount of power available in the AW139. – with just an instructor and a student pilot, the aircraft will be very light, and it may be necessary to reduce the power early in order to maintain both height and airspeed at a suitable level.

(c) The Climb. Once established in the climb, carry out the after-takeoff checks. Under normal conditions a climbing turn is made onto the crosswind leg at 600ft QFE and the level off, at 100 KIAS/1000ft QFE, should be completed before turning downwind. As in the Transition described above, it may be necessary to use significantly less power than the relevant profile demands in order to maintain circuit height and speed. In fresh or strong winds, it may be worth considering climbing straight ahead on the runway heading to 1000ft QFE before turning crosswind in order to penetrate far enough upwind to facilitate sufficient time on the downwind leg to complete the required checks.

(d) Turn onto the Crosswind Leg. The turn onto the crosswind leg should be made using between 20 and 30° AOB. Use the FTR on the cyclic to select the AOB and then when on the required heading roll out and release the FT. Allow for drift, laying off approximately 1° for every knot of wind. Confirm that the ground track is 90° to the runway and pick a suitable marker to track towards. Adjust heading with beep trim. Level off 100 KIAS/1000ft QFE using the technique:

A – Attitude Beep trim the speed stable attitude for 100 KIAS

P – Power Adjust the power required for straight and level flight. Using the collective FTR.

T – Trim Release all FTR and trim the aircraft including the pedals for S&L flight.

Turn onto the downwind leg using up to 30° AOB. Use the same technique as the crosswind turn.

(e) The Downwind Leg. After rolling out of the turn, release the FT on the cyclic and use the beep trim to make fine adjustments for pitch and roll attitudes to maintain speed and wings level. For small adjustments in roll, use the cyclic against spring pressure to turn in order to track parallel to the duty runway and check that spacing is suitable then select circuit markers for future use. Complete the “approach and final checks” as early as convenient.

When the landing point is approximately in the half past 4 / half past 7 o’clock position use the following techniques to turn on to the base leg. Trim the aircraft using the

T - Trim Depress the FTR on the collective.

P - Power Reduce power (30-35% PI would be a useful target to begin with)

A - Attitude Initially maintain attitude until a positive ROD is established then gently select a decelerative attitude with beep trim . 7-10° nose-up should be an initial target.

T - Trim Engage the FTR on the cyclic and roll onto base leg using up to 30° AOB and roll out to track at 90° to the runway, allowing for wind in the same way as during the turn onto the crosswind leg. Adjust speed to 80 KIAS. Once speed stable on base leg release the FT. Fine tune as required and trim the pedals for balanced flight.

(f) The Base Leg. Co-ordinate the turn onto finals using up to 30° AOB and adjust power as required to roll out at 500ft QFE aligned with the markers/runway. If the circuit has been flown accurately, you should roll out as you level off.

(g) Finals. The aircraft should now be lined up with the landing point, at approximately 500ft QFE. Continue to decelerate to achieve LDP appropriate to the Approach you have elected to fly. Balanced flight will be maintained by the aircraft until 40 knots below which it will be necessary to cross control to keep the nose aligned with the runway. (Note that the aircraft heading may not be the same as the runway heading if there is any crosswind component)

2. As the required ‘sight picture’ is intercepted, engage the FTR and lower the collective. Adopt a decelerative attitude with the beep trim. Again, set 10° nose up to begin with and adjust as necessary. Adjust the collective to maintain the touchdown point in the desired ‘sight picture’ while looking out laterally to assess approach speed. There should be no reason for your ROD to exceed 500ft/min. As the approach develops and the touchdown point gets nearer, engage the FTR on the cyclic at continue to decelerate through LDP. Anticipate the requirement for increased power as translational lift is lost, aligning the aircraft (longitudinally) with ground track as you decelerate through Vtoss for the particular approach, thus creating a favorable condition in the event of having to carry out a run-on landing following an emergency.

3. Bring the helicopter to a hover at 5ft AGL. Land when ready.

CARRY OUT THE PRE-LANDING APPROACH AND FINAL CHECKLIST

1. The Pre-Landing checks are normally carried out at a time of low workload, normally downwind in the circuit or before joining an airfield.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout.

b. Monitor fuel and engine instruments.

c. Monitor the wind velocity.

d. Choose clear climb out and approach paths, ideally parallel to the duty runway.

e. Conform to ATC and R/T procedures in the circuit.

f. Carry out all the relevant checks.

g. “Heads in” “Heads out calls”

NOTES FOR THE STUDENT

1. Take care not to over-control.

2. Identify the beep trim on the cyclic and keep your thumb on it as it will be used a lot during the circuit. This will avoid the need to keep looking inside the cockpit to re-identify it.

3. Remember to pick markers before and during the initial circuit to assist in accuracy for subsequent circuits.

4. It may be helpful in the early stages of Type Rating training to refer to the RHT on the PFD from time to time as an aid to judging hover height until you become more accustomed to the higher nose-up attitude of the AW139 and, as a consequence, the comparatively high seating position of the pilot with respect to the ground in the normal 5ft hover.

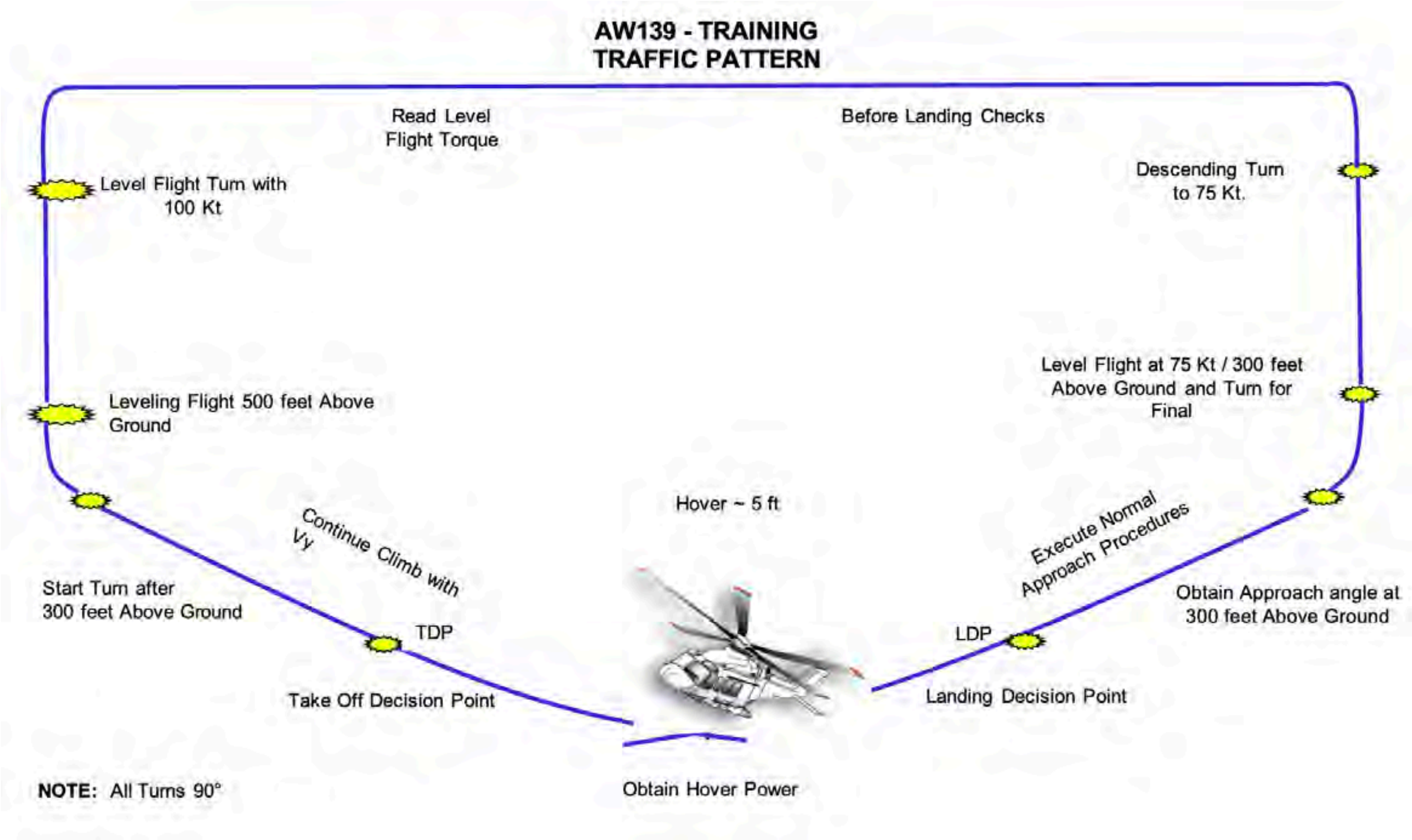
5. During the Take-Off and departure, minimize any lateral movement and try to achieve the precision needed to accurately fly the various profiles from the outset. Above 40knots, the turn co-ordination function will be active, and it will only be necessary to cover the pedals without actually pressing on them.

6. Maintain lookout and SA in the circuit especially with regards to other traffic.

7. Use the correct approach angle and maintain the centerline on finals.

COMMON ERRORS

- Not complying with the square traffic pattern,
- Not making the necessary wind corrections,
- Causing speed changes in turns,
- Being late in altitude and speed corrections,
- Not being able to coordinate the descending turn when returning to the main leg,
- Not being able to establish the starting standards when returning to final approach.



AW139 - TRAINING
TRAFFIC PATTERN
Read Level
Flight Torque
Before Landing Checks
Level Flight Turn with
100 Kt
Descending Turn
to 75 Kt.
Leveling Flight 500 feet Above
Ground
Level Flight at 75 Kt / 300 feet
Above Ground and Turn for
Final
Hover ~ 5 ft
Continue Climb with
Vy
Execute Normal
Approach Procedures
Start Turn after
300 feet Above Ground
Obtain Approach angle at
300 feet Above Ground
TDP
LDP
Take Off Decision Point
Landing Decision Point
NOTE: All Turns 90°
Obtain Hover Power

NORMAL TAKEOFF FROM THE SURFACE (ROLLING TAKEOFF)

STANDARDS

- Before takeoff checks
- Cyclic acceleration: Passing 3 feet ADI -10°± 1°
- Power regulation: ± % 3
- Heading: ± 10°
- Ground Track: ± 10 feet

DEFINITION

Normal takeoff from the surface is used to move the helicopter from a position on the surface into effective translational lift and a normal climb using a minimum amount of power. If the surface is dusty or covered with loose snow, this technique provides the most favorable visibility conditions and reduces the possibility of debris being ingested by the engine.

The Rolling Takeoff in training can be used to simulate a helicopter in a condition of reduced power margin (heavy weight, high altitude and temperature) or that can be used, at pilot discretion to take off from surfaces that are sandy, dusty or that will otherwise reduce visibility when power is applied.

TECHNIQUE

Place the helicopter in a stationary position on the surface. Lower the collective to the full down position, and reduce the rpm below operating rpm. Visually clear the area and select terrain features or other objects to aid in maintaining the desired track during takeoff and climb out. Increase the throttle to the proper rpm, and raise the collective slowly until the helicopter is light on the skids. Hesitate momentarily and adjust the cyclic and antitorque pedals, as necessary, to prevent any surface movement. Continue to apply upward collective. As the helicopter leaves the ground, use the cyclic, as necessary, to begin forward movement as altitude is gained. Continue to accelerate, and as effective translational lift is attained, the helicopter begins to climb. Adjust attitude and power, if necessary, to climb in the same manner as a takeoff from a hover. A second less efficient but acceptable technique is to attempt a vertical takeoff to evaluate if power or lift is sufficient to clear obstructions. This allows the helicopter to be returned to the takeoff position if required.

ROLLING TAKEOFF

TRANSITION TO FORWARD FLIGHT USING ROLLING TAKEOFF

1. Ensure that the Before Takeoff Checks have been carried out.

2. With a clear area ahead, using the same method covered in preparation for ground taxiing, engage the FTR and raise the collective to around 30% PI. Utilize a marker ahead of the aircraft and initiate acceleration by engaging the cyclic FTR and applying forward cyclic, keeping a 'wings level' attitude. Apply power gradually while maintaining the cyclic position, gradually increasing PI to the training limit set by the instructor. The aircraft will start moving forward and gradually accelerate. As soon as the speed reaches translational lift or 30 knots GS, whichever comes first (max speed on the ground is 40 knots GS) you will need to start raising the collective to bring the PI to the planned limit, easing the aircraft off the ground.

3. Continue in ground effect until Vtoss (50 knots) then adjust attitude to start the climb and continue accelerating to Vy.

4. Carry out After Take-Off checks once past 200ft.

AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.
   b. Monitor fuel and engine instruments.
   c. Awareness of the wind velocity.
   d. Choose clear climb out and approach paths.
   e. Performance calculation, interpolation and interpretation.
   f. Carry out all the relevant checks.
   g. Best ROC and best AOC speeds.

NOTES FOR THE STUDENT

1. During a limited power approach any decision to overshoot should be made early and the decision should be based on the following:

a. ROD is likely to exceed 500ft/min.

b. Final appraisal of landing area highlights surface imperfections (potholes, obstructions etc.).

c. Overshooting intended touchdown point (leaving insufficient stopping distance).

d. Run-on ground speed is likely to be excessive.

To carry out an overshoot from the approach:

a. Maintain the attitude (when operating very close to power limits and with enough height, you may increase power margin by adjusting to V2 (40 KIAS).

b. This technique may increase ROD temporarily.

c. Increase collective to max power available.

d. Accelerate to Vy once above 200ft AGL and a positive ROC is established.

2. The tail will not touch the ground if the aircraft pitch attitude is less than 10°, but safety consideration and training margins must be applied so the target attitude for the take-off should ideally be not more than 5° and certainly not more than 10° for the touchdown.

3. Maintain lookout and especially with regards to other traffic.

4. Use the correct approach angle and maintain the centerline on finals.

5. There is a general tendency during touchdown to maintain excess nose up attitude, leading to the tail getting close to the ground and so you need to be alert to the pitch attitude during the approach and landing.

6. You must not relax after touchdown. Directional control must be maintained until the aircraft has come to a complete stop.

COMMON ERRORS

1. Departing the surface in an attitude that is too nose low. This situation requires the use of excessive power to initiate a climb.

2. Using excessive power combined with a level attitude, which causes a vertical climb, unless needed for obstructions and landing considerations.

3. Application of the collective that is too abrupt when departing the surface, causing rpm and heading control errors.

NORMAL APPROACH TO THE SURFACE (ROLLING LANDING)

STANDARDS

- Before landing checks
- Establishing Initials: 300 feet ± 50 feet
  Airspeed: 75 Kt. ± 10 Kt
- Establishing Decision Point: 70 feet ± 10 feet
  50 Kt. ± 5 Kt.
- Approach Angle: Normal approach angle
- Maintain heading/balance +5deg.
- Within stated notional power limit when given.
- Drift on the ground: 1 foot

DEFINITION

A normal approach to the surface or a no-hover landing is often used if loose snow or dusty surface conditions exist. These situations could cause severely restricted visibility, or the engine could possibly ingest debris when the helicopter comes to a hover. The approach is the same as the normal approach to a hover; however, instead of terminating at a hover, continue the approach to touchdown. Touchdown should occur with the skids level, zero groundspeed, and a rate of descent approaching zero.

1. The rolling landing has the additional value of being required technique in the event of engine failure in certain profiles and also for landing after a malfunction or loss of controllability (Servo/SAS/tail rotor malfunction, etc.).

TECHNIQUE

As the helicopter nears the surface, increase the collective, as necessary, to cushion the landing on the surface, terminate in a skids-level attitude with no forward movement.

CARRY OUT AN APPROACH TO A RUNNING LANDING

1. A running landing is only possible on smooth surfaces. The forward speed must be below 40kts ground speed and ground contact should be made at minimum vertical speed.

2. The approach and Final checks must be conducted as required by Normal Checklist.

3. Your instructor will nominate a maximum power available for the simulated exercise.

4. The path of the Approach will initially be a CAT B approach but aiming for a gate of 200ft and 50 knots. You need to set a pitch angle to keep that speed and then control the Rate of Descent with the collective. This should be not greater than 500fpm but ideally somewhere between 200-300fpm. As the speed reduces below 40 knots, the pedals should be used, where necessary, to maintain the heading in line with the final approach course.

5. Pitch up attitude for touchdown may vary a little depending on the combination of speed and rate of descent achieved as you near the ground but should not at any time be greater than 10°. This must be a limit – keep in mind that at 17°, the tail will strike the ground.

6. After touchdown, control the heading with pedals and lower the collective gently but without undue delay. Keep in mind the nose-wheel will take a little more time to touch down and a rapid decrease in Power (PI) could easily result in a rapid yaw to the left. Differential braking may be used to assist heading control.

7. Once the aircraft is fully on the ground, it should be brought to a complete stop before carrying out the after landing checks and before beginning any ground taxiing.

AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout.
   b. Monitor fuel and engine instruments.
   c. Awareness of the wind velocity.
   d. Choose clear climb out and approach paths.
   e. Performance calculation, interpolation and interpretation.
   f. Carry out all the relevant checks.
   g. Best ROC and best AOC speeds.

NOTES FOR THE STUDENT

1. During a limited power approach any decision to overshoot should be made early and the decision should be based on the following:

   a. ROD is likely to exceed 500ft/min.

b. Final appraisal of landing area highlights surface imperfections (potholes, obstructions etc).

c. Overshooting intended touchdown point (leaving insufficient stopping distance).

d. Run-on ground speed is likely to be excessive.

To carry out an overshoot from the approach:

e. Maintain the attitude (when operating very close to power limits and with enough height, you may increase power margin by adjusting to V2 (40 KIAS).

f. This technique may increase ROD temporarily.

g. Increase collective to max power available.

h. Accelerate to Vy once above 200ft AGL and a positive ROC is established.

2. The tail will not touch te ground if the aircraft pitch attitude is less than 10°, but safety consideration and training margins must be applied so the target attitude for the take-off should ideally be not more than 5° and certainly not more than 10° for the touchdown.

3. Maintain lookout and especially with regards to other traffic.

4. Use the correct approach angle and maintain the centerline on finals.

5. There is a general tendency during touchdown to maintain excess nose up attitude, leading to the tail getting close to the ground and so you need to be alert to the pitch attitude during the approach and landing.

6. You must not relax after touchdown. Directional control must be maintained until the aircraft has come to a complete stop.

COMMON ERRORS

1. Terminating to a hover, and then making a vertical landing.
2. Touching down with forward movement.
3. Approaching too slow, requiring the use of excessive power during the termination.
4. Approaching too fast, causing a hard landing
5. Not maintaining skids aligned with direction of travel at touchdown. Any movement or misalignment of the skids or gear can induce dynamic rollover.

SPEED CHANGES IN LEVEL FLIGHT

STANDARDS

- Altitude: ± 100 feet
- Airspeed: Slowing 65 Kt. ± 10 Kt. - Accelerating 120 Kt. ± 10 Kt.
- Track: ± 10°

DEFINITION

1. This exercise will consolidate the flying controls co-ordination required in order to achieve a desired flight path and speed. The exercises covered are flown both with and without holds engaged, providing an ideal opportunity to consolidate on previously taught techniques.

2. The majority of the aircraft's displayed information is in the form of a digital readout and therefore the following points should be considered when interpreting digital indications:

a. Accuracy. Digital indications are accurate to as little as 1kt or 1ft and therefore, unlike analogue instruments, are constantly registering small changes. Although you should always strive to fly accurately, guard against chasing digital readouts by allowing the aircraft to stabilize before making any flight control corrections.

b. Interpretation. Maintaining 120KIAS/2500ft using conventional analogue instruments can be achieved by establishing apparent clock indications on the relevant gauges. For example: indications of twelve o'clock on the ASI and two thirty on the Bar Alt and not actually having to remember the required figures. Digital readouts as seen on the PFD require continuous mental interpretation.

NOTE: *Deceleration for training purposes 65 Kt. will be done up to speed.*

TECHNIQUE

CARRY OUT SPEED CHANGES MAINTAINING ALTITUDE AND HEADING WITHOUT FLIGHT DIRECTOR

1. Although initially it may help to equate power (PI) indications to various speeds (as done on previous aircraft types), be aware that these indications will vary significantly dependent upon environmental conditions and aircraft weight. The Vertical Speed Indicator on the PFD is a useful reference for adjusting the collective to obtain the correct power setting for level flight. However, this does not relax the importance of scanning PI whenever adjusting the collective to prevent any likelihood of an over-torque.

2. The technique for speed adjustment is unchanged (i.e. attitude, power, trim). As always, ensure a good lookout prior to and during the maneuver. The following will be practiced:

a. Deceleration. To reduce speed, adopt a decelerative attitude by either using the cyclic beep trim, or engaging the FTR, selecting the desired decelerative attitude and releasing the trim. At the same time, engage the collective FTR and lower the collective in order to prevent the aircraft from climbing. Confirm with the VSI display on the PFD to maintain the altitude. Maintain the decelerative attitude and anticipate the forward cyclic beep trim input required to establish the new required speed. Or using the FTR technique re-select a speed stable attitude. Adjust the collective to maintain the altitude at the new speed and trim the aircraft. Check balance and aircraft heading and trim the pedals if required. (Turn co-ordination should maintain balance). Confirm that the Speed Trend Indicator on the speed tape on the PFD indicates speed stable. Note the pitch attitude for that speed setting.

b. Acceleration. To increase speed, adopt an accelerative attitude by either using the cyclic beep trim, or engaging the FTR. Engage the collective FTR and raise the lever in order to prevent the aircraft from descending. Check PI. Maintain the accelerative attitude and anticipate the aft cyclic beep trim input required to establish the new required speed, and trim the aircraft. Check balance and aircraft heading and trim the pedals if required. (Turn co-ordination should maintain balance). Confirm the Speed Trend Indicator next to the speed tape indicates speed stable. Note the pitch attitude for that speed setting.

CARRY OUT SPEED CHANGES WITH THE USE OF FLIGHT DIRECTOR WHILST MAINTAINING ALTITUDE AND HEADING MANUALLY

1. The Upper Modes are engaged Guidance Controller. For speed changes IAS is used.

2. Engage IAS, the PFD will display IAS at the top, the magenta bug will appear on the airspeed tape and the digital read out will appear above the speed tape. The IAS can now be adjusted with the cyclic beep trim.

3. When changing the IAS with the cyclic beep trim, the FTR on the collective must be engaged, and as previously described, power adjusted to maintain the altitude. Check PI. Release the collective FT for the new airspeed.

4. Remember that turn co-ordination is active automatically so the aircraft balance should be maintained.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout. CRM "Heads in" "Heads out calls".

b. Monitor engine instruments.

c. Monitoring Tq and limitations

d. Monitor the automation.

NOTES FOR THE STUDENT

1. Identify the beep trim on the cyclic and keep your thumb on it. This will avoid the need to keep looking inside the cockpit to identify it. Focus can then be on the PFD bug to ensure correct speed selection.

2. As always, when using automation, the flight path of the aircraft must be monitored.

3. Maintain lookout and SA (Situational Awareness) especially with regards to other traffic.

COMMON ERRORS

- Failure to control environment.
- To start the action without establishing the initial principles.
- Using the controls uncoordinated and very serially.
- Not being able to maintain altitude.
- Falling below the deceleration speed.
- Not being able to keep track of direction and ground.

RAPID DECELERATION OR QUICK STOP

STANDARDS

- Height ± 20ft. (Quick stop)
- Heading ± 10°(Quick stop)
- Height ± 50ft (Rapid deceleration)
- Heading ±10° (Rapid deceleration)
- Airspeed: 75 Kt. ± 10 Kt.
- Deceleration Attitude: +20°- +25° ± 3°
- Track: ± 10°

DEFINITION

This maneuver is used to decelerate from forward flight to a hover. It is often used to abort takeoffs, to stop if something blocks the helicopter flightpath, or simply to terminate an air taxi maneuver, as mentioned in the Aeronautical Information Manual (AIM). A quick stop is usually practiced on a runway, taxiway, or over a large grassy area away from other traffic or obstacles.

1. Rapid deceleration straight ahead is a useful exercise to develop co-ordination and accuracy during training.

2. Quick stops are essentially advanced co-ordination exercises, although they do have some operational applications whenever a rapid transition from forward flight to the hover is required. Conducting a Quick stop is also a way of aborting a departure if required. As these are low level maneuvers, you must put more emphasis on the use of external references when judging attitude, angle of bank, height and heading. However, the lookout, attitude, instrument scan is still appropriate. It is important to choose a fairly level, obstruction free area for Quick stops, and they are therefore normally carried out on an airfield.

TECHNIQUE

The maneuver requires a high degree of coordination of all controls. It is practiced at an altitude that permits a safe clearance between the tail rotor and the surface throughout the maneuver, especially at the point where the pitch attitude is highest. The altitude at completion should be no higher than the maximum safe hovering altitude prescribed by that particular helicopter’s manufacturer. In selecting an altitude at which to begin the maneuver, take into account the overall length of the helicopter and its height-velocity diagram. Even though the maneuver is called a rapid deceleration or quick stop, it is performed slowly and smoothly with the primary emphasis on coordination.

CARRY OUT A QUICKSTOP

1. Flare Effects. When the attitude is changed to produce a reduction in speed (i.e., flared), the aircraft will experience additional effects. These flare effects will increase in magnitude as the overall attitude change, rate of attitude change or entry speed increases. As the whole point of the quick stop is to rapidly reduce groundspeed to zero and establish the hover or reject, it is important to judge the flare by reference to groundspeed.

a. Height. The aircraft will climb as soon as the flare is applied.
b. Heading. With a reduction in airspeed, the aircraft will yaw to the right.
c. Torque. The flare produces a tendency for the NR to increase. This leads to a reduction in PI. If, in addition, the height is maintained by lowering the collective lever, with accompanying right pedal, the overall reduction in PI can be quite marked. With a rapid flare from high entry speeds the collective lever would need to be lowered fully to maintain height, and PI could reduce to zero. The maneuver should never be so harsh as to result in a very low PI and possible needle split. If this should happen either raise the collective or reduce the severity of the flare.

2. Set up into wind at 80 KIAS, or at 80 KIAS during the take off. At an appropriate point (minimum of 50ft AGL) verbalize “quick stop quick stop go” Engage the FTR on all three controls and begin the flare with the cyclic. Adjust the collective to maintain height (using the backdrop technique and confirm visually that the aircraft is not climbing or descending).
Use as much as 20° nose up. (With over 20° nose-up attitude you may lose sight of your forward visual references). The “Flare Effects” as previously mentioned will take effect and the aircraft will begin to decelerate. As the airspeed reduces below 30 KIAS anticipate the loss of translational lift and apply more power to stop the aircraft from descending. Maintain the heading with pedals by using a marker in the 12 o’clock or dead-ahead position and anticipate the amount of pedal input required to maintain heading as power is increased. Once in or close to the hover descend forward and down to a 5ft hover or to a landing.

CARRY OUT A RAPID DECELERATION

1. The Rapid Deceleration (and acceleration) will be performed at an altitude of 1000ft AGL minimum, at 80 KIAS straight and level in an area clear of traffic, into wind.
2. At 80 KIAS straight and level engage the FTR on all three controls and smoothly change the aircraft attitude to 20° nose up while simultaneously lowering the collective to maintain height. This is more difficult to visually judge at altitude so you will need to confirm and make reference to the VSI during the manoeuvre.
3. As the speed reduces below 40 KIAS adopt a pitch down nose attitude of 10°. At the same time apply power as required in order to achieve 80 KIAS without losing altitude.
4. Once airspeed is established at 80 KIAS exercise may start again. It is important during the practice of rapid deceleration/acceleration that you maintain constant altitude and constant heading.

AIRMANSHIP

1. The main airmanship points of this exercise are:
   a. Lookout.
   b. Monitor fuel and engine instruments.
   c. Monitor the wind velocity.
   d. Choose a sufficient large, level and clear area.
   e. Carry out all the relevant airmanship and landing checks.

NOTES FOR THE STUDENT

1. Do not focus totally on the VSI during these maneuvers maintain a lookout and just confirm the ROC/ROD on the VSI.
2. Remember to pick a marker at the 12 o’clock or dead ahead position of the aircraft before commencing the exercises.
3. Maintain lookout and SA especially with regards to other traffic.
4. Quick stop Errors. There are three major errors that could occur when practicing Quick stops:
a. Flare too Low. Clearly, at very low level it would be possible to strike the tail during the flare. For this reason, Quick stops are practiced at a minimum of 50ft AGL.
b. Descending in the Flare. Even if the flare is started at the correct height, if you allow the aircraft to descend in the flare the tail could strike the ground. In addition if the airspeed is low and power is being applied, the conditions for vortex ring exist.
c. Maintaining the Flare with Zero Groundspeed. Should the flare be maintained with zero groundspeed and with power being applied, the aircraft would start to accelerate backwards. This could lead to a negative airspeed and possible over-controlling

COMMON ERRORS

1. Initiating the maneuver by lowering the collective without aft cyclic pressure to maintain altitude.
2. Initially applying aft cyclic stick too rapidly, causing the helicopter to balloon (climb).
3. Failing to effectively control the rate of deceleration to accomplish the desired results.
4. Allowing the helicopter to stop forward motion in a tail-low attitude.
5. Failing to maintain proper rotor rpm.

6. Waiting too long to apply collective pitch (power) during the recovery, resulting in excessive manifold pressure or an over torque situation when collective pitch is applied rapidly.
7. Failing to maintain a safe clearance over the terrain.
8. Using antitorque pedals improperly, resulting in erratic heading changes.
9. Using an excessively nose-high attitude.

RECONNAISSANCE PROCEDURES

STANDARDS

- Airspeed: (Vy) 80 Kt. ± 10 Knot.
- Altitude: ± 100 feet
- Observation angle: 30° - 45°

DEFINITION

When planning to land or take off at an unfamiliar site, gather as much information as possible about the area.

Reconnaissance techniques are ways of gathering this information.

High Reconnaissance

The purpose of conducting a high reconnaissance is to determine direction and speed of the wind, a touchdown point, suitability of the landing area, approach and departure axes, and obstacles for both the approach and departure. The pilot should also give particular consideration to forced landing areas in case of an emergency.

Altitude, airspeed, and flight pattern for a high reconnaissance are governed by wind and terrain features. It is important to strike a balance between a reconnaissance conducted too high and one too low. It should not be flown so low that a pilot must divide attention between studying the area and avoiding obstructions to flight. A high reconnaissance should be flown at an altitude of 300 to 500 feet above the surface. A general rule to follow is to ensure that sufficient altitude is available at all times to land into the wind in case of engine failure. In addition, a 45° angle of observation generally allows the best estimate of the height of barriers, the presence of obstacles, the size of the area, and the slope of the terrain. Always maintain safe altitudes and airspeeds and keep a forced landing area within reach whenever possible.

Low Reconnaissance

A low reconnaissance is accomplished during the approach to the landing area. When flying the approach, verify what was observed in the high reconnaissance, and check for anything new that may have been missed at a higher altitude, such as wires and their supporting structures (poles, towers, etc.), slopes, and small crevices. If the pilot determines that the area chosen is safe to land in, the approach can be continued. However, the decision to land or go around must be made prior to decelerating below effective translational lift (ETL), or before descending below the barriers surrounding the confined area.

If a decision is made to complete the approach, terminate the landing to a hover in order to check the landing point carefully before lowering the helicopter to the surface. Under certain conditions, it may be desirable to continue the approach to the surface. Once the helicopter is on the ground, maintain operating rpm until the stability of the helicopter has been checked to be sure it is in a secure and safe position.

Ground Reconnaissance

Prior to departing an unfamiliar location, make a detailed analysis of the area. There are several factors to consider during this evaluation. Besides determining the best departure path and identifying all hazards in the area, select a route that gets the helicopter from its present position to the takeoff point while avoiding all hazards, especially to the tail rotor and landing gear.

Some things to consider while formulating a takeoff plan are the aircraft load, height of obstacles, the shape of the area, direction of the wind, and surface conditions. Surface conditions can consist of dust, sand and snow, as well as mud and rocks. Dust landings and snow landings can lead to a brownout or whiteout condition, which is the loss of the horizon reference. Disorientation may occur, leading to ground contact, often with fatal results. Taking off or landing on uneven terrain, mud, or rocks can cause the tail rotor to strike the surface or if the skids get caught can lead to dynamic rollover. If the helicopter is heavily loaded, determine if there is sufficient power to clear the obstacles. Sometimes it is better to pick a path over shorter obstacles than to take off directly into the wind. Also evaluate the shape of the area so that a path can be chosen that will provide you the most room to maneuver and abort the takeoff if necessary. Positioning the helicopter to the most downwind portion of the confined area gives the pilot the most distance to clear obstacles. Wind analysis also helps determine the route of takeoff. The prevailing wind can be altered by obstructions on the departure path and can significantly affect aircraft performance. There are several ways to check the wind direction before taking off. One technique is to watch the tops of the trees; another is to look for any smoke in the area. If there is a body of water in the area, look to see which way the water is rippling. If wind direction is still in question revert back to the last report that was received by either ATIS or airport tower.

COMMON ERRORS

- Making major changes in flight altitude and speed,
- Approaching too close or far from the region without controlling the turns according to the wind,
- Not paying attention to other traffic,
- Not choosing suitable forced landing sites,
- Not choosing a suitable landing site,
- Not choosing the correct landing and take-off direction.

CONFINED AREA OPERATIONS

STANDARDS

Before Approach

- Altitude: ± 100 ft.
- Airspeed: ± 10 Kt.
- Reconnaissance of landing Site.

On Approach

- Maintaining the ground track.
- Establishment and maintenance of a fixed approach angle.
- Maintaining the proper rate of descent.
- Low reconnaissance.
- Making a soft and controlled landing in the first 1/3 of the landing area.

Before Take Off

- Proper completion of the ground reconnaissance and selection of an appropriate departure destination.
- Carrying out a hover power check and completing pre-take-off checks if necessary.
- Taxiing to the departure point.

Before Reaching Obstacles

- Heading: ±10°.
- Maintaining the ground track.
- Using the necessary power to pass the obstacles without exceeding the limits.

After Obstacles

- Climbing speed: ±10 Kt.
- Rate of Climb: ± 100 fpm.
- Keeping the aircraft on trim.
- Maintaining the ground track.

DEFINITION

A confined area is an area where the flight of the helicopter is limited in some direction by terrain or the presence of obstructions, natural or manmade. For example, a clearing in the woods, a city street, a road, a building roof, etc., can each be regarded as a confined area. The helicopter pilot has added responsibilities when conducting operations from a confined area that airplanes pilots do not. He or she assumes the additional roles of the surveyor, engineer, and manager when selecting an area to conduct operations. While airplane pilots generally operate from known pre-surveyed and improved landing areas, helicopter pilots fly into areas never used before for helicopter operations. Generally, takeoffs and landings should be made into the wind to obtain maximum airspeed with minimum groundspeed. The pilot should begin with as nearly accurate an altimeter setting as possible to determine the altitude.

There are several things to consider when operating in confined areas. One of the most important is maintaining a clearance between the rotors and obstacles forming the confined area. The tail rotor deserves special consideration because, in some helicopters, it is not always visible from the cabin. This not only applies while making the approach, but also while hovering. Another consideration is that wires are especially difficult to see; however, their supporting devices, such as poles or towers, serve as an indication of their presence and approximate height. If any wind is present, expect some turbulence.

Something else to consider is the availability of forced landing areas during the planned approach. Think about the possibility of flying from one alternate landing area to another throughout the approach, while avoiding unfavorable areas. Always leave a way out in case the landing cannot be completed, or a go-around is necessary.

During the high reconnaissance, the pilot needs to formulate a takeoff plan as well. The heights of obstacles need to be determined. It is not good practice to land in an area and then determine that insufficient power exists to depart. Generally, more power is required to take off than to land so the takeoff criteria is most crucial. Fixing the departure azimuth or heading on the compass is a good technique to use. This ensures that the pilot is able to take off over the preselected departure path when it is not visible while sitting

in the confined area.

Approach

A high reconnaissance should be completed before initiating the confined area approach. Start the approach phase using the wind and speed to the best possible advantage. Keep in mind areas suitable for forced landing. It may be necessary to choose a crosswind approach that is over an open area, then one directly into the wind that is over trees. If these conditions exist, consider the possibility of making the initial phase of the approach crosswind over the open area and then turning into the wind for the final portion of the approach.

Always operate the helicopter as close to its normal capabilities as possible, taking into consideration the situation at hand. In all confined area operations, with the exception of the pinnacle operation, the angle of descent should be no steeper than necessary to clear any barrier with the tail rotor in the approach path and still land on the selected spot. The angle of climb on takeoff should be normal, or not steeper than necessary to clear any barrier. Clearing a barrier by a few feet and maintaining normal operating rpm, with perhaps a reserve of power, is better than clearing a barrier by a wide margin but with a dangerously low rpm and no power reserve.

The descent is initiated when the approach angle is established, which crosses the landing point and the obstacle +100 feet. Considering a possible engine failure during the approach, the speed Vtoss (40 Kt for training) cannot be dropped without overcoming obstacles. If a go-around is to be decided, it must be before falling under the obstacles and losing the Vtoss speed. While passing obstacles, the current forward speed and sink rate are reduced, and the movement is terminated so that the ground speed above the landing point is zero.

Always make the landing to a specific point and not to some general area. This point should be located well forward, away from the approach end of the area. The more confined the area is, the more essential it is that the helicopter land precisely at a definite point. Keep this point in sight during the entire final approach. When flying a helicopter near obstacles, always consider the tail rotor. A safe angle of descent over barriers must be established to ensure tail rotor clearance of all obstructions. After coming to a hover, avoid turning the tail into obstructions.

Takeoff

A confined area takeoff is considered an altitude over airspeed maneuver where altitude gain is more important to airspeed gain. Before takeoff, make a reconnaissance from the ground or cockpit to determine the type of takeoff to be performed, to determine the point from which the takeoff should be initiated to ensure the maximum amount of available area, and finally, how to maneuver the helicopter best from the landing point to the proposed takeoff position.

If wind conditions and available area permit, the helicopter should be brought to a hover, turned around, and hovered forward from the landing position to the takeoff position. Under certain conditions, sideward flight to the takeoff position may be preferred, but rearward flight may be necessary, stopping often while moving to check on the location of obstacles relative to the tail rotor.

For take-off, the collective is applied continuously and smoothly, while the cyclic is given as far forward as necessary for passage over obstacles (from obstacle + 100 feet safe altitude). In the meantime, the engine and transmission clocks and RPM clocks are cross-checked, and the limits are followed. While passing the TDP, the cyclicity is advanced to reach the speed Vy and power is arranged to establish the desired climb rate.

When planning the takeoff, consider the direction of the wind, obstructions, and forced landing areas. To help fly up and over an obstacle, form an imaginary line from a point on the leading edge of the helicopter to the highest obstacle to be cleared. Fly this line of ascent with enough power to clear the obstacle by a safe distance. After clearing the obstacle, maintain the power setting and accelerate to the normal climb speed. Then, reduce power to the normal climb power setting.

COMMON ERRORS

1. Failure to perform, or improper performance of, a high or low reconnaissance.
2. Approach angle that is too steep or too shallow for the existing conditions.
3. Failing to maintain proper rpm.
4. Failure to consider emergency landing areas.
5. Failure to select a specific landing spot.
6. Failure to consider how wind and turbulence could affect the approach.
7. Improper takeoff and climb technique for existing conditions.
8. Failure to maintain safe clearance distance from obstructions.

PINNACLE AND RIDGELINE OPERATIONS

STANDARDLAR

1) Reconnaissance

- Maintain altitude ± 100 ft
- Entry Airspeed ± 10 Kt
- • Making a suitable reconnaissance
- Airspeed Vy 80Kt

2) Approach

- Maintaining the selected approach line and ground track.
- Establishing a fixed approach angle.
- Monitoring ground speed and descent rate.

3) Take Off

- Carrying out hover power checks, ground reconnaissance and before take off checks if necessary.
- Taxi to the departure point.
- Establishing take-off power without delay while maintaining heading within ±10°.
- Maintaining 65Kt ±10Kt.

DEFINITION

A pinnacle is an area from which the surface drops away steeply on all sides. A ridgeline is a long area from which the surface drops away steeply on one or two sides, such as a bluff or precipice. The absence of obstacles does not necessarily decrease the difficulty of pinnacle or ridgeline operations. Updrafts, downdrafts, and turbulence, together with unsuitable terrain in which to make a forced landing, may still present extreme hazards.

Approach and Landing

If there is a need to climb to a pinnacle or ridgeline, do it on the upwind side, when practicable, to take advantage of any updrafts. The approach flightpath should be parallel to the ridgeline and into the wind as much as possible.

When flying an approach to a pinnacle or ridgeline, avoid the areas where downdrafts are present, especially when excess power is limited. If downdrafts are encountered, it may become necessary to make an immediate turn away from the pinnacle to avoid being forced into the rising terrain.

Load, altitude, wind conditions, and terrain features determine the angle to use in the final part of an approach. As a general rule, the greater the winds are, the steeper the approach needs to be to avoid turbulent air and downdrafts.

Groundspeed during the approach is more difficult to judge because visual references are farther away than during approaches over trees or flat terrain. Pilots must continually perceive the apparent rate of closure by observing the apparent change in size of the landing zone features. Avoid the appearance of an increasing rate of closure to the landing site. The apparent rate of closure should be that of a brisk walk. If a crosswind exists, remain clear of down-drafts on the leeward or downwind side of the ridgeline. If the wind velocity makes the crosswind landing hazardous, it may be possible to make a low, coordinated turn into the wind just prior to terminating the approach. When making an approach to a pinnacle, avoid leeward turbulence and keep the helicopter within reach of a forced landing area as long as possible.

On landing, take advantage of the long axis of the area when wind conditions permit. Touchdown should be made in the forward portion of the area. When approaching to land on pinnacles, especially manmade areas such as rooftop pads, the pilot should determine the personnel access pathway to the helipad and ensure that the tail rotor is not allowed to intrude into that walkway or zone. Parking or landing with the tail rotor off the platform ensures personnel safety. Always perform a stability check prior to reducing rpm to ensure the landing gear is on firm terrain that can safely support the weight of the helicopter. Accomplish this by slowly moving the cyclic and pedals while lowering the collective. If movement is detected, reposition the aircraft.

Takeoff

A pinnacle takeoff is considered an airspeed over altitude maneuver which can be made from the ground or from a hover. Since pinnacles and ridgelines are generally higher than the immediate surrounding terrain, gaining airspeed on the takeoff is more important than gaining altitude. As airspeed increases, the departure from the pinnacle is more rapid and helicopter time in the “avoid” area of the height/velocity decreases. In addition to covering unfavorable terrain rapidly, a higher airspeed affords a more favorable glide angle and thus contributes to the chances of reaching a safe area in the event of a forced landing. If a suitable forced landing area is not available, a higher airspeed also permits a more effective flare prior to making an autorotative landing.

On takeoff, as the helicopter moves out of ground effect, maintain altitude and accelerate to normal climb airspeed. When normal climb speed is attained, establish a normal climb attitude. Never dive the helicopter down the slope after clearing the pinnacle.

NOTE: By evaluating performance, altitude, obstacle situation and environmental conditions, the take-off technique can be changed in the form of acceleration at constant altitude or to provide the safe take-off profile that the pilot deems appropriate.

When the speed Vy is reached, the cycle is applied backwards, and normal climbing principles are established.

COMMON ERRORS

1. Failing to perform, or improper performance of, a high or low reconnaissance.
2. Flying the approach angle too steep or too shallow for the existing conditions.
3. Failing to maintain proper rpm.
4. Failing to consider emergency landing areas.
5. Failing to consider how wind and turbulence could affect the approach and takeoff.
6. Failure to maintain pinnacle elevation after takeoff.
7. Failure to maintain proper approach rate of closure.
8. Failure to achieve climb airspeed in timely manner.

NOTE: *By evaluating performance, altitude, obstacle situation and environmental conditions, the take-off technique can be changed in the form of acceleration at constant altitude or to provide the safe take-off profile that the pilot deems appropriate.*

When the speed Vy is reached, the cycle is applied backwards, and normal climbing principles are established.

SLOPE OPERATIONS

STANDARDS

- Keeping the head direction perpendicular to the slope ± 5°
- The drift before touching the ground should not exceed 1 feet, there should be no drift after touching the ground,
- Soft, smooth and controlled descent and ground contact,
- Smooth and controlled vertical ascent.

DEFINITION

AW-139; **<u>RFM SECTION 1 LIMITATIONS Slope Landing/Take Off Limits:</u>**

- Nose Up, Nose Down, Left Down, Right Down : 5°

1. Taking Off from and landing on sloping ground merits extra consideration in the 139 because of the high nose-up hover attitude and the need for caution with regard to the risk of striking the tail boom.

2. The exercise can be carried out with equal facility in either the helicopter or the simulator.

3. From previous sorties and, as referred to in Chapter 5, Taking Off To The Hover, you will remember that the helicopter comes off the ground nose-wheel first and by a good margin. It is followed by the right or starboard main landing gear and then the left.

4. As it sits on the ground more or less level, there is quite an attitude change in coming up to the hover. And the tail boom lies almost parallel to the ground

Slope Landing

A pilot usually lands a helicopter across the slope rather than with the slope. Landing with the helicopter facing down the slope or downhill is not recommended because of the possibility of striking the tail rotor on the surface.

TECHNIQUE

At the termination of the approach, if necessary, move the helicopter slowly toward the slope, being careful not to turn the tail upslope. Position the helicopter across the slope at a stabilized hover headed into the wind over the intended landing spot. Downward pressure on the collective starts the helicopter descending. As the upslope skid touches the ground, hesitate momentarily in a level attitude, then apply slight lateral cyclic in the direction of the slope. This holds the skid against the slope while the pilot continues lowering the downslope skid with the collective. As the collective is lowered, continue to move the cyclic toward the slope to maintain a fixed position. The slope must be shallow enough to hold the helicopter against it with the cyclic during the entire landing. A slope of 5° is considered maximum for normal operation of most helicopters. Consult the RFM or POH for the specific limitations of the helicopter being flown.

Be aware of any abnormal vibration or mast bumping that signal maximum cyclic deflection. If this occurs, abandon the landing because the slope is too steep. In most helicopters with a counterclockwise rotor system, landings can be made on steeper slopes when holding the cyclic to the right. When landing on slopes using left cyclic, some cyclic input must be used to overcome the translating tendency. If wind is not a factor, consider the drifting tendency when determining landing direction.

After the downslope skid is on the surface, reduce the collective to full down, and neutralize the cyclic and pedals. Normal operating rpm should be maintained until the full weight of the helicopter is on the landing gear. This ensures adequate rpm for immediate takeoff in case the helicopter starts sliding down the slope. Use antitorque pedals as necessary throughout the landing for heading control. Before reducing the rpm, move the cyclic control as necessary to check that the helicopter is firmly on the ground.

Landing: Autopilot and SAS are deactivated before starting the slope work. The slope landing area is approached at an angle between 45° and 90°. A stable stance is ensured with the wheels perpendicular to the slope. The tail of the helicopter is not moved up the slope. Good pedal control is essential for the safety of the descent. Stand on a fixed floor 3 feet above the landing place. Most of the attention is given to the front and outside of the helicopter. The collective is started to decrease, allowing the helicopter to slowly collapse, and the helicopter's horizon is maintained. While the wheel on the upper side of the slope touches the ground, the necessary controls are given to prevent the helicopter from tipping down the slope, and the horizon is provided on the horizontal axis by looking over the maroon panel. In the meantime, maximum attention is paid to the pedal trim. Without giving a deep command and using the beep trim on the cyclic, the collective is pressed down to maintain the horizon while simultaneously opening the cyclic uphill with reference from the top of the claret red panel. It should not be forgotten that if the cyclic slope approaches the limits during the descent phase, the slope of the slope is high and there may be a limit exceedance. Depending on the slope of the slope, the cyclic slope is opened up enough and after the appropriate mast slope is provided, the collective is held down for a soft contact of the downhill sled to the ground and the descent is completed in this way.

If the correct cyclic trim is done, there will be no need for additional beep trim when the downhill wheel is touching the ground. However, if the cyclic trim is not sufficient, enough cyclicity can be opened up the slope to prevent tipping down the slope while sitting on the ground. After making sure that the wheels are fully seated on the floor, the collective is pressed down softly. Cycles and pedals are centered.

CAUTION

Following a slope landing, the parking brake holding capability is guarantee for 2 minutes from rotor stop.

Be aware of dynamic rollover on slopes

COMMON ERRORS

1. Failing to consider wind effects during the approach and landing.
2. Failing to maintain proper rpm throughout the entire maneuver.
3. Failure to maintain heading resulting in a turning or pivoting motion.
4. Turning the tail of the helicopter into the slope.
5. Lowering the downslope skid or wheel too rapidly.
6. Applying excessive cyclic control into the slope, causing mast bumping.

Slope Takeoff

A slope takeoff is basically the reverse of a slope landing. Conditions that may be associated with the slope, such as turbulence and obstacles, must be considered during the takeoff. Planning should include suitable forced landing areas.

TECHNIQUE

Begin the takeoff by increasing rpm to the normal range with the collective full down. Then, move the cyclic toward the slope. Holding the cyclic toward the direction of the slope causes the downslope skid to rise as the pilot slowly raises the collective. As the skid comes up, move the cyclic as necessary to maintain a level attitude in relation to the horizon. If properly coordinated, the helicopter should attain a level attitude as the cyclic reaches the neutral position. At the same time, use antitorque pedal pressure to maintain heading and throttle to maintain rpm. With the helicopter level and the cyclic centered, pause momentarily to verify everything is correct, and then gradually raise the collective to complete the liftoff. After reaching a hover, avoid hitting the ground with the tail rotor by not turning the helicopter tail upslope and gaining enough altitude to ensure the tail rotor is clear. If an upslope wind exists, execute a crosswind takeoff and then make a turn into the wind after clearing the ground with the tail rotor.

Take-off: The take-off from the slope to the nook is almost the same way of landing on the slope, but in the opposite direction. First, it is applied upwards until the collective attenuation state, while the cyclicity opens up sufficiently. When the attenuation condition is achieved, the current drifts and deviations in the head direction are eliminated, and at this point, the downhill skit is cut off the ground with a small upward collective application. The claret panel is applied collectively upwards until its upper part is parallel to the ground, and the direction is maintained with the pedals. Once the horizon has been achieved, the slope is cyclical down and the collective is kept full up enough to maintain the horizon. When the pall plane is in the horizontal position, the collective is applied upwards and the wheel is cut off from the ground, the movement is completed with a vertical movement. When leaving the slope, the tail should never be turned up the slope, the slope area should be left parallel to the slope.

COMMON ERRORS

1. Failing to adjust cyclic control to keep the helicopter from sliding down slope.
2. Failing to maintain proper rpm.
3. Holding excessive cyclic into the slope as the down slope skid is raised.
4. Failure to maintain heading, resulting in a turning or pivoting motion.
5. Turning the tail of the helicopter into the slope during takeoff.

AIRMANSHIP

The main airmanship points of this exercise are:

a. Lookout

b. Monitor Fuel and Engine Instruments

c. Monitor Wind velocity

d. Careful assessment of the surface

DEMONSTRATION OF Vh AND Vne SPEED

STANDARDS

- Keeping selected Altitude constant (Only for Vh)
- Establishing maximum continuous power (69% Torque)
- Correctly aircraft limitations.
- Heading ± 10°.
- Speed + 0 KIAS – 10 KIAS.

DEFINITION

Vh Speed (Maximum horizontal speed)

This speed refers to the maximum speed that the helicopter can fly at constant altitude using the maximum continuous torque value. Before starting this movement, if the helicopter has an autopilot, a fixed altitude, and a fixed heading (heading) are set to be kept by the autopilot. The collective is applied slowly up to the maximum sustained torque, while cyclic forward enough to keep the altitude constant. This coordinated motion continues until maximum torque is applied. When this torque value is reached, the speed is adjusted so that the altitude remains constant, and the conditions are stabilized by flying in this position for a short time. The Vh value is determined by saying the value read out loud on the airspeed indicator.

Vne Speed

This speed refers to the speed that should never be exceeded. The Vne value is determined by looking at the helicopter's Flight Manual or the Speed Limit Cards on the top of the helicopter's instrument panel. In training, Vne speed is also shown by making the necessary adjustments immediately after the Vh speed is shown. After the Vh speed is detected, altitude mode is deactivated if altitude is being held by autopilot. While maintaining the maximum continuous torque value or a torque value below it with the collective, the cyclic is slowly applied forward to reach the determined speed Vne. In the meantime, the helicopter is allowed to give altitude. When the speed Vne is seen on the speedometer, the speed is reduced without delay, while the collective is applied low enough to prevent the helicopter climbing. The flight continues at the desired speed and altitude.

1. This exercise demonstrates the maneuverability of the aircraft at high speed and has useful but rather limited operational applications. Incursions into the upper limits of the flight envelope, when entered smoothly, provide a ‘feel’ for the aircraft which helps to instill confidence in its capabilities. However, the aerodynamic stresses to which the airframe and rotor system are exposed during flight at or near VNE are high.

2. Out of the training environment emphasis should be placed on early recognition when nearing VNE and avoidance of exceedingly rather than practicing flight at VNE. Nevertheless, it is useful for you to experience flight at VNE and practice the correct recovery techniques.

TECHNIQUE

CARRY OUT FLIGHT AT HIGH SPEED, VNE

1. VNE may be encountered in situations such as fast descent, unusual attitudes, etc. VNE varies with Gross Weight, PA, and OAT and the graphs associated with calculating the VNE before flight are located in the RFM. (168 KIAS up to 6000ft DA)

2. From level flight at 2000ft AGL or more increase and set PI at 90% (ensure that the ITT and NG remain within limits) and allow the speed to increase up to VMax, (Maximum speed straight and level). Once stabilized, adopt a 5° nose down attitude using the cyclic beep trim. The aircraft will gradually reach VNE. Take care not to exceed PI or VNE limitations. Turn co-ordination will maintain balance during the dive.

3. Recover when approaching VNE by smoothly trimming the cyclic beep trim to select approximately 0° pitch and simultaneously engaging the FTR on the collective and reduce power gently to cruise power.

AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Lookout below the aircraft.

b. Monitor fuel and engine instruments limitations.

c. Monitor the wind velocity.

d. Choose a clear descent path.

e. Carry out all the relevant checks airmanship.

NOTES FOR THE STUDENT

1. Conduct a lookout below the aircraft to ensure that the descent path is clear.

2. Try not to monitor the instruments too closely to the detriment of lookout.

3. Applying the cyclic positively enough to reach the required limit.

4. Remember to use an external heading marker to avoid the need to concentrate on the direction of the aircraft.

STEEP TURNS

STANDARDS

- Altitude: ± 200 feet
- Roll Out Heading: ± 10º
- Airspeed: 100Kt ±10 Kt
- Bank Angle: 60º ±5º
- Ground Level+1000 feet or more.

DEFINITION

Before starting the maneuver, you should be at least 1000 feet above the ground and the ground track should be determined by choosing landmarks in the direction. The turns are made in the form of 360º rotations from the right or left. It should not be forgotten that the helicopter will tend to give more altitude when turning from the left compared to the turning from the right.

After constant altitude, ground track and speed (100kt.) are provided, the cleanliness control of the direction to which the turn will be made is made.

1. The principle for turns is as you have utilized before (i.e. bank/balance/power). It is important that attitude is maintained from the initial application of 'bank' and that no attempt is made to chase minor speed changes.

As the turn is established, altitude is controlled with collective. If the aircraft attitude changes due to collective input, re-gain the required attitude with the cyclic.

2. There are 3 methods of turning the aircraft onto specified heading. They all have their advantages and adapting which method is best for the situation will be clear once they have been practiced. The methods are:

   a. Against force spring pressure.

   b. Engaging the FTR and releasing at the desired AOB.

   c. Using the beep trim on the cyclic.

TURN ONTO NEW HEADING USING A STEEP TURN WHILST IN LEVEL FLIGHT

1. Steep angle of bank will be over 30°. For training VFR, Steep Turns will be performed at 45° angle of bank.

2. Turning against spring pressure. This is more difficult to sustain and conduct accurately. Use the visual horizon to judge the AOB but beware, it is easy to roll beyond the intended AOB. As you roll through 30° engage the collective FTR and increase power to maintain height (approx. 5-10% PI). Check the Tq limits. Try not to pull back on the cyclic to maintain the height during the turn as this will reduce speed. If during the maneuver VSI displays a ROD > 500ft/min then roll off the angle of bank and adopt wings level attitude and start the maneuver again. On rolling out remember to take off any power that you may have applied as you pass back through 30°.

3. Turning using the cyclic beep trim. As per the standard and medium turn, however, a larger amount of collective power will be needed to maintain height. It has the same advantages and disadvantages as the standard turn.

4. Turn using the FTR. Use the horizon and the disc attitude to visually judge 45° and confirm with the roll indicator. As you pass through 30° raise the collective and apply power to prevent any ROD. Check the PI limits. Release the cyclic FT at 45°. Make any adjustments to pitch using the cyclic beep trim, allow the corrections to settle and then check the VSI, and if required adjust the power to maintain height. On rolling out remember to take off any power that you may have applied as you roll back through 30°. It has the same advantages and disadvantages as the standard turn.

AIRMANSHIP

1. The main airmanship points of this exercise are:

   a. Lookout in the direction of turn.
   b. Monitor fuel and engine instruments.
   c. Tq awareness during Steep Turns

NOTES FOR THE STUDENT

1. It is important to maintain eyes out during the turn and not to fly on instruments. The angle of bank should be judged visually by using the attitude of the disc and the angle it cuts on the horizon backed up and confirmed by the roll indicator on the PFD.

2. Monitor the automation being used and ensure the aircraft is flying the expected flight profile.

3. Maintain lookout and SA whilst turning especially with regards to other aircraft

COMMON ERRORS

- Not being able to maintain a stable bank angle,
- Allowing deep altitude loss.
- Not being able to prevent the speed increase.
- Being late at the exit.

FUEL FLOW CONTROL

STANDARDS

- Comparison of the fuel at departure time with the total fuel required.
- Fuel consumption control at 15-30 minutes following the first reading 10 minutes after switching to level flight or entering operation conditions.
- If actual fuel consumption varies from planned values and the flight cannot be completed with the required reserve fuel, implementation of the reserve course of action.
- Frequent checking of fuel amount and fuel consumption throughout the flight.

DEFINITION

- Fuel Check Before Takeoff: The total fuel in the tank is determined. It is compared to the required fuel calculated in pre-flight planning. If the fuel is insufficient, the helicopter is refueled.
- Initial Air-Fuel Check: After the helicopter is leveled and the appropriate power settings, the total amount of fuel and the reading time are recorded.
- Fuel Consumption Check: 10 min. after the helicopter is at the operation flight altitude time and the remaining fuel are recorded. The remaining fuel is checked and noted in 15-30 minutes. Fuel consumption rate, end and reserve fuel start time are calculated and recorded. Considering the reserve fuel required, it is decided whether the remaining fuel is sufficient to complete the mission. If the amount of fuel is insufficient, the backup course of action is applied.
- Fuel Amount and Expenditure: The amount of fuel and expenditure rate are periodically checked. If the fuel quantity and flow deviate from the calculated values, the fuel flow calculation is repeated to determine if the fuel is sufficient to complete the flight.

IFR FLIGHT MANEUVERS

INSTRUMENT TAKE OFF

STANDARDS

- Correctly IAW aircraft limitations.
- Heading ± 10°.
- Speed ± 10kts.
- Height ± 100ft.

DEFINITION

Generally the initial instrument take off with the 139 does not differ from any other aircraft in that there must be a careful and controlled transition from visual references to instrument references. An operational IFR departure would be expected to be in accordance with the CAT A Clear Area profile until TDP and Vtoss at which time the pilot converts their full attention onto instruments. This scenario can be easily created in the Simulator whereas in the helicopter, the take-off will have to practiced in VMC with the student pilot using "Foggles" to limit or restrict any view to the outside and needing to be "on instruments" from the hover.

TECHNIQUE

PREPARING FOR THE ITO

1. The A/C will have been hover-taxied to the departure point, before take-off checks and instruments checked and the safety pilot (Instructor) will carry out the lookout turn and departure R/T call. You will follow through on the controls then call '3,2,1, I have control'.

2. Apply power to reach the Target PI and simultaneously rotate the nose to the desired attitude. The helicopter will start accelerating and climbing.

3. During the initial climb out, heading should initially be maintained with the pedals. Above 40-45 knots, the High Speed Turn Co-ordination function becomes active and it will be sufficient to lightly cover the pedals without imparting any control input. Nonetheless, throughout the instrument take-off, instrument scanning and cross-checking must be rapid and accurate, and any necessary control inputs should be positive and smooth.

4. You must monitor the VSI to establish and maintain a positive rate of climb of at least 500fpm. Be alert to the need to overcome the effects of disc flapback which may not be entirely controlled by the attitude retention and maintain the required accelerative attitude.

At 200ft and with a positive rate of climb conduct the after take-off checks.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Radio Checks.

b. Flight instrument checks in the hover-taxi.

c. Fuel and engine instruments checks.

d. Awareness of the W/V.

e. Crew briefing.

f. Understanding of ATC procedures.

g. Monitor fuel and engine instruments.

h. Monitor the wind velocity.

COMMON ERRORS

1. Cross checking the primary HSI during the take-off is important to maintain the heading.

2. Try not to over control with pedals and cover them lightly once above 40-45 knots.

3. Make sure you use enough power to initiate the take-off Hover PWR + 15%.

4. Don't forget to adjust pitch as climbing airspeed is reached.

STRAIGHT AND LEVEL FLIGHT

STANDARDS

Correctly IAW aircraft limitations.

Heading ± 10°.

Speed ± 10kts.

Height ± 100ft.

Maintaining aircraft in balance.

DEFINITION

Carry out level flight at a given height by day in simulated or real IMC into or out of wind on a specified heading

TECHNIQUE

USE OF ATTITUDE INDICATOR

1. Because of the layout of the flat screen display with a lot of other parameters presented in one place, it is important to learn to focus only on that which is needed. The EADI portion of the screen is nonetheless large with clear markings on the Attitude Pitch Tape compared to traditional instruments. Changes in pitch attitude can be more precisely made with a consequent improvement in the potential accuracy of speed changes. As with any aircraft display, pilots should strive to develop an eye for finer adjustment with a view to making accurate pitch changes. In addition, the full value of using the trim system to best advantage can be realised.

3. Changes in the rolling plane are directly related to aircraft angle of bank and this may accurately be assessed by checking the position of the Attitude Roll Pointer against the scale provided around the top half of the instrument. The angle of bank scale is of particular value while setting up turns at various airspeeds.

STRAIGHT and LEVEL ATTITUDE INDICATIONS

1. Flying straight and level on instruments is much the same as for visual flight. When a particular speed is required this will be adjusted with reference to attitude while applying sufficient power to maintain height/altitude.

2. SCAN: Check correct pitch attitude (AI). Check correct power (PI). Check height/altitude/flight level (VSI and altimeter).

MAINTAINING HEADING

1. As the AW139 returns itself to wings level from 3 degrees of bank either left or right, the traditional problem of inexperienced pilots allowing a small departure from wings level to turn into a significant heading change is mitigated but does not relieve the pilot of the need to maintain a good scan.

SCAN: Check lateral level (AI), Check heading (HSI).

MAINTAINING BALANCED FLIGHT

1. A common fault among pilots who experience difficulty in relaxing while on instruments is to fly with 'crossed controls', e.g. the left wing has gone down a few degrees, a turn is indicated to the left and heading starts to decrease. This problem is mitigated in the AW139 by the of Attitude Retention and the Yaw Control functions.

2. In cruise flight, the feet should cover the pedals but without imparting any control input to allow the system to operate unhindered.

SCAN: Check lateral level (AI). Check balance (Slip/Skid Indicator) and if necessary centre it by applying pedal in the direction of displacement, e.g. indicator to the left of centre – LEFT pedal. Check heading (DI).

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Monitor fuel and engine instruments.

b. Monitor the wind velocity.

COMMON ERRORS

1. In order to maintain accuracy it is important not to focus on a single parameter but to maintain the selective radial scan switching focus from the main AI out to an individual instrument parameter and always back to the main AI.

SPEED CHANGES IN LEVEL FLIGHT

STANDARDS

Correctly IAW aircraft limitations.

Heading ± 10°.

Speed ± 10kts.

Height ± 100ft.

DEFINITION

1. The altimeter is the primary pitch instrument during level flight, whether flying at a constant airspeed or during a change in airspeed. Altitude should not change during airspeed transitions, and the heading indicator remains the primary bank instrument.

2. Whenever the airspeed is changed by an appreciable amount, the PI briefly becomes the primary reference for power control. When the airspeed approaches the desired reading, the airspeed indicator then becomes the primary instrument for power control.

TECHNIQUE

REDUCING SPEED

1. Starting from a nominated speed 120 KIAS reduce the speed by adjusting the pitch attitude and simultaneously lower the collective to maintain height. Scan the VSI during this manoeuvre as it is the most sensitive to changes in altitude. Monitor the Slip/Skid Indicator to ensure the system is keeping the aircraft in trim. When the speed approaches the desired IAS adjust the pitch attitude and increase the power to the new PI setting for that speed. Check that balance is being maintained as you increase power.

INCREASING SPEED

1. Starting from a nominated speed 80 KIAS Increase the speed by adjusting the pitch attitude and simultaneously raising the collective to maintain height. Again, scan the VSI during this manoeuvre as it is the most sensitive to changes in altitude. Check that the aircraft remains in balance as you increase power. When the speed approaches the desired IAS adjust the pitch attitude and decrease the power to the new PI setting for that speed. Check that balance is being maintained as you decrease power.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Monitor fuel and engine instruments.

b. Aircraft Limitations.

COMMON ERRORS

1. Don’t try to rush the speed changes, causing the aircraft to climb or descend.

2. Ensure that you scan the primary HSI during the power changes otherwise it may cause large heading variations.

3. A good and fast scan is needed, don’t focus solely on the main attitude indicator and on the pitch change required to adjust speed to the detriment of other parameters, most commonly the heading.

4. The balance is significantly affected by the changes in power so regularly monitor the Slip/Skid Indicator to ensure the aircraft is staying trimmed and in balance.

ALTITUDE CHANGES – CLIMB AND DESCEND

STANDARDS

Correctly IAW aircraft limitations.

Heading ± 10°.

Speed ± 10kts.

Height ± 100ft.

Maintaining aircraft in balance.

DEFINITION

As previously mentioned, the transition from straight and level flight to the climb or descent must be made gradually. The effects on trim (if applicable) and balance of power changes should be anticipated and monitored during the following sequence of events:

TECHNIQUE

CLIMBING AND DESCENDING AT A CONSTANT AIRSPEED

FROM STRAIGHT AND LEVEL FLIGHT TO THE CLIMB

1. Apply collective to the required climb power. Check any tendency to yaw and keep the wings level.

2. Maintain the desired aircraft pitch attitude, trimming if necessary.

3. Check the VSI and increase the power to achieve the desired ROC

FROM THE CLIMB TO STRAIGHT AND LEVEL FLIGHT

1. At the desired height slowly adjust the power anticipating by 100ft of the level off height. Monitor pitch attitude to maintain the selected speed.

2. If applicable re-trim, check heading, speed and power setting.

Use the selective radial scan. SCAN:

Check wings level and on the horizon (Attitude Indicator), altitude correct and steady (Altimeter and VSI), balance (Slip/Skid Indicator) and heading (primary HSI). Check airspeed and power setting.

FROM STRAIGHT AND LEVEL FLIGHT TO THE DESCENT:

1. As above, but lower the collective.

CLIMBING AND DESCENDING CHANGING THE AIRSPEED

From straight and level flight to the climb

1. Apply collective to the correct climbing power. Check any tendency to yaw and ensure the wings are kept level.

2. Adopt the required decelerative attitude. Hold the new attitude and if necessary re-trim.

3. Allow time for the airspeed to settle, then make fine adjustments to attitude as required until the correct speed is attained.

FROM THE CLIMB TO STRAIGHT AND LEVEL FLIGHT

1. At the correct height slowly lower the nose and allow the airspeed to increase while maintaining the new altitude. Do not reduce power at this stage and check the aircraft is staying in balance.

2. Keep the wings level and as the ASI moves towards the correct speed reduce collective to cruising power.

3. Re-trim as necessary, check heading, speed and power setting, remembering that changes in airspeed will affect the attitude.

FROM STRAIGHT AND LEVEL FLIGHT TO THE DESCENT

1. Reduce collective to the power known to give the required rate of descent, at the same time checking the wings are staying level and the aircraft remains in balance.

2. Check the rate of descent on the VSI. If it is too high add a little power and check the attitude stays the same. If the descent rate is insufficient reduce power slightly and re-trim as necessary.

CONSTANT RATE OF DESCENT TO GIVEN ALTITUDE

1. Commence a descent as previously described and attain the required rate of descent by adjusting the power. Allow time for the VSI to settle. If the rate is too high apply collective slightly. When the rate is not fast enough reduce power a little. While making these adjustments check that the airspeed is remaining constant.

2. Anticipate the new height/altitude by 100-150ft, then progressively add power.

3. As the speed increases gradually raise the nose and stop the descent. Check that the wings are level and the aircraft is in balance.

4. Allow the airspeed to settle to the required figure, check that height is being maintained and if necessary adjust power/attitude to achieve this.

5. Re-trim and make fine adjustments to the power setting as necessary.

CONSTANT RATE OF CLIMB TO GIVEN ALTITUDES

1. As above but increase power.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Monitor fuel and engine instruments.

b. Aircraft Limitations.

COMMON ERRORS

1. As noted during the explanations above, balance is significantly affected by the changes in power required for climbing and descending. The trim system will ordinarily maintain the aircraft in balance without any control input from the pilot via the yaw pedals but it will be prudent to continue to cover the pedals and to remain vigilant in monitoring the Slip/Skid Indicator during all manoeuvres but especially during those requiring larger power changes.

TURNS

STANDARDS

Correctly IAW aircraft

limitations.

Heading ± 10°.

Speed ± 10kts.

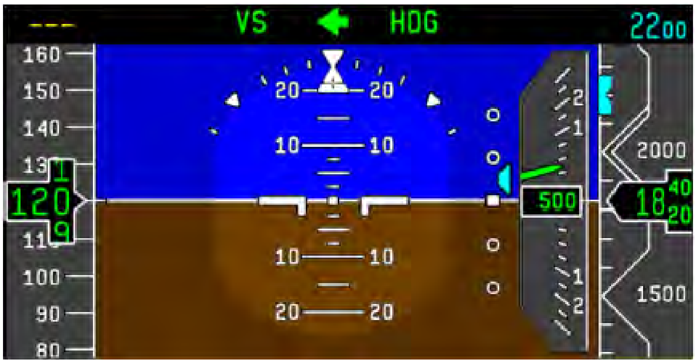
Height ± 100ft.

Maintaining aircraft in balance

DEFINITION

1. Turns, forming part of instrument procedures are flown at Rate 1 or less and a Rate 1 turn has become known as the Standard Rate Turn.

2. The Rate 1 turn entails changing heading at the rate of 3° per second. Thus, a reversal of direction through 180° will take one minute and two minutes are required to fly through 360°. The term 2-minute Turn is sometimes used.



3. The AW139 does not have a separate Turn Co-ordinator. When flying manually, turn coordination is maintained as part of the Yaw Control function which engages automatically when either autopilot is engaged and when ATT or SAS mode are active. When coupled, the Flight Director will automatically produce a Rate 1 or Standard Turn. However, when flying manually, the pilot will have to determine the angle of bank appropriate to the selected airspeed.

4. Bank angle is a function of airspeed and the following method of determining bank angle will prove sufficiently accurate for practical purposes:

Use the formula:

Speed divided by 10 + half the A/S

Example at 120Kts = 120/10 = 12 + half A/S = 12+6 Rate 1 turn = 18 Degrees

Or for ease in high workload situations:

Speed divided by 10 + 7

Example at 120Kts = 120/10 = 12 + 7 = 12+7 Rate 1 turn = 19 Degrees

The latter gives you a calculation of accuracy to within 5%

5. There are different trim techniques for conducting turns in the AW139 and, while each of them will be practiced during training, remember the aircraft is designed to be flown using the trim system and use of the beep trim is the preferred method. Your instructor will outline the practical application of the different techniques in detail.

a. Fly “against the springs”

b. Use the beep trim only

c. Use the force trim only

As turn co-ordination is controlled by the aircraft itself, pilot scanning during turns can be focused upon maintaining the correct angle of bank, keeping the selected speed and maintaining the assigned altitude.

6. Turning at various angle of bank:

There are occasions when turns of less than Standard Rate are an advantage during instrument procedures. For example, there may be a need to compensate for drift by turning at Rate ½ while closing with a new heading. Obviously, a Rate ½ turn will require less bank than a Rate 1 and a small re-calculation of the angle of bank would be necessary.

In general, turns at rates greater than Rate 1 are not used during instrument procedures.

7. Turns onto Selected Headings:

In order to turn accurately onto a selected new heading, the roll-out will need to be commenced in sufficient time before the heading reaches the top of the primary HSI to avoid going past it.

If the transition from turning to wings level is made correctly 5-8 seconds will elapse during the process according to bank angle. It therefore follows that the roll-out should start some 10-15° before the new heading has been reached. With practice it is possible to arrive at the wings-level attitude as the new heading appears on the DI.

8. Timed Turn:

Although bank angle confirmed by the turn needle will allow the pilot to fly a Rate ½ or rate 1 turn with a reasonable degree of accuracy, for complete precision the stopwatch must be introduced.

TECHNIQUE

TURN IN LEVEL FLIGHT

From straight and level at specified airspeed, roll on bank commensurate with rate of turn required.

a. Maintain height and airspeed and monitor the aircraft balance.

b. Scan the instruments, Attitude Indicator for angle of bank and pitch, HSI for heading information, VSI for any trend away from level light, Slip/Skid Indicator during the turn.

c. Roll out onto specified heading anticipating by at least 10°

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Monitor fuel and engine instruments.

b. Aircraft Limitations.

COMMON ERRORS

1. A small amount of power may be required to maintain height during the turn.

2. When conducting turns the aircraft should maintain the pitch attitude. However, there may be a need to use a small amount of cyclic back pressure to help maintain the attitude and therefore the speed.

3. The introduction of another instrument may at first appear to complicate the scanning process but practice will develop the ability to divide attention between the essential instruments while disregarding the inessential.

CLIMBING AND DESCENDING TURNS

STANDARDS

Correctly IAW aircraft limitations.

Heading ± 10°.

Speed ± 10kts.

Height ± 100ft.

DEFINITION

1. Climbing and descending turns on instruments are handled in much the same manner as in visual flight but the combination of changes in heading at the same time as alterations in height/altitude entails devoting more attention to the VSI during the scan.

2. Climbing turns are used in most instrument procedures and both exercises are worthy of practice as a mean of building up confidence and improving instrument flying skill.

TECHNIQUE

CLIMBING AND DESCENDING TURNS

1. The sequence for a climbing coordinated turn (500ft/min) is as follows:

a. Start from 90kts S & L, cruise power set.

b. Apply power to generate 500ft/min ROC, remaining at 90kts.

c. As VSI starts to indicate, passing through 200fppm, apply 15° AOB for a R1 turn.

d. Adjust ROC accordingly to achieve the correct altitude at ¼, ½ and ¾ positions, around the turn whilst maintaining the AoB.

e. Anticipate level off and roll out to achieve the co-ordination.

2. The sequence for a descending coordinated turn (500ft/min) is as follows:

a. Start from 90kts S & L, cruise power set.

b. Reduce power to generate 500ft/min ROD, maintain 90kts.

c. As VSI starts to indicate, apply 15° AoB for a Rate 1 turn.

d. Adjust ROD accordingly to achieve the correct altitude at ¼, ½ and ¾ positions, around the turn whilst maintaining the AoB.

3. SCAN: Attitude Indicator for angle of bank and pitch, ASI for airspeed, HSI for heading information, VSI for rate of climb or descent, Slip/Skid Indicator to ensure the aircraft stays in balance during the turn.

4. Monitor the progress of the turn and start the roll-out 10°-15° before the new heading appears at the top of the HSI.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Monitor fuel and engine instruments.

b. Aircraft Limitations.

COMMON ERRORS

1. Identify the power required to maintain the ROC/ROD don’t focus too much on the AOB, maintain a good scan.

2. Try not to allow the speed to reduce or increase during the climb/descent.

DESCENT IN AUTOROTATION AND POWER RECOVERY

STANDARDS

Correctly IAW aircraft limitations.

Heading ± 10°.

Speed ± 10kts.

Height ± 100ft.

Maintaining aircraft in balance.

DEFINITION

1. IMC Emergencies are dealt with in exactly the same way as when VMC in terms of use or checklist etc. However, the added workload of flying on instruments, coupled with the problems of descending below Safety Altitude whilst in cloud add further complications to many emergency drills. In order to achieve safe flight, consideration should be given to initiating a descent to Safety Altitude in order to either speed up the recovery process or maybe to become VMC. As usual, the way in which you deal with an emergency will depend upon the urgency of the need to land.

Minimum safe altitude(MSA) is a concept used in planning and executing aircraft flights. MSFL (minimum safe flight level) can also be used.

1. MSA is an altitude which allows adequate vertical clearance from nearby terrain and manmade obstacles, and allows proper navigational functions. This needs to be known before fight in order that you know the attitude which you can safely make an emergency descent, and for the purpose of this exercise.

2. During a real emergency autorotation there should be no turning below MSA (you are getting too close to the ground and the focus should be to monitor inside and outside the cockpit to try to find a cloud break or ground reference).

TECHNIQUE

AUTOROTATION WITH POWERED RECOVERY

1. From a suitable altitude, decided by your instructor (4000ft amsl, for example), enter autorotation smoothly, maintaining balance with what will certainly be a large amount of right pedal. As well as the instrument scan, maintain NR in the needle-split range.

2. During the descent the objective will be to decelerate to the target autorotation speed of 80 KIAS and carry out some turns as instructed or simply turning to the last known wind.

3. Approaching MSA or pre-determined altitude, increase power maintain the attitude and balance and recover the aircraft to straight and level flight, check engine response, temperatures and pressures and then climb at Vy (80 KIAS) back above MSA.

AUTOROTATION FOLLOWING DOUBLE ENGINE FAILURE (SIMULATOR)

1. In the simulator, your instructor will be able to develop your skills and confidence towards responding to full engine failures in IMC. This situation will obviously require a much more urgent response to establish the autorotative descent with Nr safely under control while still maintaining the aircraft in stable flight by sole reference to the instruments.

2. This training exercise will be carried out overhead or near enough the reference aerodrome so that a cloud break can be obtained and a landing achieved somewhere within the confines of the aerodrome.

3. The objective will always be to decelerate to 80 KIAS, and make any turn necessary to reach a suitable position overhead the airfield.

4. Upon reaching the landing area, the flare and landing will be carried out in the same way as for the same manoeuvre in VMC training.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

f. Engine checks pre-autorotation

g. Aircraft Limitations.

h. Wind awareness

i. For real emergency (i.e. in cloud) it is important to know your geographical location and actual cloud base at all times during IFR

COMMON ERRORS

1. When lowering the collective, do so gradually but keep lowering it until the NR starts to increase.

2. Maintain balance control when lowering the collective.

3. Monitor the altitude during the descent.

4. Don’t over control the aircraft especially the collective, it will result in fluctuating NR.

RECOVERY FROM UNUSUAL ATTITUDE

STANDARDS

Prompt appropriate recovery action with minimal height loss.

DEFINITION

During Instrument flying you must trust the instrument indications. Disregard any physiological sensations as they may well be giving you false information. Disbelief of the instruments can aggravate these sensations leading to disorientation or the ‘leans’. This can result in the aircraft entering an unusual attitude.

TECHNIQUE

RECOVERY FROM AN UNUSUAL ATTITUDE (UA)

1. Your instructor will carry out some checks and then demonstrate these problems by manoeuvring the aircraft into an unusual position while you close your eyes or look away from the instruments. When you are given control the objective is to quickly but correctly interpret the information presented by the instruments and smoothly regain parameters.

2. Recovery Action: To recover don’t try to do too many things at once. The correct initial actions, in order of priority are:

a. Refer to the attitude indicator and level the wings, calling “wings level”. Cross refer to the standby instrument (ESIS).

b. Check the aircraft is in balance and make any necessary pedal input. Keep in mind that during any manoeuvres involving more extreme aircraft movement or larger control inputs, the Yaw Control and High Speed Turn Co-ordination may not be able to keep up.

c. Check ASI and VSI:

d. If airspeed low (below 40kts), maintain the collective lever position but select an accelerative attitude. On reaching 40kts, select a speed stable attitude and apply 75% power. Once a positive rate of climb is indicated, a gentle accelerative attitude may be adopted to achieve the full climb parameters. Be alert to the dangers of entering Vortex Ring State if the speed gets too low.

e. If the airspeed is high, select a decelerative attitude and adjust power as necessary. Avoid harsh cyclic movements to prevent a large increase in NR and, near VNE, to reduce the chance of jackstall.

f. Smoothly adjust attitude and power to achieve a climb at Vy if the UA was a descending manoeuvre, or to straight and level if it was a climbing manoeuvre. For exercise purposes, once you have re-established at the original parameters, including last heading, you should indicate to the Instructor that you have completed recovery action by calling out the A/C heading and altitude passing (or level at).

g. After the recovery is complete subsequent actions are a matter of airmanship, e.g. climbing to a previously allocated altitude, or flying a missed approach procedure into a further let-down pattern.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Aircraft Limitations.

b. Wind awareness

COMMON ERRORS

1. Don’t focus for too long on one aspect of the unusual attitude at a time. For example you may spend too long trying to get the wings exactly level before properly adjusting, power settings or stopping a descent.

RADIO/EN ROUTE NAVIGATION: NDB, VOR, FMS

STANDARDS

Heading to be maintained ± 10°.

Speed to be maintained ±10kts.

Height to be maintained ± 100ft.

Maintaining aircraft in balance.

DEFINITION

1. You will remember from basic instrument training that the simplest form of radio navigation involves flying a direct track between a succession of VOR or NDB stations which lie on or close to the desired en route track. Additional turning points can be identified by bearing and distance from one or more beacons.

2. In the AW139, the FMS effectively takes over this duty and, instead of tuning and identifying a sequence of radio aids and determining where additional intersections are, the pilot can simply enter his required route as a sequence of waypoints made up of the known locations of the same beacons and intersections already stored on the Navigation Database. In addition, Standard Instrument Departures (SIDs) and Standard Arrivals

(STARs) can be loaded in their entirety as a sequence of saved waypoints in the database. The resulting flight plan route will then be displayed on the Map or Plan page of the MFD. The Flight Director can then be coupled to the FMS and the sequence of waypoints followed to the end of the loaded flight plan.

3. Of course, the basics of procedural instrument flying remain just the same. As well as the facilities afforded by the FMS, the AW139 still carries the normal fit of VOR/LOC, DME and ADF. From a training point of view, you must still learn to control the aircraft, manually as well as coupled while sometimes using the minimum available navigation aids during all phases of instrument flight.

4. The FMS basic functions, creating and closing a flight plan route and coupling the Flight Director, will be familiar to you from VFR training. The notes below provide a short reminder of the basic navigation aids which may not yet have been discussed.

(a) VOR - indicates the magnetic bearing from the station to the aircraft (the Radial). The Course Deviation Indicator (CDI) indicates the aircraft's position relative to the radial the pilot has selected and requires careful interpretation.

(b) ADF - (Automatic Direction Finding) indicates relative bearing to a radio beacon, called an NDB (Non-Directional Beacon)

(c) DME - (Distance Measuring Equipment) indicates the distance in nautical miles from the beacon to the aircraft. VOR and DME stations are often co-located and with the same published frequency.

TECHNIQUE

IN FLIGHT NAVIGATION

Even where complete procedures are held within the FMS database, it is still good practice and, in some cases, necessary to cross-reference position information against available radio aids.

1. A desired ADF frequency can be selected via Radio Page 2 and identified. A bearing pointer, either white or green, can be selected to present bearing to the station on the primary HSI display.

2. A VOR frequency can be tuned on Radio Page 1 and, if the primary CDI display is already assigned to FMS1 or 2, a bearing pointer can be used to present bearing information to the station on the same display.

3. Your instructor will set you exercises in tracking to beacons and learning to switch the primary NAV source from one to another and using the available pointers to best advantage.

4. Remember that each radio aid must be identified by its Morse Code identification signal using the appropriate station selection (Nav 1, Nav 2, ADF) on the Audio Control Panel.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Aircraft Limitations.

b. Wind awareness

c. Situational Awareness

COMMON ERRORS

1. You may have difficulty in reading the bearing pointer needles correctly (reading the head instead of the tail when trying to determine a radial etc.). You may also find it confusing to have several pieces of information shown on one instrument where previously they may have been displayed on several different instruments.

2. It will be vitally important during procedural training not to become fixated with use of the FMS, particularly during procedural approaches based on conventional radio aids.

APPROACH TO LANDING: NDB, VOR, ILS, RNAV

STANDARDS

Heading to be maintained ± 10°.

Speed to be maintained ±10kts.

Height to be maintained ± 100ft.

Maintaining the aircraft in balance.

DEFINITION

As already discussed, the AW139 affords the pilot the facility to fly approaches coupled to Flight Director modes, whether they are Precision or Non-Precision. He or she is thus allowed to concentrate on monitoring the approach and dealing with ATC.

For all approaches your instructor will you brief you on

(a) Cockpit set-up, FMS, Nav Frequencies

(b) Approach Briefings

(c) Navigation Management

TECHNIQUE

VOR AND NDB APPROACH

1. It will be important to ensure the correct frequencies are tuned, identified and appropriate needles and bearing pointers are displayed on the PFD.

2. Both an NDB and VOR approach could be flown using the heading (HDG) mode to follow the final approach course. In the case of a VOR approach, once cleared inbound, selecting approach (APP) on the Guidance Control panel will arm VAPP which, once captured, will ensure the aircraft follows the correct final approach course.

3. In either case, the altitude acquire (ALTA) facility will then allow the pilot to preselect the next step-down altitude and command the aircraft to descend to that altitude.

4. Upon reaching a point 100ft above the Minimum Descent Height or Decision Altitude, attention will have to be divided between the instruments and the need to lookout for the required visual references.

5. Once the necessary visual references have been achieved, the aircraft may be left coupled and the descent continued by use of the automation or the pilot may take manual control and continue the approach to land.

6 It will be important to note the difference between MDH and DA, the implications for which will be different depending upon the theatre of operations. In the case of the former, it may be possible to descend to the published height and continue inbound at that level until the Missed Approach Point is reached. In the case of the latter, it will be necessary to initiate the Missed Approach Procedure when the Altitude is reached, notwithstanding that the Missed Approach Point may not yet have been reached.

ILS APPROACH

1. While the arrival phase can be flown using the FMS database (as will be seen in a later chapter), flying an ILS first requires tuning and identifying the correct frequencies as well as selecting the correct primary NAV source to display on the HSI portion of the PFD. Keep in mind that a coupled approach will use this information.

2. While flying coupled to the FMS during the arrival phase, the pilot can use the Preview (PRV) facility to set the final approach course for the ILS and thus confirm that everything is set during the approach briefing. However, it is vitally important to pay attention to where the FMS is taking the aircraft or, if flying in heading (HDG) mode following vectors from ATC, that no inadvertent selection of NAV instead of APP (they are next to each other) on the guidance control panel causes the aircraft to deviate away from the approach simply because unnecessary FMS information remained displayed on the HSI. Your instructor will demonstrate how this can easily go wrong and how to correctly manage the information being presented.

3. Once APP is armed, LOC and GS will appear at the top of the PFD in white letters. These will change to green once each portion (localizer, glideslope) of the ILS is captured by the system.

4. The aircraft will remain coupled until reaching the Decision Altitude and, if no pilot intervention occurs at this point, will continue towards the runway where Autolevel (ALVL) will arm and gradually reduce the rate of descent and finally stop the descent at 50ft over the runway, maintaining the last heading and speed. Clearly, this is a safety function and the pilot must achieve the required visual references and have taken control to land or have initiated the required Missed Approach Procedure upon reaching the DA.

5. Again, nearing the DA it will be necessary to divide attention between the instruments and outside while you try to achieve the required visual references. This can be done in the simulator but, while flying the helicopter during training, your instructor will brief you on additional control handover procedures while flying using a visor or hood

MANUALLY FLOWN APPROACHES

1. During training, all of these approaches will be flown manually as well as coupled. As with all manual flying on instruments, corrections should be small and trends closely monitored to anticipate the required inputs in goods time thus avoiding the need for any large changes to either heading or rate of descent.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

(a) A/C limitations.

(b) Wind awareness

(c) Radio Checks.

(d) Flight instrument checks in the hover-taxi.

(e) Fuel and engine instruments checks.

(f) Plate/chart or Crew briefing.

(g) Understanding of ATC procedures.

(h) Understanding of the calculations required to obtain Decision Height / Minimum Descent Height.

COMMON ERRORS

1. The key to a successful approach is a proper approach briefing whether flying alone or in the multi-crew environment. It is important to have a clear idea of how the approach is expected to unfold so that any unexpected developments are recognized and, where necessary, corrected quickly.

2. When flying coupled, selection of the correct source and the appropriate guidance commands at each stage of the approach is critically important. We may joke about how often pilots ask “What’s it doing now?” but you do not want that to happen to you for real.

3. While flying manually, the AW139 trim system affords the pilot the opportunity to maintain very stable flight with comparatively little input. Knowing how to use the system to best advantage is important. Rolling left or right for a turn will require a significant change in roll attitude achieved by pushing and holding the beep trim to one side or the other for several seconds at a time and then making small corrections to fine tune the required angle of bank. Pitch attitude changes, however, are very small by comparison and you may find it more useful to beep fore or aft in a series of clicks, one or two at a time. Thus, if a change of three clicks is too much, for example, you can beep back one click to begin a correction.

4. The facility on the AW139 to roll wings level from any angle of bank of three degrees or less is very useful in straight and level flight, avoiding the build up of any heading changes over time but can present some difficulty while trying to make very small adjustments to maintain a localizer course. In this case, it may be helpful to apply a little sidewards pressure on the cyclic itself to left or right until the necessary correction has been achieved. Your instructor will brief you and, if necessary, demonstrate.

5. In any new cockpit environment, it is easy to become overloaded with new information or by the information being presented in a different way. The PFD/MFD displays in the AW139 carry a lot of detail, only some of which is immediately relevant at any given time. Repeated practice will help become more familiar with the displays and will allow the pilot to relax more with time and, therefore, become better able to quickly identify the specific parameters to be monitored at any given time. In the interim, it will be important to make the extra effort not to fall “behind” the aircraft during any approach and to focus on the most important information, that which is necessary to safely complete the procedure.

6. Remain vigilant during the descent so as not to go below any DA(H) or MDH.

MISSED APPROACH PROCEDURE / GO AROUND

STANDARDS

Heading to be maintained ± 10°.

Speed to be maintained ±10kts.

Height and level off IAW DA(H)/MDH.

Rate of climb at least 500fpm.

Maintaining the aircraft in balance.

DEFINITION

1. During Type-Rating training, learning to properly and safely execute a Go-Around and subsequent Missed Approach Procedure is a prominent skill that is taught, learnt and practiced. Primarily, this training is to familiarize you with the procedures for go-around in the aircraft and, in the case of the AW139, to be able to use the available automation as well as to fly the procedure manually.

2. It is reported that one of the largest contributing factors to fatal accidents overall and to all runway excursion accidents, is the failure to successfully execute a go-around and/or a failure to make a timely decision to go-around in the first place.

3. At the initiation of any go-around maneuver, especially one near to or even in visual contact with the runway, workload is significantly increased so you are likely to be functioning much nearer your maximum mental capacity than during the approach phase

TECHNIQUE

THE GO AROUND

1. In the event of a go around, follow the published Missed Approach Procedure or instructions from ATC if you are instructed to carry out a non-standard procedure. You must initiate a Go-Around if radar or ATC contact is lost or you reach your DA or Missed Approach Point without achieving the required visual references to continue. Those visual references, including aids, should have been in view for sufficient time for you to have made an assessment of the aircraft position and rate of change of position in relation to the desired flight path.

2. The required visual references are:

a. Elements of the approach light system;

b. The threshold;

c. The threshold markings;

d. The threshold lights;

e. The threshold identification lights;

f. The visual glide slope indicator;

g. The touchdown zone or touchdown zone markings;

h. The touchdown zone lights; or

i. Runway edge lights.

MISSED APPROACH PROCEDURE (MAP)

1. The MAP is published on the relevant approach chart and will be clearly identified.

2. The Missed Approach should be initiated not lower than the DA(H) on a precision approach procedure or at a specified point in non-precision approach procedures not lower than the MDH.

3. If a Missed Approach is initiated before arriving at the Missed Approach Point (MAPt), it is important that the you proceed to the MAPt (or to the middle marker fix or specified DME distance for precision approach procedures) and then follow the missed approach procedure in order to remain within the protected airspace.

4. The MAPt may be overflown at an altitude/height greater than that required by the procedure; but in the case of a missed approach with a turn, the turn must not take place before the MAPt, unless otherwise specified in the procedure.

5. The MAPt in a procedure is defined by

a. The point of intersection of an electronic glide path with the applicable DA/H in precision approaches; or,

b. A navigation facility, a fix, or a specified distance from the final approach fix in non-precision approaches.

FLYING THE MISSED APPROACH

1. While flying the approach coupled, you should get in the habit of identifying the Go-Around button on the collective at least a mile or at least 300 feet before the DA(H). This will allow an immediate response to the Go-Around decision once it is made. Keep in mind the AW139 will descend for another 50ft after the GA button is pressed while the system raises the collective and establishes itself in Go-Around mode.

2. Once engaged, GA will appear twice in green on the top of the PFD, one to replace the previously engaged vertical mode, the other to replce the previously engaged lateral mode (LOC). GA will maintain the aircraft wings level and, therefore, on the present heading and will initiate a climb at a target rate of climb of 1000fpm.

3. GA can be de-selected by pressing Standby or by selecting a vertical mode (VS or ALTA). It will also be necessary to reselect another NAV source (HDG or NAV/LNAV) so that onward navigation can be carried using the guidance control panel (HDG or NAV).

4. Note that once teh gA button is pressed, the complete Missed Approach Procedure will populate the Flight Plan page of the MCDU. However, as noted above at (3), it will be necessary to re-select LNAV as the Navigation source before the aircraft can be coupled to follow it.

5. When flying the GA manually, it will be important not to delay with the application of collective to initiate the manoeuvre while at the same time, such control input should be smooth and not too aggressive to avoid large and unnecessary yaw changes.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Aircraft Limitations.

b. Wind awareness

c. Plate/chart or Crew briefing.

d. Understanding of ATC procedures.

e. Understanding of the calculations required to obtain Decision Height / Minimum Descent Height.

COMMON ERRORS

1. Get yourself into the mentality of: “Treat every approach like you are going to conduct a missed approach” that way you will never be unprepared.

2. Remember “AVIATE, NAVIGATE, COMMUNICATE”

STANDARD INSTRUMENT DEPARTURE (SID)

STANDARDS

Heading to be maintained ± 10°.

Speed to be maintained ±10kts.

Rate of climb at least 500fpm.

Maintaining the aircraft in balance.

DEFINITION

1. A Standard Instrument Departure Route (SID) is a standard ATS route identified in an instrument departure procedure by which aircraft should proceed from take-off phase to the en-route phase.

2. Although a SID will keep aircraft away from terrain, it is optimized for ATC route of flight and will not always provide the lowest climb gradient. It strikes a balance between terrain and obstacle avoidance, noise abatement (if necessary) and airspace management considerations

3. SIDs aim to de-conflict potentially conflicting traffic by the use of specific routings, levels and check points. Typically, each runway will have a number of SIDs to ensure that air traffic is not unnecessarily delayed by deviation from the direct route from the aerodrome.

TECHNIQUE

THE STANDARD INSTRUMENT DEPARTURE

1. Air traffic control clearance must be received prior to flying a SID. A SID clearance is issued to the pilot based on a combination of the destination, the first waypoint in the flight plan, and the take-off runway used.

2. A SID consists of a number of waypoints or fixes, which may either be given by their geographical coordinates, or which may be defined by radio beacons such as VOR or NDB and radial headings, or a radial heading with a DME distance. It also includes a climb profile, and gradient instructing the pilot to cross certain points at or above a certain altitudes. A SID procedure ends at a waypoint lying on an airway which the pilot will follow from there.

3. It is important that during the pre-flight briefing the SID is briefed and that you must confirm with the use of performance charts that the aircraft is capable of performing (in those conditions) the prescribed SID climb gradient.

4. The SID assumes no turns before the departure end of the runway and before 400ft above the aerodrome elevation.

5. If a SID is cancelled by the ATC by the phrase ‘’CANCEL SID’’, then the ATC shall reissue alternative departure instructions (very often radar vectors).

6. Your instructor will demonstrate the selection of the SID from the FMS database and how to present it on the Plan and Map pages of the MFD. Generally, the SID will be flown coupled using the NAV function on the Guidance Controller although, for training, there is nothing to prevent it being flown manually.

DEVIATIONS AND SEPERATIONS

1. Though SID procedures are primarily designed for IFR traffic to join airways and depart en-route, air traffic control at busy airports can request that VFR traffic also follows such a procedure so that aircraft separation can be more easily maintained. Usually VFR pilots will be given radar vectors corresponding to the SID lateral route with different altitude restrictions.

2. You must follow the published SID route. Small deviations are allowed (usually there are flight paths of some kilometers wide) but bigger deviations may cause separation conflicts.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Aircraft Limitations.

b. Wind awareness

c. Plate/chart or Crew briefing.

d. Understanding of ATC procedures.

STAR

STANDARDS

Heading to be maintained ± 10°.

Speed to be maintained ±10kts.

Maintaining balance within ± 1 ball width of center position.

DEFINITION

1. A Standard Arrival Route (STAR) is a standard ATS route identified in an approach procedure by which aircraft should proceed from the en-route phase to an initial approach fix.

2. STARs aim to de-conflict potentially conflicting traffic by the use of specific routings, levels and check points. Typically, each runway will have a number of STARs to ensure that air traffic is not unnecessarily delayed by deviation from the direct route to the aerodrome

TECHNIQUE

THE STANDARD INSTRUMENT ARRIVAL

1. A typical STAR consists of a set of starting points, called transitions, and a description of routes (typically via VORs and intersections) from each of these transitions to a point near a destination airport, upon reaching which the aircraft can join an instrument approach (IAP) or be vectored for a final approach by terminal air traffic control.

2. Not all airports have published STARs; however, most relatively large or not easily accessible (for example, in a mountainous area) airports do. Sometimes several airports in the same area share a single STAR; in such case, aircraft destined for any of the airports in such group follow the same arrival route up until reaching the final waypoint, after which they join approaches for their respective destination airports.

3. Not all STARs are for IFR flights. Occasionally STARs are published for visual approaches, in which case they specify visible landmarks on the ground and other visual reference points instead of waypoints or radio navigation aids.

4. STARs can be very detailed (as is often the case in Europe), allowing pilots to go from descent to approach entirely on their own once ATC has cleared them for the arrival, or they can be more general (as is often the case in the United States), providing guidance to the pilot which is then supplemented by instructions from ATC.

5. Your instructor will demonstrate the selection of the STAR from the FMS database and how to present it on the Plan and Map pages of the MFD. Generally, the STAR will be flown coupled using the NAV function on the Guidance Controller although, for training, there is nothing to prevent it being flown manually. Workload should

be split between maintaining a good and accurate scan, flying the aircraft and planning ahead to the approach procedure which will follow the STAR.

RECOMMENDED PRACTICE

1. If you have any concerns about meeting the height or speed requirements advise ATC immediately, this could be due to icing limitations or weather (CB's) for example, ATC will adjust their planning accordingly.

DISPLAY AIRMANSHIP

1. The main airmanship points of this exercise are:

a. Aircraft Limitations.

b. Wind awareness

c. Plate/chart or Crew briefing.

d. Understanding of ATC procedures.

COMMON ERRORS

1. Keep ahead of the A/C as it is very easy to fall behind when the workload is high. Always look ahead to the "next event".

2.AW139.2 FLIGHT MANEUVERS REFERENCE LIST

Flight Manuals of all aircraft included in the authorization chart of our ATO.

All normal maneuvers to be performed in the trainings are detailed in AW139 RFM PART 1 Section 2 Normal Procedures. The training will be based on the principles of this section.

All emergency maneuvers to be performed in the trainings are detailed in AW139 RFM PART 1 Section 3 Emergency and Malfunction Procedures. The training will be based on the principles of this section.

CAT A MANEUVERS

All CAT A maneuvers to be performed in the trainings are detailed in AW139 RFM Supplement 12 CAT A Operations. The training will be based on the principles of this section.

2.3 PHASES OF TRAINING

2.3.1 Phases of Training

- **a.** The type rating training course will be carried out in two main phases as flight training and theoretical training.
- **b.** However, to increase the effectiveness of the training and get the best efficiency, the flight training phase and the theoretical training phase are carried out in a coordinated manner.
- **c.** Since type rating flight training is of short duration and consists of flight movements that complement each other, it will be considered as a single training phase.
- **d.** Since type rating theoretical training is short-term and consists of theoretical subjects that complement each other, it will be considered as a single training phase.

2.3.2 Emergency Procedures

- **a.** In the pre-flight briefings every day, 1 or 2 emergency issues are definitely reviewed.
- **b.** In each flight period, at least 1 emergency situation is created for the student and the student's behavior is observed.
- **c.** In the post flight briefing held every day, the emergency applications made during the flight period are critiqued and the correct course of action and application are taught to the student.

2.4 INTEGRATION OF THE SUBJECTS

- **a.** The flight training phase and the theoretical training phase are carried out in a coordinated manner to increase the effectiveness of the training, to get the best efficiency and to use the knowledge acquired in the theoretical lessons freshly during the flight training.
- **b.** The purpose of coordination and integration is to make theoretical training subjects one hour ahead of flight training subjects.
- **c.** Theoretical Knowledge Instructor and Flight Instructor will be in constant contact and cooperation. Any subject that has not been theoretically covered will not be shown in flight training.
- **d.** Helicopter Type Rating Training Program is planned in article 1.4.2 in a way to ensure the harmony of theoretical and flight training.

2.5 STUDENT PROGRESS

- **a.** Theoretical education is a single phase. Flight training is handled as two phases as "basic orientation (Visual) flight training"(VFR) and "instrument orientation flight training"(IFR).
- **b.** Therefore, the student's development assessments are not made at the end of the phase, but within the educational process as stated below.
- **c.** The student who cannot reach the required standards at the end of VFR flight training cannot start the next stage, the IFR flight training.
- **d.** To determine the theoretical training progress of the student, at the end of the main course topics (limits, emergency procedures, etc.), the theoretical knowledge instructors conduct progress tests that teach critical topics again.
- **e.** It should never be forgotten that reaching the desired standards of the student is the main goal.
- **f.** The student will not be allowed to skip information both in the flight training section and in the theoretical training. It should not be forgotten that an incomprehensible subject or flight maneuvers will affect the subject and maneuvers to be seen in the future.
- **g.** Whether or not each subject has been learned by the student will be checked by the feedback method and after than the next subjects will be trained.

2.6 TEACHING METHODS

2.6.1 Theoretical Knowledge Lesson Training Method

- **a.** Theoretical Knowledge Training course curriculum and training subjects are notified to the student at the beginning of the course.
- **b.** Depending on the training program, the student will come to the theoretical lessons prepared one day in advance.
- **c.** The presentation of the theoretical course topics will be made by the theoretical course instructor with the conference method.
- **d.** It is possible to participate in the lesson by asking the subjects that the students do not understand, and the instructor will test whether the subjects are understood by asking questions.
- **e.** Whether the theoretical subjects have been learned by the student will be checked by the feedback method and the next subject will be passed.
- **f.** Theoretical course topics are planned in a certain order to ensure compatibility with flight training. Theoretical Knowledge Training Instructors have to follow the order in the curriculum.

2.6.2 Flight Training Method

- **a.** As indicated in Article “1.6.1.1 Helicopter Type Rating Training Program”, two flight periods are planned for each training day.
- **b.** The flight instructor and student will brief each other for one hour before and after the flight instruction.
- **c.** Emergencies, limits, flight maneuvers, meteorology, flight safety and ATC procedures are discussed at the briefings.
- **d.** The student attends the pre-flight briefing prepared for that day's flight training topic.
- **e.** The instructor explains the subject of flight training theoretically to the student in the briefing. In the last part of the briefing, it provides a full understanding of the subject with mutual questions and feedback method.
- **f.** At the beginning of the flight training, the instructor demonstrates and explains the training topic at the same time.
- **g.** Following this, the student makes the flight movement and repeats it several times.
- **h.** While the student is making the maneuvers, the instructor makes the corrections verbally, does not make corrections by hand unless it is necessary, patiently waits for the student to be able to make the entire flight movement himself.
- **i.** In the post-flight briefings, a general review and evaluation is made, including the mistakes made by the student.
- **j.** Meanwhile, when necessary, the instructor evaluates the flight maneuvers learned in previous periods. It ensures that the issues that it deems lacking are reinforced with feedback trainings.
- **k.** Flight training subjects are planned in a certain order to ensure harmony with the theoretical training. Flight instructors have to follow the order in the flight training program.

2.7 PROGRESS TESTS

- a. Student progress tests will be done as stated in clause 1.9.
- b. The Flight Instructor and Theoretical Knowledge Instructor are responsible to the Head of Training for the progress tests.
- c. Since the scope and duration of type rating training is not long, progress tests will be applied as practical and theoretically short tests.

3. SYNTHETIC FLIGHT TRAINING (ORA.ATO.135)

a. Synthetic flight training includes the topics described in “Chapter-2 Briefing and Flight Movements”.

b. KAAN AIR ATO provides simulator flight trainings in line with the SHT-1S instruction. Training will be performed in SHGM / EASA approved Full Flight Simulators (FFS).

4. THEORETICAL KNOWLEDGE TRAINING

4.1 General

a. The structure of theoretical knowledge training, the characteristics of the training subjects, the standards and objectives of the training are as explained in SECTION-2.

b. Theoretical trainings will be given in Ayazaga KAAN Heliport Facilities Classroom, which has been prepared as KAAN AIR ATO Classroom.

c. In many stages of the theoretical training, helicopters in the KAAN AIR inventory will be used as training tools.

d. While giving theoretical training, training aids will be utilized to the maximum in order to support and reinforce the course.

e. Theoretical Knowledge Training Instructor will give the lessons in coordination with the flight training according to the "Type Rating Theoretical Knowledge Instructor Lesson Plan".

4.2 THEORETICAL KNOWLEDGE LESSON PLAN (AMC1 FCL.725(a))

Theoretical knowledge training plans of the authorized training courses are explained in detail in Sections 1.6.1.1.1 and 1.6.1.1.2 of the Training Manual.

4.3 Training Aid Materials

a. Training aids are available in the KAAN APPROVED TRAINING ORGANIZATION Classroom.

b. The Theoretical Knowledge Instructor is responsible for keeping, maintaining, and protecting the educational aid materials always ready for the lesson.

c. Educational aids available in the classroom are as follows:

1) Blackboard.

2) Computer.

3) Helicopter model.

4) Plotter, ruler etc. stationery.

4.4 Theoretical Knowledge Instructor

Responsibilities:

Theoretical Knowledge Instructors are responsible to the Head of Training to monitor the individual progress of the candidates and to take the necessary measures for their development, with the ground training to be given to the candidates.

Features:

Theoretical knowledge teachers should have the following characteristics

a. Have aviation experience

b. To have taken a course in flight instruction or training techniques or to have sufficient knowledge and experience on the type of helicopter to be trained.

c. Must be trained in the subject to be taught.

5. APPENDIXES AND FORMS

APP-1 DAILY FLIGHT TRAINING RECORD

KAAN AIR **Günlük Uçuş Eğitim Kaydı / Daily Flight Record**

Helikopter Tipi / Type :

Aday / Trainee ;

Adı / Name : Soyadı / Surname : Lisans No / License Nr :

Uçuş Öğretmen (ler) i / Flight Instructor (s);

Adı / Name : Lisans No / License Nr : İmza / Signature :

Adı / Name : Lisans No / License Nr : İmza / Signature :

Date

1. Pre-flight preparation and checks

1.1	Helicopter exterior visual inspection; location of each item and purpose of inspection
1.2	Cockpit inspection
1.3	Starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies
1.4	Taxiing/air taxiing in compliance with air traffic control instructions or with instructions of an instructor
1.5	Pre take-off procedures

2. Flight manoeuvres and procedures

2.1	Take-offs (various profiles)
2.2	Sloping ground or crosswind take-offs & landings
2.3	Take-off at maximum take-off mass (actual or simulated maximum take-off mass)
2.4	Take off with simulated engine failure shortly before reaching TDP or DPATO
2.4.1	Take off with simulated engine failure shortly after reaching TDP or DPATO
2.5	Climbing and descending turns to specified headings
2.5.1	Turns with 30 degrees bank, 180 degrees to 360 degrees left and right, by sole reference to instruments
2.6	Autorotative descents
2.6.1	Autorotative landing (SEH only) or power recovery
2.7	Landings, various profiles
2.7.1	Go around or landing following simulated engine failure before LDP or DPBL

3. Normal and abnormal operations of the following systems and procedures

3.1	Engine
3.2	Air conditioning (heating, ventilation)
3.3	Pitot/static system
3.4	Fuel System
3.5	Electrical system
3.6	Hydraulic system
3.7	Flight control and Trim-system
3.8	Anti- and de-icing system
3.9	Autopilot/Flight director
3.10	Stability augmentation devices
3.11	Weather radar, radio altimeter, transponder
3.12	Area Navigation System
3.13	Landing gear system
3.14	Auxiliary power unit
3.15	Radio, navigation equipment, instruments flight management system

Date

4. Abnormal and emergency procedures

4.1	Fire drills (including evacuation if applicable)
4.2	Smoke control and removal
4.3	Engine failures, shut down and restart at a safe height
4.5	Tail rotor control failure (if applicable)
4.5.1	Tail rotor loss (if applicable)
4.6	Incapacitation of crew member – MPH only
4.7	Transmission malfunction
4.8	Other emergency procedures as outlined in the appropriate Flight Manual

5. Instrument Flight Procedures (to be performed in IMC or simulated IMC)

5.1	Instrument take-off: transition to instrument flight is required as soon as possible after
5.1.1	Simulated engine failure during departure
5.2	Adherence to departure and arrival routes and ATC instructions
5.3	Holding Procedures
5.4	3D operations to DH/A of 200 feet (60 m) or to higher minima if required by the approach procedure
5.4.1	Manually, without flight director
5.4.2	Manually, with flight director
5.4.3	With coupled autopilot
5.4.4	Manually, with one engine simulated inoperative; engine failure has to be simulated during final approach before passing 1000 feet above aerodrome level until touchdown or until completion of the missed approach procedure
5.5	2D operations down to the minimum descent altitude MDA/H
5.6	Go-around with all engines operating on reaching DA/DH or MDA/MDH
5.6.1	Other missed approach procedures
5.6.2	Go-around with one engine simulated inoperative on reaching DA/DH or MDA/MDH
5.7	IMC autorotation with power recovery
5.8	Recovery from unusual attitudes

6. Use of optional equipment

Remarks / Notes :

Mark Qualifications

Mark	Qualifications
1	Unacceptable
2	Acceptable
3	Good
4	Very Good

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APP-2 SINGLE PILOT HELICOPTER TYPE RATING APPLICATION, TRAINING/SKILL TEST and PROFICIENCY CHECK RESULT FORM

KAAN AIR

TEK/ÇOK PİLOTLU HELİKOPTER TİP YETKİSİ BAŞVURU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

1. KİŞİSEL BİLGİLER / *PERSONAL INFORMATION*			
Adayın Soyadı, Adı: *Applicant Surname, Name:*	BBBBB, Aaaaaaa		
Milliyeti: *Nationality:*	XX	**T.C. Kimlik No:** *ID Number:*	12345678901
Telefon No: *Phone Number:*	+90 532 111 22 33	**E-Posta:** *E-Mail:*	e-mail@kaanair.com
Adres: *Address:*	KAAN HAVACILIK A.S. , ISTANBUL / TURKEY		
☐ **SHGM Kayıtlarındaki adres bilgilerimin güncellenmesini istiyorum.** *Please update my address information on DGCA records.*			
Bu başvuru formu ve ekinde yer alan belge ve bilgilerin doğru ve eksiksiz olduğunu beyan ederim. *I, hereby, confirm that all the information and documents given in this form and in its attachments are full and correct.*			
Tarih: *Date:*	.... / 0x / 202x	**Adayın İmzası:** *Signature of Applicant:*	

2. Tek/Çok Pilotlu Tek/Çok Motorlu Helikopterler / *Single/Multi-Pilot Single/Multi Engine Helicopters*			
Havaaracı Tipi: *Aircraft Type:*	A11x TC-H____	**Yetenek testi:** *Skill test:* ☐	**Yeterlilik Kontrolü:** *Proficiency check:* ☐

3. ONAYLI EĞİTİM ORGANİZASYONUN ONAYI / *APPROVAL OF ATO*			
Eğitim Müdürü olarak eğitimin SHT-FCL ve onaylı eğitim el kitaplarına uygun olarak gerçekleştirildiğini ve başvuranın belirtilen tipte/sınıfta yetenek testine/yeterlilik kontrolüne girebilmek için gerekli bilgi ve yeteneğe sahip olduğunu onaylarım. *The Head of Training confirms that the training has been performed in compliance with SHT-FCL and the approved training manuals, and that the applicant possesses all relevant knowledge and skills to take the skill test/proficiency check on the following type/class.*			
OEO Adı: *ATO Name:*	KAAN ATO	**Yetki Numarası:** *Approval Number:*	TR.ATO.015
Eğitim Müdürünün Adı: *Name of HT:*	Aaaaa BBBBB	**Eğitim Müdürünün İmzası ve Mühür:** *Signature and Seal of HT:*	
Tarih: *Date:*	.... / 0x / 202x		

4. BAŞVURU TALİMATLARI / ***APPLICATION PROCEDURES***	
Bu başvuru formu Sivil Havacılık Genel Müdürlüğü – Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA adresine ulaştırılmalıdır. Adaylar başvuru formuyla beraber ayrıca aşağıda belirtilen evrakları sunmalıdırlar. *Application form must be delivered to following address, Sivil Havacılık Genel Müdürlüğü – Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA. Documents listed below must be attached to this form.*	
	SHGM
Geçerli Sağlık Sertifikası Fotokopisi / *Copy of Valid Medical Certificate*	
Mevcut Lisansının Fotokopisi / *Copy of Your Current Licence*	
Uçuş Defteri Aslı ve İlgili Sayfaların Fotokopisi / *Logbook and Copy of Related Pages*	
Ödeme Belgesi / *Payment Reciept*	
5. SADECE SHGM KULLANIMI İÇİN /*DGCA USE ONLY*	
Yukarıda belirtilen gerekliliklerin doğruluğu tarafımca kontrol edilmiştir. SHGM Yetkilisi İsim – İmza	

KAAN AIR

TEK/ÇOK PİLOTLU HELİKOPTER TİP YETKİSİ BAŞVURU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

Tek veya Çok Pilotlu Helikopter Tip Yetkisi Yetenek Testi/Yeterlilik Kontrolü Sonuç Formu

SPH/MPH Type Rating Skill Test/Proficiency Check Result Form *(Reference: PART–FCL APPENDIX-9)*

Adayın Soyadı, Adı: *Applicant Surname, Name:* BBBBB, Aaaaa		**Lisans Türü ve Numarası:** *Title of Licence and Number:* TR.FCL.H.0xxxx	
Tarih: *Date:* .... / 0x / 202x	**Havaaracı Tipi:** *Aircraft Type:* A11x	**Havaaracı/Simülatör Tescil İşareti:** *Aircraft Registration/FSTD ID:* TC-H	
Ayrılış Meydanı: *Departure Aerodrome:*		**Varış Meydanı:** *Arrival Aerodrome:*	
Kalkış zamanı: *Take-off time:*	**İniş zamanı:** *Landing time:*	**Toplam Uçuş Süresi:** *Total Flight Time:*	
	Yetenek testi: *Skill test:* ☐	**Yeterlilik Kontrolü:** *Proficiency check:* ☐	

Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
					Eğitim tamamlan-dığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	*FFS*	*H*		*FFS, H*	
BÖLÜM 1 Uçuş Öncesi Hazırlıkları ve Kontrolleri ***SECTION 1 Pre-flight preparation and checks***							
1.1	Helikopterin harici kontrollerinin yapılması parçaların yerlerinin ve fonksiyonlarının incelemesi. *Helicopter exterior visual inspection; location of each item and purpose of inspection.*			P		M (if performed in the helicopter) (helikopterde yapılması halinde)	
1.2	Kokpit kontrolü *Cockpit inspection*		P	--->		M	
1.3	Çalıştırma prosedürleri, radyo ve seyrüsefer ekipmanı kontrolü, seyrüsefer ve haberleşme frekanslarının seçilmesi ve ayarlanması. *Starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies*	P	--->	--->		M	
1.4	Hava trafik kontrol talimatlarına veya öğretmenin talimatlarına uygun olarak taksi yapma/havır yapma *Taxiing/air taxiing in compliance with air traffic control instructions or with instructions of an instructor*		P	--->		M	
1.5	Kalkış öncesi prosedürleri ve kontrolleri *Pre take-off procedures*	P	--->	--->		M	
BÖLÜM 2 Uçuş Manevraları ve Usulleri ***SECTION 2 Flight manoeuvres and procedures***							
2.1	Kalkışlar (çeşitli profiller). *Take-offs (various profiles)*		P	--->		M	
2.2	Yamaç ve yan rüzgarında kalkışlar ve inişler		P	--->			

KAAN AIR

TEK/ÇOK PİLOTLU HELİKOPTER TİP YETKİSİ BAŞVURU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
					Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	FFS	H		FFS, H	
	Sloping ground or crosswind take-offs & landings						
2.3	Azami kalkış ağırlığında kalkış (gerçek veya benzetilmiş azami kalkış ağırlığı). *Take-off at maximum take-off mass (actual or simulated maximum take-off mass)*	P	--->	--->			
2.4	Kalkışta TDP'ye veya DPATO'ya ulaşmadan hemen önce benzetilmiş motor arızası ile kalkış. *Take off with simulated engine failure shortly before reaching TDP or DPATO*		P	--->		M	
2.4.1	TDP'ye veya DPATO'ya ulaştıktan hemen sonra benzetilmiş motor arızası ile kalkış. *Take off with simulated engine failure shortly after reaching TDP or DPATO*		P	--->		M	
2.5	Belirtilmiş istikametlere tırmanışlı ve süzülüşlü dönüşler. *Climbing and descending turns to specified headings*	P	--->	--->		M	
2.5.1	Sadece aletler referans alınarak 30° yatışlarla, sola ve sağa 180° ila 360° lik dönüşler. *Turns with 30 degrees bank, 180 degrees to 360 degrees left and right, by sole reference to instruments*	P	--->	--->		M	
2.6	Otorotatif süzülüş. *Autorotative descent*	P	--->	--->		M	
2.6.1	Yere kadar otorotatif iniş (sadece SEH) veya güçlü kurtarma. *Autorotative landing (SEH only) or power recovery*		P	--->		M	
2.7	İnişler, çeşitli profillerde. *Landings, various profiles*		P	--->		M	
2.7.1	Yaklaşmada LDP veya DPBL öncesinde benzetilmiş motor arızası sonrasında pas geçme veya iniş. *Go around or landing following simulated engine failure before LDP or DPBL*		P	--->		M	
BÖLÜM 3 Normal ve anormal durumlarda aşağıdaki sistem ve prosedürlerin kullanımı: **SECTION 3 Normal and abnormal operations of the following systems and procedures:**							
3	Aşağıdaki sistem ve prosedürlerin normal ve anormal hallerde kullanımı: *Normal and abnormal operations of the following systems and procedures:*					M	*(Bu bölümden asgari 3 unsur zorunlu olarak seçilecektir.)* *(A mandatory minimum of 3 items shall be selected from this section)*

KAAN AIR

TEK/ÇOK PİLOTLU HELİKOPTER TİP YETKİSİ BAŞVURU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
					Eğitim tamamlan-dığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	FFS	H		FFS, H	
3.1	Motor *Engine*	P	--->	--->			
3.2	Klima (ısıtma, havalandırma) *Air conditioning (heating, ventilation)*	P	--->	--->			
3.3	Pitostatik sistem *Pitot/static system*	P	--->	--->			
3.4	Yakıt Sistemi *Fuel System*	P	--->	--->			
3.5	Elektrik sistemi *Electrical system*	P	--->	--->			
3.6	Hidrolik sistem *Hydraulic system*	P	--->	--->			
3.7	Uçuş kontrol ve Trim sistemi *Flight control and Trim-system*	P	--->	--->			
3.8	Buzlanmayı önleyici ve buzlanmayı giderici sistemler *Anti-icing and de-icing system*	P	--->	--->			
3.9	Otomatik Pilot / Uçuş yönlendiricisi *Autopilot/Flight director*	P	--->	--->			
3.10	Stabilizasyon cihazları *Stability augmentation devices*	P	--->	--->			
3.11	Meteoroloji radarı, radyo altimetre, transponder *Weather radar, radio altimeter, transponder*	P	--->	--->			
3.12	Saha Seyrüsefer Sistemi *Area Navigation System*	P	--->	--->			
3.13	İniş takımı sistemi *Landing gear system*	P	--->	--->			
3.14	Yardımcı güç ünitesi (APU) *Auxiliary power unit*	P	--->	--->			
3.15	Radyo, seyrüsefer ekipmanı, aletler, uçuş idare sistemi *Radio, navigation equipment, instruments flight management system*	P	--->	--->			
BÖLÜM 4 Anormal ve Acil Durum Prosedürleri ***SECTION 4 Abnormal and emergency procedures***							
4	Anormal haller ve acil durum prosedürleri *Abnormal and emergency procedures*					M	Bu bölümden asgari 3 unsur zorunlu olarak seçilecektir. *A mandatory minimum of 3 items shall be selected from this section*

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Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training* FTD	FFS	H	Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check* Kontrol Ortamı *Chkd. in* FFS, H	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
4.1	Yangın tatbikatları (tatbik edilebilmesi halinde tahliye dahil) *Fire drills (including evacuation if applicable)*	P	--->	--->			
4.2	Duman kontrolü ve giderme *Smoke control and removal*	P	--->	--->			
4.3	Motor arızaları, emniyetli bir irtifada motor durdurma ve yeniden çalıştırma *Engine failures, shut down and restart at a safe height*	P	--->	--->			
4.4	Yakıt boşaltma (benzetilmiş) *Fuel dumping (simulated)*	P	--->	--->			
4.5	Kuyruk rotoru kumanda arızaları (tatbik edilebilmesi halinde) *Tail rotor control failure (if applicable)*	P	--->	--->			
4.5.1	Kuyruk rotoru güç kaybı (tatbik edilebilmesi halinde) *Tail rotor loss (if applicable)*	P	--->	Bu egzersiz için helikopter kullanılmayabilir *Helicopter may not be used for this exercise*			
4.6	Uçuş ekibi üyesinin iş görmez olması - sadece MPH *Incapacitation of crew member – MPH only*	P	--->	--->			
4.7	Güç aktarma arızaları *Transmission malfunctions*	P	--->	--->			
4.8	Uygun Uçuş El Kitabında belirtilen diğer acil durum prosedürleri *Other emergency procedures as outlined in the appropriate Flight Manual*	P	--->	--->			
BÖLÜM 5 Aletli Uçuş Usulleri (IMC veya benzetilmiş IMC'de icra edilecektir) **SECTION 5 Instrument Flight Procedures (to be performed in IMC or simulated IMC)**							
5.1	Alet kalkışı: kalkıştan sonra mümkün olan en kısa sürede aletli uçuşa geçiş gerekir. *Instrument take-off: transition to instrument flight is required as soon as possible after becoming airborne*	P*	--->*	--->*			
5.1.1	Ayrılış (Hareket) sırasında benzetilmiş motor arızası *Simulated engine failure during departure*	P*	--->*	--->*		M*	
5.2	Ayrılış (hareket) ve varış rotalarına ve ATC talimatlarına uyum. *Adherence to departure and arrival routes and ATC instructions*	P*	--->*	--->*		M*	
5.3	Bekleme usulleri *Holding Procedures*	P*	--->*	--->*			

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(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training*			Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check* Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	FFS	H		FFS, H	
5.4	200 feet (60 m) veya yaklaşma prosedürü gerektirdiği hallerde daha yüksek bir DH/A minimumuna yapılacak 3B operasyon *3D operations to DH/A of 200 feet (60 m) or to higher minima if required by the approach procedure*	P*	--->*	--->*			
5.4.1	Manuel olarak, uçuş yönlendiricisi olmadan Not: RFM'e göre, RNP YAKLAŞMA prosedürleri otopilot veya Uçuş Yönlendiricisi kullanımı gerektirebilir. Manuel uçuş prosedürü, gereken sınırlamalar dikkate alınarak seçilmelidir (örneğin RFM'in sınırlaması durumunda, 5.4.1 için bir ILS yaklaşması seçin) *Manually, without flight director.* *Note: According to the RFM, RNP APCH procedures may require the use of autopilot or Flight director. The procedure to be flown manually shall be chosen taken into account such limitations (example choose an ILS for 5.4.1 in case of such RFM limitation)*	P*	--->*	--->*		M*	
5.4.2	Uçuş yönlendirici ile veya uçuş yönlendirici olmadan manuel olarak *Manually, with Flight Director*	P*	--->*	--->*		M*	
5.4.3	Otomatik pilot bağlanmış olarak *With coupled autopilot*	P*	--->*	--->*			
5.4.4	Manuel olarak, benzetilmiş gayrifaal bir motor ile; motor arızası meydan seviyesi + 1000 feeti geçme öncesinden teker koymaya kadar son yaklaşmada veya pas geçme usulü tamamlanıncaya kadar benzetilmelidir *Manually, with one engine simulated inoperative; engine failure has to be simulated during final approach before passing 1000 feet above aerodrome level until touchdown or until completion of the missed approach procedure*	P*	--->*	--->*		M*	
5.5	Asgari alçalma irtifasına MDA/H kadar icra edilecek 2B operasyon *2D operations down to the minimum descent altitude MDA/H*	P*	--->*	--->*		M*	
5.6	DA/DH veya MDA/MDH'ye varmadan önce tüm motorlar çalışır halde pas geçme *Go-around with all engines operating on reaching DA/DH or MDA/MDH*	P*	--->*	--->*			
5.6.1	Diğer pas geçme usulleri *Other missed approach procedures*	P*	--->*	--->*			
5.6.2	DA/DH veya MDA/MDH'ye varmadan benzetilmiş tek motor arızasında pas geçme *Go-around with one engine simulated inoperative on reaching DA/DH or MDA/MDH*	P*				M*	
5.7	IMC'de güçlü kurtarma ile otorotasyon *IMC autorotation with power recovery*	P*	--->*	--->*		M*	
5.8	Anormal durumlardan kurtarma *Recovery from unusual attitudes*	P*	--->*	--->*		M*	

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(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
					Eğitim tamamlan-dığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	FFS	H		FFS, H	
BÖLÜM 6 İlave Ekipmanın Kullanımı ***SECTION 6 Use of Optional equipment***							
6	İlave ekipmanın kullanımı *Use of optional equipment*	P	--->	--->			

SONUÇ / *RESULT*		
GEÇTİ *PASSED* ☐	**KISMEN GEÇTİ** *PARTIALLY PASSED* ☐	**KALDI** *FAILED* ☐
NOTLAR / *REMARKS:*		

LİSANSINDA TÜRKÇE DİL YETERLİLİĞİ BULUNMAYAN ADAYLAR İÇİN; *FOR THE APPLICANTS WHO HASN'T GOT THE TURKISH LANGUAGE PROFICIENCY LEVEL;*		
SEVİYE 6 *LEVEL 6* ☐	**DEĞERLENDİRİLMEDİ** *NOT EVALUATED* ☐	**YETERLİ DEĞİL** *INADEQUATE* ☐

ADAY / *APPLICANT*	
Adı Soyadı / *Name and Surname:* BBBBB, Aaaaa	**İmza ve Tarih** / *Signature and Date:* ……… / 0x / 202x

KONTROL PİLOTU / *EXAMINER*		
Adı Soyadı / *Name and Surname:* **Yetki Numarası** / *Authorisation Number:*	BBBBB, Aaaaa	**İmza ve Tarih** / *Signature and Date:* ……. / 0x /202x

KAAN AIR

TEK/ÇOK PİLOTLU HELİKOPTER TİP YETKİSİ BAŞVURU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(SPH/MPH Type Rating Skill Test / Proficiency Check Application and Report Form)

EĞİTİMİN/YETENEK TESTİNİN/YETERLİLİK KONTROLÜNÜN İÇERİĞİ

CONTENT OF THE TRAINING/SKILL TEST/PROFICIENCY CHECK

(Reference: PART–FCL APPENDIX-9)

1. Sembollerin anlamları :

P = SPH tip yetkisi tanzimi için sorumlu pilot (PIC) olarak eğitilen pilot veya MPH tip yetkisi için Uçan Pilot (PF) ve Uçmayan Pilot (PNF) konumunda sorumlu pilot (PIC) veya ikinci pilot olarak eğitilen pilot.

2. Pratik eğitim en azından, (P) olarak gösterilen eğitim ekipmanında icra edilecektir veya ok işareti (——>) ile gösterilen daha yüksek herhangi bir ekipmanla yapılabilecektir.

3. Kullanılan eğitim ekipmanı aşağıdaki kısaltmalar ile belirtilmektedir:

FFS = Tam uçuş simülatörü

FTD= Uçuş Eğitim Cihazı

H = Helikopter

4. Yıldız (*) işaretli unsurlar gerçek veya benzetilmiş IMC'de sadece, IR(H) yenilemesi veya temdidi talep eden veya söz konusu yetkinin imtiyazlarını başka bir tipe genişletmek isteyen adaylar tarafından icra edilecektir.

5. Aletli uçuş usulleri (5.Bölüm) sadece, IR(H) yenilemesi veya temdidi talep eden veya söz konusu yetkinin imtiyazlarını başka bir tipe genişletmek isteyen adaylar tarafından icra edilecektir. Bu amaçla bir FFS veya FTD 2/3 kullanılabilecektir.

6. Yetenek testi/yeterlilik kontrolü sütununda "M" harfinin olması, zorunlu egzersizleri gösterecektir.

7. Onaylı tip yetkisi kursunun içeriğinde bulunması halinde, pratik eğitim için bir FSTD kullanılacaktır.

Kursun onaylanması için aşağıdaki hususlar göz önünde bulundurulur:

(i) FFS veya FNPTII'nin PART ARA ve Part-ORA'de belirtilen özellikleri;

(ii) öğretmenin veya kontrol pilotunun vasıfları;

(iii) kursun, FFS veya FNPT II'de verilecek bölümünün miktarı;

(iv) eğitime tabi tutulan pilotun nitelikleri ve benzer tipler üzerinde daha önceki tecrübesi.

(iv) yeni tip yetkisinin tanzimi sonrasında yapılan gözetim altında uçuş tecrübesi miktarı.

ÇOK PİLOTLU HELİKOPTERLER:

8. Çok pilotlu helikopter tip yetkisine ve ATPL(H) tanzimine yönelik yetenek testine başvuran adaylar sadece 1. ila 4. Bölümleri ve geçerli olması halinde 6.Bölümü alacaklardır.

9. Çok pilotlu helikopter tip yetkisi temdidi veya yenilemesi için yeterlilik kontrolüne başvuran adaylar sadece 1. ila 4. Bölümleri ve geçerli olması halinde 6.Bölümü alacaklardır.

Kalkış Zamanı: Helikopterin motoru çalıştırılıp, pallerin dönmeye başladığı an.

İniş Zamanı: Helipkopterin motoru susturulup, pallerin tam olarak durduğu an.

1. The following symbols mean:

P = Trained as PIC for the issue of a type rating for SPH or trained as PIC or Co-pilot and as PF and PNF for the issue of a type rating for MPH.

2. The practical training shall be conducted at least at the training equipment level shown as (P), or may be conducted up to any higher equipment level shown by the arrow (—>).

3. The following abbreviations are used to indicate the training equipment used:

FS = Flight Simulator

FTD = Flight Training Device

H = Helicopter

4. The starred items (*) shall be flown in actual or simulated IMC, only by applicants wishing to renew or revalidate an IR(H), or extend the privileges of that rating to another type.

5. Instrument flight procedures (Section 5) shall be performed only by applicants wishing to renew or revalidate an IR(H) or extend the privileges of that rating to another type.An FFS or FTD 2/3 may be used for this purpose

6. Where the letter 'M' appears in the skill test/proficiency check column this will indicate the mandatory exercise.

7. An FSTD shall be used for practical training and testing if the FSTD forms part of a type rating course. The following considerations will apply to the course:

(i) the qualification of the FSTD as set out in the relevant requirements of Part-ARA and Part-ORA;

(ii) the qualifications of the instructor and examiner;

(iii) the amount of FSTD training provided on the course;

(iv) the qualifications and previous experience in similar types of the pilot under training; and

(v) the amount of supervised flying experience provided after the issue of the new type rating.

MULTI-PILOT HELICOPTERS

8. Applicants for the skill test for the issue of the multi-pilot helicopter type rating and ATPL(H) shall take only sections 1 to 4 and, if applicable, section 6.

9. Applicants for the revalidation or renewal of the multi-pilot helicopter type rating proficiency check shall take only sections 1 to 4 and, if applicable, section 6.

***Take-off Time:** The moment that the helicopter engines are started and pals start to rotate.*

***Landing Time:** The moment the helicopter engines are shut down and the pals stops to rotate exactly.*

APP-3 FCL TYPE RATING INSTRUCTOR – TRI(H) APPLICATION AND SKILLS TEST RESULT FORM

KAAN AIR

PART-FCL TİP YETKİSİ ÖĞRETMENİ – TRI(H) BAŞVURU VE YETENEK TESTİ SONUÇ FORMU
(PART-FCL TYPE RATING INSTRUCTOR TRI(H) APPLICATION AND SKILL TEST RESULT FORM)

1. KİŞİSEL BİLGİLER / *PERSONAL INFORMATION*			
Başvuranın Soyadı, Adı: *Applicant's Last Name, Name*	YYYYYY, Xxxxxxx		
Milliyeti: *Nationality:*	TR	**Doğum Tarihi (gg/aa/yyyy):** *Date of Birth (dd/mm/yyyy):*	21-APR-1973
Cep Telefonu No: *Mobile Phone Number:*	+90 533 342 94 90	**E-Posta:** *E-Mail:*	zzzzzz@kaanair.com
Adres: *Address:*	KAAN HAVACILIK A.S. , ISTANBUL / TURKEY		
☐ **SHGM kayıtlarındaki adres bilgilerimin güncellenmesini istiyorum.** *Please update my address information on DGCA records.*			

2.BAŞVURULAN ÖĞRETMENLİK YETKİSİ / APPLIED INSTRUCTOR RATING			
SP ME (Tek pilot Çok motor) *SP ME (Single Pilot Multi Engine)*	☐	**SP SE (Tek pilot Tek motor)** *SP SE (Single Pilot Single Engine)*	☐
Bu başvuru formu ve ekinde yer alan belge ve bilgilerin gerçek ve eksiksiz olduğunu beyan ederim. *I, hereby, confirm that all the information and documents given in this form and in its attachments are full and correct.*			
Tarih: *Date:*	.... / ... / 201..	**Başvuru Sahibinin İmzası:** *Signature of Applicant:*	

3. LİSANS BİLGİLERİ / *LICENCE PARTICULARS*			
Lisans Tipi: *Licence Type:*	ATPL / IR	**Lisans Numarası:** *Licence Number:*	TR-H-xxxxx
Sahip Olunan Tip Yetkileri: *Type Ratings included in the licence:*	A119		
	A139		
Sahip Olunan Diğer Yetkileri: *Other ratings included in the licence:*	IR		

4. UÇUŞ TECRÜBESİ / *PRE-REQUISITES FLIGHT EXPERIENCE*	SP ME	SP SE	SHGM
TOPLAM UÇUŞ SAATİ *Total Flying Hours*	.... **(En az 500 saat)** *(Min. 500 hours)*	.... **(En az 250 saat)** *(Min. 250 hours)*	
PIC SAATİ *PIC Hours*	.... **(En az 100 saat)** *(Min. 100 hours on SP ME Helicopters)*	-	
TİPTE TOPLAM UÇUŞ SAATİ *Total Flying Hours on Type*	.... **(En az 15 saat)** *(min. 15 hours)*	.... **(En az 15 saat)** *(min. 15 hours)*	

KAAN AIR

PART-FCL TİP YETKİSİ ÖĞRETMENİ – TRI(H) BAŞVURU VE YETENEK TESTİ SONUÇ FORMU
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5. TRI(H) KURSU ÖNCESİ UÇUŞ TESTİ / *PRE - ENTRY FLIGHT TEST FOR TRI(H) COURSE*			
.... Xxxx YYYYY ....'yı (adayın ismi), Tip Yetkisi Öğretmenliği kursuna öneriyorum. *(I recommend .... (name of applicant) for The Type Rating Instructor Course.)*			
OEO Adı: ATO Name:	KAAN HVCL	**Uçuş Testinin Tarihi:** *Flight Test Date:*	.... / ... / 201..
Uçuş Testi Yapan Uçuş Öğretmeninin Adı ve İmzası: *Name and signature of FI Conducting the Test:*			

6. TRI KURSU / TRI COURSE		
		SHGM
KURS SÜRESİ *Total Course Hours*	.... **SAAT/** *HOURS*	

7. ONAYLI EĞİTİM ORGANİZASYONU ONAYI / *APPROVAL OF ATO*			
Eğitim Müdürü olarak eğitimin PART-FCL ve onaylı eğitim el kitaplarına uygun olarak gerçekleştirildiğini, ve başvuranın belirtilen tipte TRI (H) yetenek testine girebilmek için gerekli bilgi ve yeteneğe sahip olduğunu onaylarım. *The Head of Training confirms that the training has been performed in compliance with PART-FCL and the approved training manuals, and that the applicant possesses all relevant knowledge and skills to take the TRI(H) skill test on the following type.*			
OEO Adı: *ATO Name:*	KAAN HVCL	**Tarih:** *Date:*	.... / ... / 201..
Eğitim Müdürünün Adı: *Name of HT:*	Xxxxxxx YYYYY TRE-H-xxxxx	**Eğitim Müdürünün İmzası ve Mühür:** *Signature and Seal of HT:*	

8. KONTROL PİLOTU / *FLIGHT EXAMINER*					
Sözlü Teorik Bilgi Sınavı: *Theoretical Oral Examination:*			**Uçuş Yetenek Testi:** *Flight Skill Test:*		
GEÇTİ *PASSED* ☐	**KALDI** *FAILED* ☐	**KISMEN GEÇTİ** PARTIAL PASS ☐	**GEÇTİ** *PASSED* ☐	**KALDI** *FAILED* ☐	**KISMEN GEÇTİ** PARTIAL PASS ☐
Tip Yetkisi öğretmen adayı test tekrarından önce ilave uçuş/teorik eğitim almalıdır. *I recommend further flight/ground training before re-test.* ☐					
Kontrol Pilotunun Adı: *Examiner Name:*			**İmza:** *Signature:*		
Lisans Türü ve Numarası: *Licence Title and Number:*			**Yer ve tarih:** *Location and date:* .... - .... / ... / 201..		

9. BAŞVURU TALİMATLARI / *APPLICATION PROCEDURES*	
Başvuru formu Sivil Havacılık Genel Müdürlüğü – Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA adresine teslim edilmelidir. Adaylar başvuru formuyla beraber ayrıca aşağıda belirtilen evrakları sunmalıdırlar. *Application form must be delivered to following address, Sivil Havacılık Genel Müdürlüğü - Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA. Documents listed below must be attached to this form.*	SHGM
— Pilot Lisansı / *Pilot Licence*	
— Geçerli Sağlık Sertifikası / *Valid Medical Certificate*	
— Uçuş Defteri Aslı ve İlgili Sayfaların Fotokopisi / *Logbook and Copy of Essential Pages*	
— Dekont / *Payment Reciept*	

10. SADECE SHGM KULLANIMI İÇİN /*DGCA USE ONLY*
Yukarıda belirtilen gerekliliklerin doğruluğu tarafımca kontrol edilmiştir. Shgm Yetkilisi İsim - İmza

KAAN AIR

PART-FCL TİP YETKİSİ ÖĞRETMENİ – TRI(H) BAŞVURU VE YETENEK TESTİ SONUÇ FORMU

(PART-FCL TYPE RATING INSTRUCTOR TRI(H) APPLICATION AND SKILL TEST RESULT FORM)

Testin Yürütülmesi

Content of the assesment of competence

• (1'den 6'ya kadar olan bölümlere bakınız.)

•Tüm öğretmenlikler için test formunun sözlü teorik bilgi testi bölümünü kapsayan 1'inci bölümü iki bölümden oluşur:

i) Öğretmen adayı 1'inci bölüm maddelerinden seçilecek bir konuda içlerinde kontrol pilotunun da bulunduğu diğer öğrencilere test şartları altında bir konferans verecektir. Bu testin hazırlık süresi için kontrol pilotu ile mutabık kalınmalıdır. Konferans sırasında öğretmen adayı tarafından uygun yayınlar ve dokümanlar kullanılabilir. Konferansın süresi 45 dakikayı aşmamalıdır.

ii) Aday test formunun 1'inci bölümünün maddeleri ile uçuş öğretmenliği kursundaki öğretme ve öğrenme konularını da kapsayan temel öğretmen yetkinliklerinden sözlü test yapılır.

•Testin 2, 3 ve 6'ncı bölümleri tüm öğretmenliklerde tatbik edilir. Bu bölümler, kontrol pilotu tarafından öğretmenlik kurs müfredatından seçilmiş (örnek, öğretmenlik yeteneğinin gösterildiği hareketler), öğretmen olabilmek için gerekli yeteneklerin sergilenmesine yönelik alıştırmaları kapsar. Öğretmen adayı, uçuş öğretmenliği yeteneğini uçuş öncesi brifing, uçuş eğitimi ve uçuş sonrası brifingi de içerecek şekilde sergilemelidir.

• 4'üncü bölüm çok motorlu uçaklarda öğretmenlik için ilave hareketlerin belirtildiği bölümdür. Bu bölüm eğer gerekiyorsa çok motorlu bir uçakta veya FFS veya ME uçağa benzetilebilir FNPT II' de uygulanır. Bu bölüm 2., 3, ve 6. bölüme ilave olarak tamamlanacaktır.

•5'inci bölüm öğretmenlere IR eğitim yetkisi için ilave hareketlerin belirtildiği bölümdür. Bu bölüm eğer gerekiyorsa hava aracında veya FFS veya FNPT II 'de alet uçuşu şartlarında uygulanılır. Bu bölüm 2., 3, ve 6. bölüme ilave olarak tamamlanacaktır.

KAAN AIR

PART-FCL TİP YETKİSİ ÖĞRETMENİ – TRI(H) BAŞVURU VE YETENEK TESTİ SONUÇ FORMU
(PART-FCL TYPE RATING INSTRUCTOR TRI(H) APPLICATION AND SKILL TEST RESULT FORM)

PART-FCL TİP YETKİSİ ÖĞRETMENİ TRI(H) YETENEK TESTİ ve SÖZEL TEORİK BİLGİ SINAVI FORMU
PART-FCL TYPE RATING INSTRUCTOR TRI(H) SKILL TEST and ORAL THEORETICAL KNOWLEDGE EXAMINATION FORM AMC3 FCL.935

Adayın Soyadı, Adı: *Candidate Surname, Name:* Xxxxxx YYYYYYY		**Lisans Türü ve Numarası:** *Title of Licence and Number:* TR-H-xxxxx	
Tarih: *Date:* ...... / ... / 201..	**Kalkış Yeri:** *Aerodrome:*	**Kalkış zamanı:** *Take-off time:*	**İniş zamanı:** *Landing time:*
Havaaracı/Simülatör Tescil İşareti: *Aircraft/SIM Registration:* TC-H..		**Havaaracı Tipi:** *Aircraft Type:* A139	

Bölüm 1 – SÖZLÜ TEORİK BİLGİ / *Section 1– THEORETICAL KNOWLEDGE ORAL*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
1.1	Hava Hukuku / *Air Law*		
1.2	Hava aracı Genel Bilgisi / *Aircraft General Knowledge*		
1.3	Uçuş Performans ve Planlama / *Flight Performance and Planning*		
1.4	İnsan Performansı ve Limitleri / *Human Performance and Limitations*		
1.5	Meteoroloji / *Meteorology*		
1.6	Seyrüsefer / *Navigation*		
1.7	İşletme Usulleri / *Operational Procedures*		
1.8	Uçuş Prensipleri / *Principles of Flight*		
1.9	Eğitim yönetimi / *Training Administration*		

BÖLÜM 2 VE 3 SEÇİLEN ANA HAREKETLERLE İLGİLİDİR / *SECTIONS 2 AND 3 SELECTED MAIN EXERCISES*			
Bölüm 2 – UÇUŞ ÖNCESİ HAZIRLIKLAR / *Section 2 – PRE-FLIGHT BRIEFING*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
2.1	Görsel sunum / *Visual Presentation*		
2.2	Teknik yeterlilik / *Technical Accuracy*		
2.3	Açıklamaların anlaşılırlığı / *Clarity of Explanation*		
2.4	Konuşmanın açıklığı / *Clarity of Speech*		
2.5	Öğretme tekniği / *Instructional of Techinque*		
2.6	Eğitim yardımcılarının kullanılması / *Use of Models and Aids*		
2.7	Öğrenci katılımı / *Student Participation*		
Bölüm 3 – UÇUŞ / *Section 3 – FLIGHT*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
3.1	Gösterinin düzenlenmesi / *Arrangement of Demo*		
3.2	Gösteri ile konuşmanın eş zamanlı olması / *Synchronisation of Speech with Demo*		
3.3	Hataların düzeltilmesi / *Correction of Faults*		
3.4	Helikopterin kullanımı / *Helicopter Handling*		
3.5	Öğretme tekniği / *Instructional Technique*		
3.6	Havacılığa yatkınlık/emniyet / *General Airmanship/Safety*		
3.7	Hava sahasında uygun pozisyonda bulunma / *Positioning Use of Airspace*		

KAAN AIR

PART-FCL TİP YETKİSİ ÖĞRETMENİ – TRI(H) BAŞVURU VE YETENEK TESTİ SONUÇ FORMU
(PART-FCL TYPE RATING INSTRUCTOR TRI(H) APPLICATION AND SKILL TEST RESULT FORM)

Bölüm 4 – ÇOK MOTOR HAREKETLERİ / *Section 5 – MULTI-ENGINE EXERCISES*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
4.1	*Kalkıştan sonra motor arızasında yapılacak işler **Actions following an Engine failure shortly after take-off*		
4.2	*Tek motor yaklaşma ve pas geçme **A single-engine approach and go around*		
4.3	*Tek motor yaklaşma ve iniş **A single-engine approach and landing*		
*Bu hareketler çok motor öğretmenlik yetkisi yetenek testinde yapılır. **These exercises are to be demonstrated at the assessment of competence for FI for ME*			

Bölüm 5 – ALETLİ UÇUŞ HAREKETLERİ / *Section 5 – INSTRUMENT EXERCISES*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
5.1	*HOLDING*		
5.2	*2D APPROACH*		
5.3	*3D APPROACH*		
5.4	*GO-AROUND*		
5.5			

Bölüm 6 – UÇUŞ SONRASI BRİFİNG / *Section 6 – POSTFLIGHT DE-BRIFING*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
6.1	Görsel sunum / *Visual Presentation*		
6.2	Teknik yeterlilik / *Technical Accuracy*		
6.3	Açıklamaların anlaşılırlığı / *Clarity of explanation*		
6.4	Konuşmanın açıklığı / *Clarity of speech*		
6.5	Öğretme tekniği / *Instructional Technique*		
6.6	Eğitim yardımcılarının kullanılması / *Use of models and Aids*		
6.7	Öğrenci katılımı / *Student Participation*		

SONUÇ / *RESULT*					
Sözlü teorik bilgi sınavı: *Theoretical oral examination:*			Uçuş yetenek testi: *Flight Skill Test:*		
GEÇTİ *Passed* ☐	KALDI *Failed* ☐	Kısmen Geçti: Partial Pass: ☐	GEÇTİ *Passed* ☐	KALDI *Failed* ☐	Kısmen Geçti: Partial Pass: ☐
Başvuru Sahibi Adı, No.su ve İmzası *Applicant's Name, No. and Signature*			*Xxxxxxx YYYY* *TR-H-xxxxx*		
Kontrol Pilotunun Adı, No.su ve İmzası *Examiner's Name, No. and Signature*					

NOTLAR:
NOTES:

APP-3 A FCL TYPE RATING INSTRUCTOR – TRI(H) REVALIDATION AND RENEWAL FORM

KAAN AIR

TİP YETKİSİ ÖĞRETMENİ – TRI(H) TEMDİT/YENİLEME FORMU
(TYPE RATING INSTRUCTOR TRI(H) REVALIDATION AND RENEWAL FORM)

1. KİŞİSEL BİLGİLER / *PERSONAL INFORMATION*			
Adayın Soyadı, Adı: *Applicant Surname, Name:*	BBBBB, Aaaaa		
Milliyeti: *Nationality:*	XX	Doğum Tarihi (gg/aa/yyyy): *Date of Birth (dd/mm/yyyy):*	00-00-19xx
Telefon No: *Phone Number:*	+90 532 111 22 33	E-Posta: *E-Mail:*	e-mail@kaanaiar.com
Adres: *Address:*	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx		
☐ SHGM kayıtlarındaki adres bilgilerimin güncellenmesini istiyorum. *Please update my address information on DGCA records.*			
Bu başvuru formu ve ekinde yer alan belge ve bilgilerin gerçek ve eksiksiz olduğunu beyan ederim. *I, hereby, confirm that all the information and documents given in this form and in its attachments are full and correct.*			
Tarih: *Date:*	.... / 0x / 202x	Başvuru Sahibinin İmzası: *Signature of Applicant:*	

2. LİSANS BİLGİLERİ / *LICENCE PARTICULARS*			
Lisans Tipi: *Licence Type:*	CPL/IR/ATPL	Lisans Numarası: *Licence Number:*	TRI-H-0xxxx
Sahip Olunan Tip Yetkileri: *Type Ratings included in the licence:*	A139 / IR, A119		
Sahip Olunan Diğer Yetkileri: *Other ratings included in the licence:*	TRI-H		

3.UÇUŞ ÖĞRETMENLİĞİ TAZELEME EĞİTİMİ / *FLIGHT INSTRUCTOR REFRESHER TRAINING*			
Eğitim tarihi: *(Date/s of seminar)*	xx - xx / 0x / 202x	Yeri : *(Place)*	KAAN AIR / ISTANBUL
a.	Eğitimi düzenleme sorumlusunun beyanı/ *Declaration by the responsible organiser*		
Yukarıdaki bilgilerin doğruluğunu ve Uçuş öğretmenliği tazeleme eğitiminin Otorite tarafından onaylandığı şekli ile uygulandığını onaylarım. *I certify that the above data are correct and that the Flight Instructor refresher training was carried out as approved by the authority.*			
Onay tarihi: *(Date of approval)*	xx / xx / 201x	Organizatörün adı: *(Name of organiser)(Block letter)*	KAAN AIR
Tarih ve Yer: *(Date and place)*	ISTANBUL xx / xx / 202x	İmzası: *(Signature)*	
b.	Başvuru sahibinin beyanı / *Declaration by the attendee*		
3. bölümdeki bilgilerin doğruluğunu onaylarım. (*I confirm the data under 3)*			
Başvuranın imzası: *Attendee's signature:*			

KAAN AIR

TİP YETKİSİ ÖĞRETMENİ – TRI(H) TEMDİT/YENİLEME FORMU
(TYPE RATING INSTRUCTOR TRI(H) REVALIDATION AND RENEWAL FORM)

4.TEMDİT/ *REVALIDATION* ☐			
***Aşağıdaki üç koşuldan ikisini yerine getirilmelidir /** *2 out of the 3 requirements below shall be fulfilled*			SHGM
	Uçuş Saati *Flight Time*	**Asgari Ger. Uçuş Saati** *Min. Req. Flight Time*	
a. Öğretmenlik imtiyazlarına sahip olduğu her hava aracı tipinde ya da bu tipleri temsil eden bir FSTD üzerinde, en az 15 saati TRI sertifikasının son geçerlilik tarihinden önceki 12 ay içerisinde olmak kaydıyla yapacağı uçuş . *- Hours of flight instruction on each of the types of aircraft for which instructional privileges are held or in an FSTD representing those types, of which at least 15 hours shall be within the 12 months preceding the expiry date of the TRI certificate.*	00:00 / 000:00	**50 SAAT /** *HOURS*	
b. TRI sertifikasının geçerlilik süresi içerisinde bir öğretmen tazeleme eğitimine katılım. *-Attend a TRI(H) refresher training within the validity period of the TRI(H) certificate.*	**Tarih /** *Date* xx - xx / 0x / 202x		
c. TRI sertifikasının son geçerlilik tarihi içerisinde FCL.935 uyarınca bir yetkinlik değerlendirmesinden geçmek. *-Pass an assessment of competence in accordance with FCL.935, within the validity period of the TRI(H) certificate.*	**Tarih /** *Date*		

4.YENİLEME/ *RENEWAL* ☐		
		SHGM
a. Bir ATO'da, TRI eğitim kursunun ilgili unsurlarını kapsayan bir öğretmen tazeleme eğitimi almış olmak . *-Receive instructor refresher training as a TRI at an ATO, which should cover the relevant elements of the TRI training course.*	**Tarih /** *Date* ...../...../......	
b. Yenileme başvurusundan önceki 12 ay içinde FCL.935 uyarınca bir yetkinlik değerlendirmesinden geçmek. *-Pass an assessment of competence in accordance with FCL.935, within 12 months preceding the application for renewal.*	**Tarih /** *Date* ...../...../......	

5. ONAYLI EĞİTİM ORGANİZASYONU ONAYI / *APPROVAL OF ATO*			
Eğitim Müdürü olarak eğitimin SHT-FCL ve onaylı eğitim el kitaplarına uygun olarak gerçekleştirildiğini ve başvuranın belirtilen tipte TRI yeterlilik testine girebilmek için gerekli bilgi ve yeteneğe sahip olduğunu onaylarım. *The Head of Training confirms that the training has been performed in compliance with SHT-FCL and the approved training manuals, and that the applicant possesses all relevant knowledge and skills to take the TRI proficiency test on the following type.*			
OEO Adı: *ATO Name:*	KAAN AIR ATO	**Tarih:** *Date:*	.... / 0x / 202x
Eğitim Müdürünün Adı: *Name of HT:*	Aaaaa BBBB TRE-H-0xxxx	**Eğitim Müdürünün İmzası ve Mühür:** *Signature and Seal of HT:*	

KAAN AIR

TİP YETKİSİ ÖĞRETMENİ – TRI(H) TEMDİT/YENİLEME FORMU

(TYPE RATING INSTRUCTOR TRI(H) REVALIDATION AND RENEWAL FORM)

6. BAŞVURU TALİMATLARI / *APPLICATION PROCEDURES*	
Başvuru formu Sivil Havacılık Genel Müdürlüğü – Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA adresine teslim edilmelidir. Adaylar başvuru formuyla beraber ayrıca aşağıda belirtilen evrakları sunmalıdırlar. *Application form must be delivered to following address, Sivil Havacılık Genel Müdürlüğü - Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA. Documents listed below must be attached to this form.*	**SHGM**
— Pilot Lisansı Fotokopisi / Copy of *Pilot Licence*	
— Geçerli Sağlık Sertifikası / *Valid Medical Certificate*	
— Uçuş Defteri Aslı ve İlgili Sayfaların Fotokopisi / *Logbook and Copy of Essential Pages*	
— Dekont / *Payment Reciept*	

7. SADECE SHGM KULLANIMI İÇİN / *DGCA USE ONLY*
Yukarıda belirtilen gerekliliklerin doğruluğu tarafımca kontrol edilmiştir. SHGM Yetkilisi İsim - İmza

KAAN AIR

TİP YETKİSİ ÖĞRETMENİ – TRI(H) TEMDİT/YENİLEME FORMU

(TYPE RATING INSTRUCTOR TRI(H) REVALIDATION AND RENEWAL FORM)

Kalkış Zamanı: Helikopterin motoru çalıştırılıp, pallerin dönmeye başladığı an.
Take-off Time: The moment that the helicopter engines start and blades start to rotate.
İniş Zamanı: Helipkopterin motoru susturulup, pallerin tam olarak durduğu an.
Landing Time: The moment the helicopter engines are shut down and the blades stops to rotate exactly.

TİP YETKİSİ UÇUŞ ÖĞRETMENİ TRI(H) YETKİNLİK DEĞERLENDİRMESİ FORMU
TYPE RATİNG INSTRUCTOR TRI(H) ASSESSMENT OF COMPETENCE FORM — AMC3 FCL.935

Adayın Soyadı, Adı: *Applicant Surname, Name:*		**Lisans Türü ve Numarası:** *Title of Licence and Number:*
Tarih: *Date:*	**Havaaracı Sınıfı/Tipi:** *Aircraft Class/Type:*	**Tescil:** *Registration:*
Ayrılış Meydanı: *Departure Aerodrome:*		**Varış Meydanı:** *Arrival Aerodrome:*
Kalkış zamanı: *Take-off time:*	**İniş zamanı:** *Landing time:*	**Toplam Uçuş Süresi:** *Total Flight Time:*

	Bölüm 1 – SÖZLÜ TEORİK BİLGİ / *Section 1– THEORETICAL KNOWLEDGE ORAL*	**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
a	Hava Hukuku / *Air Law*		
b	Hava aracı Genel Bilgisi / *Aircraft General Knowledge*		
c	Uçuş Performans ve Planlama / *Flight Performance and Planning*		
d	İnsan Performansı ve Limitleri / *Human Performance and Limitations*		
e	Meteoroloji / *Meteorology*		
f	Seyrüsefer / *Navigation*		
g	İşletme Usulleri / *Operational Procedures*		
h	Uçuş Prensipleri / *Principles of Flight*		
i	Eğitim yönetimi / *Training Administration*		

BÖLÜM 2 VE 3 SEÇİLEN ANA HAREKETLERLE İLGİLİDİR / *SECTIONS 2 AND 3 SELECTED MAIN EXERCISES*

	Bölüm 2 – UÇUŞ ÖNCESİ HAZIRLIKLAR / *Section 2 – PRE-FLIGHT BRIEFING*	**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
a	Görsel sunum / *Visual Presentation*		
b	Teknik yeterlilik / *Technical Accuracy*		
c	Açıklamaların anlaşılırlığı / *Clarity of Explanation*		
d	Konuşmanın açıklığı / *Clarity of Speech*		
e	Öğretme tekniği / *Instructional of Techinque*		
f	Eğitim yardımcılarının kullanılması / *Use of Models and Aids*		
g	Öğrenci katılımı / *Student Participation*		

	Bölüm 3 – UÇUŞ / *Section 3 – FLIGHT*	**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
a	Gösterinin düzenlenmesi / *Arrangement of Demo*		
b	Gösteri ile konuşmanın eş zamanlı olması / *Synchronisation of Speech with Demo*		
c	Hataların düzeltilmesi / *Correction of Faults*		
d	Helikopterin kullanımı / *Helicopter Handling*		
e	Öğretme tekniği / *Instructional Technique*		
f	Havacılığa yatkınlık/emniyet / *General Airmanship/Safety*		
g	Hava sahasında uygun pozisyonda bulunma / *Positioning Use of Airspace*		

KAAN AIR

TİP YETKİSİ ÖĞRETMENİ – TRI(H) TEMDİT/YENİLEME FORMU
(TYPE RATING INSTRUCTOR TRI(H) REVALIDATION AND RENEWAL FORM)

Bölüm 4 – ÇOK MOTOR HAREKETLERİ / *Section 5 – MULTI-ENGINE EXERCISES*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
a	*Kalkıştan sonra motor arızasında yapılacak işler **Actions following an Engine failure shortly after take-off*		
b	*Tek motor yaklaşma ve pas geçme **A single-engine approach and go around*		
c	*Tek motor yaklaşma ve iniş **A single-engine approach and landing*		
d			
e			
f			
g			
*Bu hareketler çok motor öğretmenlik yetkisi yetkinlik değerlendirilmesinde yapılır. **These exercises are to be demonstrated at the assessment of competence for instructors for ME aircraft.*			

Bölüm 5 – ALETLİ UÇUŞ HAREKETLERİ / *Section 5 – INSTRUMENT EXERCISES*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
a			
b			
c			
d			
e			
f			

Bölüm 6 – UÇUŞ SONRASI BRİFİNG / *Section 6 – POSTFLIGHT DE-BRIFING*		**BAŞARILI** *SUCCESSFUL*	**BAŞARISIZ** *FAILED*
a	Görsel sunum / *Visual Presentation*		
b	Teknik yeterlilik / *Technical Accuracy*		
c	Açıklamaların anlaşılırlığı / *Clarity of explanation*		
d	Konuşmanın açıklığı / *Clarity of speech*		
e	Öğretme tekniği / *Instructional Technique*		
f	Eğitim yardımcılarının kullanılması / *Use of models and Aids*		
g	Öğrenci katılımı / *Student Participation*		

SONUÇ / *RESULT*					
Sözlü Teorik Bilgi Sınavı: *Theoretical Oral Examination:*			**Uçuş Yetenek Testi:** *Flight Skill Test:*		
GEÇTİ *PASSED* ☐	**KISMEN GEÇTİ** *PARTIAL PASS* ☐	**KALDI** *FAILED* ☐	**GEÇTİ** *PASSED* ☐	**KISMEN GEÇTİ** *PARTIAL PASS* ☐	**KALDI** FAILED ☐
Uçuş öğretmen adayı test tekrarından önce ilave uçuş/teorik eğitim almalıdır. *I recommend further flight/ground training before re-test.* ☐					

KAAN AIR

TİP YETKİSİ ÖĞRETMENİ – TRI(H) TEMDİT/YENİLEME FORMU
(TYPE RATING INSTRUCTOR TRI(H) REVALIDATION AND RENEWAL FORM)

NOTLAR / *REMARKS:*

ADAY / *APPLICANT*	
Adı Soyadı / *Name and Surname:*	İmza ve Tarih / *Signature and Date:*
UÖ KONTROL PİLOTU / *FIE*	
Adı Soyadı ve Yetki Numarası / *Name Surname, Authorisation Number:*	İmza ve Tarih / *Signature and Date:*

APP-3 B ATPL(H) APPLICATION FORM

SHGM DGCA

HAVAYOLU NAKLİYE PİLOTU LİSANSI ATPL(H) BAŞVURU FORMU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(Airline Transport Pilot Licence ATPL(H) Skill Test and Proficiency Check Application and Report Form)

1. KİŞİSEL BİLGİLER / *PERSONAL INFORMATION*	
Adayın Soyadı, Adı: *Applicant Surname, Name:*	
Milliyeti: *Nationality:*	**Doğum Tarihi (gg/aa/yyyy):** *Date of Birth (dd/mm/yyyy) :*
Telefon No: *Phone Number:*	**E-Posta:** *E-Mail:*
Adres: *Address:* KAAN HAVACILIK SANAYİ VE TİCARET A.Ş. İstanbul / TURKEY ☐ **SHGM Kayıtlarındaki adres bilgilerimin güncellenmesini istiyorum.** *Please update my address information on DGCA records.*	
Bu başvuru formu ve ekinde yer alan belge ve bilgilerin doğru ve eksiksiz olduğunu beyan ederim. *I, hereby, confirm that all the information and documents given in this form and in its attachments are full and correct.*	
Tarih: *Date:* ...... / ...... / 202...	**Başvuru Sahibinin İmzası:** *Signature of Applicant:*

2. UÇUŞ TECRÜBESİ VE KOŞULLAR / *FLIGHT EXPERIENCE AND REQUIREMENTS*			**SHGM**
a. Helikopterlerde toplam uçuş süresi. *Total helikopter flying time.*		**MİN.1000 SAAT**	
b. FFS / FNPT uçuş süresi ([a] maddesinin içinde) *FFS / FNPT flying hours (included in section [a])*		**MAX. 100 / 25 SAAT**	
c. Çok pilotlu operasyonlarda uçulan süre. *Total flight time in multi-pilot operations .*		**MİN. 350 SAAT**	
d. En az 250 saat PIC uçuş süresi veya / *Min. 250 hours flying time as PIC or*		**MİN. 250 SAAT**	
En az 100 saat PIC ve en az 150 saat PICUS veya/ *Min. 100 hours of PIC and 150 hours of PICUS or*		**MİN. 100 SAAT** **MİN. 150 SAAT**	
Çok pilotlu helikopterlerde En az 250 saat PICUS / *Min. 250 hours of PICUS on multi pilot helicopters..*		**MİN. 250 SAAT**	
e. Gece uçuş süresi (PIC veya co-pilot). *Night flying time (PIC or co-pilot).*		**MİN. 100 SAAT**	
e.S/S uçuş saati (PIC veya PICUS)- En az 100 saati PIC veya PICUS olarak. *Cross-country flight time (PIC or PICUS)- Of which at least 100 hours shall be as PIC or as PICUS*		**MİN. 200 SAAT**	
f. Aletli uçuş süresi (IR)- Bu sürenin en fazla 10 saati aletli yer süresi olabilir. *IFR flight time – At most 10 hours of this may be instrumented ground time.*		**MİN. 30 SAAT** **MAX. 10 SAAT**	
g. Onaylı MCC kursu veya çok motorlu/çok pilotlu operasyonlarda uçuş tecrübesi. *Hold an approved MCC course or have min flight experience in multi-pilot operations.*		**MİN. 500 SAAT**	
h. Minimum 21 yaş koşulu. *At least 21 years old requirement.*			
ı. Adayın CPL(H) lisansa sahip olması. *Hold a CPL(H) licence.*			
i.Geçerli sağlık sertifikası (Class 1). *Valid medical certificate Class 1.*			
j. Geçerli dil yeterliliği (en az ICAO-Level-4). *Valid language proficiency (at least ICAO level-4).*			
k. Geçerli ATPL(H) teorik bilgisi. *Valid ATPL(H) theory credit.*			

HAVAYOLU NAKLİYE PİLOTU LİSANSI ATPL(H) BAŞVURU FORMU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

(Airline Transport Pilot Licence ATPL(H) Skill Test and Proficiency Check Application and Report Form)

3. BAŞVURU TALİMATLARI / *APPLICATION PROCEDURES*	
Bu başvuru formu Sivil Havacılık Genel Müdürlüğü – Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA adresine ulaştırılmalıdır. Adaylar başvuru formuyla beraber ayrıca aşağıda belirtilen evrakları sunmalıdırlar. *Application form must be delivered to following address, Sivil Havacılık Genel Müdürlüğü – Gazi Mustafa Kemal Bulvarı No:128/A 06570 Maltepe / ANKARA. Documents listed below must be attached to this form.*	
	SHGM
ATPL Yetenek Testi Sonuç Formu / *ATPL Skill Test Report Form*	
Geçerli 1. Sınıf Sağlık Sertifikası Fotokopisi / *Copy of Valid 1st Class Medical Certificate*	
Mevcut Lisansının Fotokopisi / *Copy of Your Current Licence*	
Teorik Bilgi Eğitimi Sınav Sonuç Belgesi / *Theoretical Knowledge Examination Result Form*	
Uçuş Kayıt Defteri Aslı ve İlgili Sayfaların Fotokopisi / *Logbook and Copy of Related Pages*	
Dekont / *Payment Reciept*	

4. SADECE SHGM KULLANIMI İÇİN / *DGCA USE ONLY*
Yukarıda belirtilen gerekliliklerin doğruluğu tarafımca kontrol edilmiştir. SHGM Yetkilisi İsim - İmza

SHGM DGCA

HAVAYOLU NAKLİYE PİLOTU LİSANSI ATPL(H) BAŞVURU FORMU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

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Kalkış Zamanı: Helikopterin motoru çalıştırılıp, pallerin dönmeye başladığı an.
Take-off Time: The moment that the helicopter engines start and blades start to rotate.
İniş Zamanı: Helipkopterin motoru susturulup, pallerin tam olarak durduğu an.
Landing Time: The moment the helicopter engines are shut down and the blades stops to rotate exactly.

ATPL(H) Yetenek Testi/Yeterlilik Kontrolü Sonuç Formu
ATPL(H) Skill Test/Proficiency Check Result Form
(Reference: PART–FCL APPENDIX-9)

Başvuranın Soyadı, Adı: *Applicant's Surname, Name:*		**Lisans Türü ve Numarası:** *Title of Licence and Number:*			
Tarih: *Date:*	**Kalkış Yeri:** *Aerodrome:*	***Havaaracı/Simülatör Tescil İşareti:*** *Aircraft/SIM Registration:*			
Kalkış zamanı: *Take-off time:*	**İniş zamanı:** *Landing time:*	**Toplam Uçuş Süresi:** *Total Flight Time:*			
Havaaracı Tipi: *Aircraft Type:*		**Yetenek testi:** *Skill test:*	☐	**Yeterlilik Kontrolü:** *Proficiency check:*	☐

		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
Manevralar/Usuller *Manoeuvres/Procedures*		Practical training performed in			Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	*FFS*	*H*		*FFS, H*	
BÖLÜM 1 Uçuş Öncesi Hazırlıkları ve Kontrolleri ***SECTION 1 Pre-flight preparation and checks***							
1.1	Helikopterin harici kontrollerinin yapılması parçaların yerlerinin ve fonksiyonlarının incelemesi. *Helicopter exterior visual inspection; location of each item and purpose of inspection.*			P		M (if performed in the helicopter) (helikopterde yapılması halinde)	
1.2	Kokpit kontrolü *Cockpit inspection*		P	---->		M	
1.3	Çalıştırma prosedürleri, radyo ve seyrüsefer ekipmanı kontrolü, seyrüsefer ve haberleşme frekanslarının seçilmesi ve ayarlanması. *Starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies*	P	---->	---->		M	
1.4	Hava trafik kontrol talimatlarına veya öğretmenin talimatlarına uygun olarak taksi yapma/havır yapma *Taxiing/air taxiing in compliance with air traffic control instructions or with instructions of an instructor*		P	---->		M	
1.5	Kalkış öncesi prosedürleri ve kontrolleri *Pre take-off procedures*	P	---->	---->		M	

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		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
Manevralar/Usuller *Manoeuvres/Procedures*		Practical training performed in			Eğitim tamamlan-dığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığın da kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	*FFS*	*H*		*FFS, H*	
BÖLÜM 2 Uçuş Manevraları ve Usulleri ***SECTION 2 Flight manoeuvres and procedures***							
2.1	Kalkışlar (çeşitli profiller). *Take-offs (various profiles)*		P	---->		M	
2.2	Yamaç ve yan rügarında kalkışlar ve inişler *Sloping ground or crosswind take-offs & landings*		P	---->			
2.3	Azami kalkış ağırlığında kalkış (gerçek veya benzetilmiş azami kalkış ağırlığı). *Take-off at maximum take-off mass (actual or simulated maximum take-off mass)*	P	---->	---->			
2.4	Kalkışta TDP'ye veya DPATO'ya ulaşmadan hemen önce benzetilmiş motor arızası ile kalkış. *Take off with simulated engine failure shortly before reaching TDP or DPATO*		P	---->		M	
2.4.1	TDP'ye veya DPATO'ya ulaştıktan hemen sonra benzetilmiş motor arızası ile kalkış. *Take off with simulated engine failure shortly after reaching TDP or DPATO*		P	---->		M	
2.5	Belirtilmiş istikametlere tırmanışlı ve süzülüşlü dönüşler. *Climbing and descending turns to specified headings*	P	---->	---->		M	
2.5.1	Sadece aletler referans alınarak 30°yatışlarla, sola ve sağa 180° ila 360° lik dönüşler.. *Turns with 30 degrees bank, 180 degrees to 360 degrees left and right, by sole reference to instruments*	P	---->	---->		M	
2.6	Otorotatif süzülüş. *Autorotative descent*	P	---->	---->		M	
2.6.1	Yere kadar otorotatif iniş (sadece SEH) veya güçlü kurtarma. *Autorotative landing (SEH only) or power recovery*		P	---->		M	
2.7	İnişler, çeşitli profillerde. *Landings, various profiles*		P	---->		M	
2.7.1	Yaklaşmada LDP veya DPBL öncesinde benzetilmiş motor arızası sonrasında pas geçme veya iniş. *Go around or landing following simulated engine failure before LDP or DPBL*		P	---->		M	

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(Airline Transport Pilot Licence ATPL(H) Skill Test and Proficiency Check Application and Report Form)

		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
Manevralar/Usuller *Manoeuvres/Procedures*		Practical training performed in			Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	*FFS*	*H*		*FFS, H*	
2.7.2	Yaklaşmada LDP veya DPBL sonrasında benzetilmiş motor arızası ile iniş. *Landing following simulated engine failure after LDP or DPBL*		P	---->		M	
BÖLÜM 3 Normal ve anormal durumlarda aşağıdaki sistem ve prosedürlerin kullanımı: **SECTION 3 Normal and abnormal operations of the following systems and procedures:**							
3	Aşağıdaki sistem ve prosedürlerin normal ve anormal hallerde kullanımı: *Normal and abnormal operations of the following systems and procedures:*					M	*(Bu bölümden asgari 3 unsur zorunlu olarak seçilecektir.) (A mandatory minimum of 3 items shall be selected from this section)*
3.1	Motor *Engine*	P	---->	---->			
3.2	Klima (ısıtma, havalandırma) *Air conditioning (heating, ventilation)*	P	---->	---->			
3.3	Pitostatik sistem *Pitot/static system*	P	---->	---->			
3.4	Yakıt Sistemi *Fuel System*	P	---->	---->			
3.5	Elektrik sistemi *Electrical system*	P	---->	---->			
3.6	Hidrolik sistem *Hydraulic system*	P	---->	---->			
3.7	Uçuş kontrol ve Trim sistemi *Flight control and Trim-system*	P	---->	---->			
3.8	Buzlanmayı önleyici ve buzlanmayı giderici sistemler *Anti-icing and de-icing system*	P	--->	---->			
3.9	Otomatik Pilot / Uçuş yönlendiricisi *Autopilot/Flight director*	P	---->	---->			
3.10	Stabilizasyon cihazları *Stability augmentation devices*	P	---->	---->			
3.11	Meteoroloji radarı, radyo altimetre, transponder *Weather radar, radio altimeter, transponder*	P	---->	---->			
3.12	Saha Seyrüsefer Sistemi *Area Navigation System*	P	----->	---->			
3.13	İniş takımı sistemi *Landing gear system*	P	---->	---->			

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(Airline Transport Pilot Licence ATPL(H) Skill Test and Proficiency Check Application and Report Form)

		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
Manevralar/Usuller *Manoeuvres/Procedures*		Practical training performed in			Eğitim tamamlan-dığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	*FFS*	*H*		*FFS, H*	
3.14	Yardımcı güç ünitesi (APU) *Auxiliary power unit*	P	---->	---->			
3.15	Radyo, seyrüsefer ekipmanı, aletler, uçuş idare sistemi *Radio, navigation equipment, instruments flight management system*	P	---->	---->			
BÖLÜM 4 Anormal ve Acil Durum Prosedürleri ***SECTION 4 Abnormal and emergency procedures***							
4	Anormal haller ve acil durum prosedürleri *Abnormal and emergency procedures*					M	Bu bölümden asgari 3 unsur zorunlu olarak seçilecektir. *A mandatory minimum of 3 items shall be selected from this section*
4.1	Yangın tatbikatları (tatbik edilebilmesi halinde tahliye dahil) *Fire drills (including evacuation if applicable)*	P	---->	---->			
4.2	Duman kontrolü ve giderme *Smoke control and removal*	P	---->	---->			
4.3	Motor arızaları, emniyetli bir irtifada motor durdurma ve yeniden çalıştırma *Engine failures, shut down and restart at a safe height*	P	---->	---->			
4.4	Yakıt boşaltma (benzetilmiş) *Fuel dumping (simulated)*	P	---->	---->			
4.5	Kuyruk rotoru kumanda arızaları (tatbik edilebilmesi halinde) *Tail rotor control failure (if applicable)*	P	---->	---->			
4.5.1	Kuyruk rotoru güç kaybı (tatbik edilebilmesi halinde) *Tail rotor loss (if applicable)*	P	---->	Bu egzersiz için helikopter kullanılmaya bilir *Helicopter may not be used for this exercise*			
4.6	Uçuş ekibi üyesinin iş görmez olması - sadece MPH *Incapacitation of crew member – MPH only*	P	---->	---->			
4.7	Güç aktarma arızaları *Transmission malfunctions*	P	---->	---->			

HAVAYOLU NAKLİYE PİLOTU LİSANSI ATPL(H) BAŞVURU FORMU VE YETENEK TESTİ/YETERLİLİK KONTROLÜ SONUÇ FORMU

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Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training* Practical training performed in FTD	FFS	H	Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check* Kontrol Ortamı *Chkd. in* *FFS, H*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
4.8	Uygun Uçuş El Kitabında belirtilen diğer acil durum prosedürleri *Other emergency procedures as outlined in the appropriate Flight Manual*	P	---->	---->			
BÖLÜM 5 Aletli Uçuş Usulleri (IMC veya benzetilmiş IMC'de icra edilecektir) **SECTION 5 Instrument Flight Procedures (to be performed in IMC or simulated IMC)**							
5.1	Alet kalkışı: kalkıştan sonra mümkün olan en kısa sürede aletli uçuşa geçiş gerekir. *Instrument take-off: transition to instrument flight is required as soon as possible after becoming airborne*	P*	---->*	---->*			
5.1.1	Ayrılış (Hareket) sırasında benzetilmiş motor arızası *Simulated engine failure during departure*	P*	---->*	---->*		M*	
5.2	Ayrılış (hareket) ve varış rotalarına ve ATC talimatlarına uyum. *Adherence to departure and arrival routes and ATC instructions*	P*	---->*	---->*		M*	
5.3	Bekleme usulleri *Holding Procedures*	P*	---->*	---->*			
5.4	CAT I karar yüksekliğine ILS yaklaşmaları, *ILS approaches down to CAT I decision height*	P*	---->*	---->*			
5.4.1	Manuel olarak, uçuş yönlendiricisi olmadan *Manually, without flight director.*	P*	---->*	---->*		M*	
5.4.2	Uçuş yönlendirici ile veya uçuş yönlendirici olmadan manuel olarak *Manually, with Flight Director*	P*	---->*	---->*		M*	
5.4.3	Otomatik pilot bağlanmış olarak *With coupled autopilot*	P*	---->*	---->*			
5.4.4	Manuel olarak, benzetilmiş gayrifaal bir motor ile. (Motor arızası son yaklaşmada dış markeri (OM) geçme öncesinden teker koymaya kadar veya tam pas geçme usulü boyunca benzetilmelidir) *Manually, with one engine simulated inoperative.(Engine failure has to be simulated during final approach before passing (OM) until touchdown or until completion of the missed approach procedures)*	P*	---->*	---->*		M*	
5.5	Asgari alçalma irtifasına kadar hassas olmayan yaklaşma MDA/H *Non-precision approach down to the minimum descent altitude MDA/H*	P*	---->*	---->*		M*	
5.6	DA/DH veya MDA/MDH'ye varmadan önce tüm motorlar çalışır halde pas geçme *Go-around with all engines operating on reaching DA/DH or MDA/MDH*	P*	---->*	---->*			

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(Airline Transport Pilot Licence ATPL(H) Skill Test and Proficiency Check Application and Report Form)

Manevralar/Usuller *Manoeuvres/Procedures*		UYGULAMALI EĞİTİM *Practical Training*				YETENEK TESTİ VEYA YETERLİLİK KONTROLÜ *Skill Test/ Proficiency Check*	
		Practical training performed in			Eğitim tamamlandığında öğretmenin parafı *Instructor's initials when training completed*	Kontrol Ortamı *Chkd. in*	Test tamamlandığında kontrol pilotunun parafı *Examiner initials when test completed*
		FTD	*FFS*	*H*		*FFS, H*	
5.6.1	Diğer pas geçme usulleri *Other missed approach procedures*	P*	---->*	---->*			
5.6.2	DA/DH veya MDA/MDH'ye varmadan benzetilmiş tek motor arızasında pas geçme *Go-around with one engine simulated inoperative on reaching DA/DH or MDA/MDH*	P*				M*	
5.7	IMC'de güçlü kurtarma ile otorotasyon *IMC autorotation with power recovery*	P*	---->*	---->*		M*	
5.8	Anormal durumlardan kurtarma *Recovery from unusual attitudes*	P*	---->*	---->*		M*	
BÖLÜM 6 İlave Ekipmanın Kullanımı ***SECTION 6 Use of Optional equipment***							
6	İlave ekipmanın kullanımı *Use of optional equipment*	P	---->	---->			

SONUÇ / *RESULT*		
GEÇTİ *PASSED* ☐	**KISMEN GEÇTİ** *PARTIALLY PASSED* ☐	**KALDI** *FAILED* ☐
NOTLAR / *REMARKS:*		

LİSANSINDA TÜRKÇE DİL YETERLİLİĞİ BULUNMAYAN ADAYLAR İÇİN; *FOR THE APPLICANTS WHO HASN'T GOT THE TURKISH LANGUAGE PROFICIENCY LEVEL;*		
SEVİYE 6 *LEVEL 6* ☐	**DEĞERLENDİRİLMEDİ** *NOT EVALUATED* ☐	**YETERLİ DEĞİL** *INADEQUATE* ☐

ADAY / *APPLICANT*	
Adı Soyadı / *Name and Surname:*	**İmza ve Tarih /** *Signature and Date:* .... / ...... / 202...

KONTROL PİLOTU / *EXAMINER*		
Adı Soyadı / *Name and Surname:*	**Yetki Numarası /** *Authorisation Number:*	**İmza ve Tarih /** *Signature and Date:* .... / ...... / 202...

APP-4 COURSE COMPLETION CERTIFICATE


CERTIFICATE

Aaaaa BBBBB

TR.FCL.H.oxxxx

Has satisfactorily completed the course mentioned below;

Between 0x / 0x / 202x – xx / 0x / 202x,

In Istanbul/TURKIYE and Helsinki/FINLAND.

A1xx / IR Pilot Type Rating

Theoretical, Synthetic & Flight Course

According to AMC2 FCL.725 (a) / (d), (e)

KAAN HAVACILIK SAN. ve TIC. A. S.

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info@kaanair.com

Aaaaa BBBB	Aaaaa BBBBB
ATO Head of Training	**Accountable Manager**

KAAN AIR

Certificate # : KHC-202x-0xx-TYPE/A1xx-0x

Date : xx.0x.202x

TOF-04 / REV-4 / 01.02.2020

APP-5 FLIGHT AND FLIGHT DUTY TIME APPLICATION AND RECORD PROCEDURES

PURPOSE

The purpose of this procedure is to record the flight and flight duty times at KAAN ATO, and to determine the procedure for filling out and keeping the registration form.

SCOPE

This procedure covers ATO instructor/examiner, flight planner and ATO Head of Training and trainees receiving training.

APPLICATION AND RESPONSIBILITIES

The ATO Head of Training is responsible for the implementation of this procedure on behalf of the Instructor/Examiner Pilots, Flight Planning Officer, Trainees and the Responsible Manager.

The Flight and Flight Duty Periods Registration Form is used to record the flight and flight duty times.

Flight and flight duty times are recorded, and the duty and flight times of the flight personnel are evaluated in line with the principles of DGCA.

Filled/filling flight and flight duty time registration forms are kept digitally in the computer.

ATO personnel, instructors and students are responsible to the General Directorate for the fulfillment and control of the requirements in the instruction.

ATO Responsibilities

- **a.** Consider the relationship between flight duty periods and the frequencies and forms of rest periods. It will consider the impact that long assignments with minimal rest will have on team members.
- **b.** Plan the day-offs and inform the instructor and students at least 24 hours in advance.
- **c.** Provide crew members with rest periods of sufficient time to allow to overcome the effects of previous assignments and be rested by the start of the next Flight Duty Period.
- **d.** Publish task schedules to allow crew members to plan adequate rest.
- **e.** Plan the flight missions within the permitted Flight Duty Period, considering the time required for pre-flight duties, sector, turn-around times.

Instructor / Student Responsibilities

- **a.** They will make optimal use of the opportunities and facilities regarding the rest and will plan and use the rest periods appropriately.
- **b.** They will not be in charge of the aircraft when he is overtired.
- **c.** Each pilot will follow his own Duty, Flight, and Flight Duty Times registration form via Administrative Personnel.
- **d.** The form must be filled within 3 working days, excluding public holidays.
- **e.** Duty, Flight and Flight Duty Periods record form is retained for 24 months. Each pilot is responsible for maintaining this form and displaying it when requested.
- **f.** Change suggestions regarding this method are made to the Compliance Monitoring Manager. The suggestions made are forwarded to the Accountable Manager and necessary evaluations are made.

RELATED FORMS

Forms

Flight and Flight Duty Period Follow-Up sheet FOF-09 is on the next page.

APP-5-1 FLIGHT AND FLIGHT DUTY TIME RECORD FORM

KAAN AIR

KAAN HAVACILIK SANAYI TICARET A.S.

DUTY (DT) - FLIGHT DUTY (FDP) - REST PERIOD (RP) FOLLOW UP SHEET

NAME SURNAME : SEYİT EMRAH CANBAZGİL HOME BASE : ISTANBUL LICENSE NO : ATPL(H) TR.FCL.H.10945

MONTH	DAY		DUTY TIME (Incl. Sim) 2021 START (Z)	FINISH (Z)	TIME LAPSE	STAND BY DUTY	Home Hotel Max Stby.16	DAY OFF	STAY AT OTHER BASE (City)	REST PERIOD (RP) min; 1 x 30:00 in 7 Day (30:00)	DT (DUTY TIME) 7 D	14 D	28 D	YEAR	FT FLIGHT TIME (Types) A139				LANDING	NOTE	FT (FLIGHT TIME) DAILY	7 D	28 D	12 MO	FDP FLIGHT DUTY PERIOD -60' HLK +0' -60' SIM +0' START (Z)	FINISH (Z)	OPS TYPE (AIRTAX, GENAV, ATO)	SPLIT DUTY	TOTAL BREAK	FDP / DAILY	SUMMARY	
										Home->12 or DT Oth-> 10 or DT RP - 2 > 10 RP--> +(-RP) x2 +SKPK -RP /NO	60:00	110:00	190:00	2000:00							05:00 L->S.5, M.6 06:00 L->S.6, M.7 14:00 L->S.5, M.6 21:00 L->S.4, M.5 GENAV ->S.5, M.7 ATO->TRI/TRE.6 NAV.6 TYP.4 SIM.4	30:00	90:00	1000:00				FDP + ? 01:30.. 04:00..	10+ LAND MIN 30 SLING LOAD MIN 30	+2 HR +SKPK +SPLIT D /2 +BREAK /2 - STBY >4, HOM/OTH.STBY>6(8) 05:00 L->S.10, M.11 06:00 L->S.10, M.12 14:00 L->S.10, M.11 21:00 L->S.9, M.10 Genav->S10,M12,ATO->12 STBY+->16		
DECEMBER	1		03:54	08:23	04:29		04:29		LTBA	30:37	13:12	44:56	54:18	487:46	02:59					OFFSHORE	02:59	06:12	24:38	180:24	03:54	07:53				03:59	12	DAY OFF
	2		15:00	05:00	14:00	X	03:30		LTBA	24:00	14:47	37:55	56:02	491:16								05:47	24:22	180:24								
	3							X	LTBA		14:47	34:29	56:02	491:16								05:47	24:22	180:24							WEEK 49	3
	4	ST	05:00	15:00	10:00	X	02:30		LTBA	33:00	12:59	36:59	58:32	493:46								02:59	24:22	180:24								
	5	SU						X	LTBA		10:29	34:29	58:32	493:46								02:59	24:22	180:24							50	7
	6							X	LTBA	28:15	10:29	31:59	54:29	493:46								02:59	22:43	180:24								
	7		04:15	09:20	05:05		05:05		LTBA	19:04	15:34	32:48	56:01	498:51	03:25					OFFSHORE	03:25	06:24	24:05	183:49	04:15	08:40				04:25	51	5
	8		04:24	13:25	09:01		09:01		LTBA	14:44	20:06	33:18	65:02	507:52	06:23					OFFSHORE	06:23	09:48	30:28	190:12	04:24	12:55				08:31		
	9		04:09	12:33	08:24		08:24		LTBA	35:27	25:00	39:47	73:26	516:16	05:56					OFFSHORE	05:56	15:44	36:24	196:08	04:09	12:03				07:54	52	4
	10							X	LTBA		25:00	39:47	73:26	516:16								15:44	36:24	196:08								
	11	ST						X		24:00	22:30	35:29	73:26	516:16						Home		15:44	36:24	196:08							TOTAL	19
	12	SU						X		24:00	22:30	32:59	73:26	516:16						Home		15:44	36:24	196:08								
	13							X		24:00	22:30	32:59	73:26	516:16						Home		15:44	36:24	196:08								
	14							X		24:00	17:25	32:59	73:26	516:16						Home		12:19	36:24	196:08								
	15							X		24:00	08:24	28:30	73:26	516:16						Home		05:56	36:24	196:08								
	16							X		24:00		25:00	62:55	516:16						Home			32:50	196:08								
	17							X		24:00		25:00	59:29	516:16						Home			30:54	196:08								
	18	ST						X		24:00		22:30	59:29	516:16						Home			30:54	196:08								
	19	SU						X		24:00		22:30	56:59	516:16						Home			30:54	196:08								
	20							X		24:00		22:30	54:29	516:16						Home			30:54	196:08								
	21							X		29:30		17:25	50:13	516:16						Home			28:08	196:08								
	22		05:30	12:00	06:30		06:30		KAAN	19:10	06:30	14:54	48:12	522:46						AyhanS A139 Ground Training			21:56	196:08								
	23		07:10	10:35	03:25		03:25		KAAN	42:25	09:55	09:55	49:42	526:11	02:05					AyhanS -ATPL+TRE Check	02:05	02:05	23:36	198:13	07:10	10:05				02:55		
	24							X	LTBA		09:55	09:55	49:42	526:11								02:05	23:36	198:13							YEARLY	276
	25	ST	05:00	15:26	10:26	X	04:06		LTBA	13:34	14:01	14:01	49:30	530:17	00:30					Maintenance Ferry	00:30	02:35	21:18	198:43	13:26	14:56				01:30		
	26	SU	05:00	15:00	10:00	X	02:30		LTBA	13:07	16:31	16:31	49:30	532:47								02:35	21:18	198:43								
	27		04:07	08:35	04:28		04:28		LTBA	39:25	20:59	20:59	53:58	537:15	02:58					OFFSHORE	02:58	05:33	24:16	201:41	04:07	08:05				03:58		
	28							X	LTBA		20:59	20:59	53:58	537:15								05:33	24:16	201:41								
	29							X	LTBA	28:41	14:29	20:59	49:29	537:15								05:33	21:17	201:41								
	30		04:41	09:20	04:39		04:39		LTBA	38:40	15:43	25:38	50:38	541:54	02:59					OFFSHORE	02:59	06:27	24:16	204:40	04:41	08:40				03:59	MONTH FT	27:15
	31							X	LTBA		15:43	25:38	50:38	541:54								06:27	24:16	204:40								
								277	130						204:40				0		204:40											

APP-6 REFRESHMENT TRAINING EVALUATION FORM

TİP / SINIF / ALETLİ UÇUŞ YETKİLERİNİN YENİLENMESİ İÇİN DEĞERLENDİRME / TAZELEME EĞİTİMİ FORMU

(Assessment / Refresher Training Form For Type / Class / Instrument Rating(s) Renewal)

KAAN AIR

1. KİŞİSEL BİLGİLER / *Personal Information*			
Başvuranın Adı ve Soyadı: *Applicant's Name and Surname:*	Aaaaa BBBBBB		
Lisans Numarası: *Licence number:*	TR.FCL.H.XXXXX	**T.C. Kimlik No:** *ID Number:*	12345678910
Telefon No: *Phone Number:*	+90 53x xxx xx xx	**E-Posta:** *E-Mail:*	aaaaa@kaanair.com
Yenilenmesi Talep Edilen Yetki/Yetkiler: *Rating(s) Requested to Renew:*	Axxxx		
Bu formda yer alan bilgilerin doğru ve eksiksiz olduğunu beyan ederim. *I, hereby, confirm that all the information given in this form are full and correct.*			
Tarih: *Date:* / / 202…		**Başvuranın İmzası:** *Signature of Applicant:*	

2. ÖN DEĞERLENDİRME / *Pre-Entry Assessment*

Taking into consideration that;

Experience of the applicant: TT xxxx:00 , Axxx Type FH xxxx:00

Time has passed from expiry date: Last Flight on Yy.Yy.202x ; (X Years Y Months)

Complexity of aircraft: YES / NO

If applicant has an another valid licence Axxxx FH xxxx:00

FSTD Assessment:

AND THE RESULT OF THIS ASSESSMENT

☐ No Refresher Training Required

☐ Refresher Training Required;

We propose to attend XX *hours /* x *sessions Theoretical Knowledge Training,*

xx:xx *sessions A/C Training,*

X *sessions Simulator Training.*

Aaaaaaaa BBBBB
TRI-TR.FCL.H.xxxxxx

NAME,SURNAME AND SIGNATURE OF THE ASSESSOR
(HEAD OF TRAINING OR EXAMINER)

TOF-14 / REV-1 / 23.04.2024
(Re-designed via SHGM-FR.191)

TİP / SINIF / ALETLİ UÇUŞ YETKİLERİNİN YENİLENMESİ İÇİN DEĞERLENDİRME / TAZELEME EĞİTİMİ FORMU

(Assessment / Refresher Training Form For Type / Class / Instrument Rating(s) Renewal)

KAAN AIR

3. EĞİTİMİN İÇERİĞİ / *Content Of The Training (if needed)*

(a) THEORETICAL KNOWLEDGE DETAILS *(if needed):*

XX *Hours /* XX *Session*

Theoretical knowledge examination pass mark (%): XX *Date:* / / 202…

(b) FLIGHT DETAILS *(if applicable):*

The training consisted of ………………. hours of flight instruction of which ………………. hours consisted of synthetic flight instruction in a FNPT I or FNPT II/III or FTD 2/3 or FFS.

(1) FSTD Details *(if needed):*

FSTD Identification Number: FI-1H-…… *Date Training commenced:* / / 202…

Flight Time : xx:xx *Date Training completed:* / / 202…

(2) Aircraft Details *(if needed):*

Aircraft Registration: TC-H…… *Date Training commenced:* / / 202…

Flight Time : xx:xx *Date Training completed:* / / 202…

Recommended for Check by:

Aaaaaaaa BBBBB
TRI-TR.FCL.H.xxxxxx

NAME,SURNAME AND SIGNATURE OF THE INSTRUCTOR

4. ONAYLI EĞİTİM ORGANİZASYONUNUN ONAYI / *APPROVAL OF ATO*

Eğitim Müdürü olarak tazeleme eğitimin SHT-FCL ve onaylı eğitim el kitaplarına uygun olarak gerçekleştirildiğini, ve başvuranın belirtilen tip/sınıf/aletli uçuş yetkisi yeterlilik kontrolüne girebilmek için gerekli bilgi ve yeteneğe sahip olduğunu onaylarım.
The Head of Training confirms that the refresher training has been performed in compliance with SHT-FCL and the approved training manuals, and that the applicant possesses all relevant knowledge and skills to take the proficiency check on the type/class/instrument rating.

ATO Adı: *ATO Name:* KAAN HAVACILIK A.S	**Yetki Numarası:** *Approval Number:* TR.ATO.015
Eğitim Müdürünün Adı ve Soyadı: *Head of Training's Name and Surname:* Aaaaaaaa BBBBB TRE-TR.FCL.H.xxxxxx	**Eğitim Müdürünün İmzası ve Mühür:** *Signature and Seal of HT:*

TOF-14 / REV-1 / 23.04.2024
(Re-designed via SHGM-FR.191)

APP-7 TRAINING PROGRAM, THEORETICAL KNOWLEDGE AND FLIGHT/SIMULATOR – WEEKLY PROGRAMS

A119	INITIAL TYPE RATING								ADDITIONAL TYPE RATING							
	WITH HELICOPTER								WITH HELICOPTER							
	TRAINING CODE	WEEK	DAY	HOUR					TRAINING CODE	WEEK	DAY	HOUR				
THEROTICAL KNOWLEDGE TRAINING	TKT-1..6	1	1	06:00					Same as “Initial Type Rating with Helicopter” TKT Program Applied							
	TKT-7..12		2	06:00												
	TKT-13..18		3	06:00												
	TKT-19..24		4	06:00												
	TKT-25..29		5	04:30												
	TKT-TOT			**28:30**												
	EXAM		5	01:30												
	TOTAL			**30:00**												
FLIGHT TRAINING	FT-1 VFR	2	6	01:00					FT-1 VFR	2	6	01:00				
	FT-2 VFR			01:00					FT-2 VFR			01:00				
	FT-3 VFR		7	01:00					FT-3 VFR		7	01:00				
	FT-4 VFR			01:00												
	FT-5 VFR		8	01:00												
	TOT-VFR			**05:00**								**03:00**				
	SKILL TEST		8	01:00							7	01:00				
	TOTAL			**06:00**								**04:00**				

AW109 (E / S)	INITIAL TYPE RATING								ADDITIONAL TYPE RATING							
	WITH HELICOPTER				WITH HELICOPTER+SIM				WITH HELICOPTER				WITH HELICOPTER+SIM			
	TRAINING CODE	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR
THEROTICAL KNOWLEDGE TRAINING	TKT-1..6	**1**	1	06:00	"Same as "Initial Type Rating with Helicopter" TKT Program Applied				Same as "Initial Type Rating with Helicopter" TKT Program Applied				Same as "Initial Type Rating with Helicopter" TKT Program Applied			
	TKT-7..12		2	06:00												
	TKT-13..18		3	06:00												
	TKT-19..24		4	06:00												
	TKT-25..30		5	04:42												
	TKT-TOT			**28:42**												
	EXAM		5	01:18												
	TOTAL			**30:00**												
FLIGHT TRAINING	FT-1 VFR		6	01:20	FT-1 VFR		6	02:00	FT-1 VFR		6	01:00	FT-1 VFR		6	02:00
	FT-2 VFR			01:20	FT-2 VFR			02:00	FT-2 VFR			01:00	FT-2 VFR			02:00
	FT-3 VFR		7	01:20	FT-3 VFR		7	02:00	FT-3 VFR		7	01:00				
	FT-4 VFR			01:20	FT-4 VFR			02:00	FT-4 VFR			01:00				
	FT-5 VFR		8	01:20												
	FT-6 VFR			01:20												
	TOT-VFR			**08:00**				**08:00**				**04:00**				**04:00**
	FT-7 IFR		9	01:15	FT-7 IFR		8	02:00	FT-7 IFR		8	01:00	FT-7 IFR		7	02:00
	FT-8 IFR			01:15	FT-8 IFR			02:00	FT-8 IFR		9	01:00	FT-8 IFR			02:00
	FT-9 IFR	**2**	10	01:15	FT-9 IFR	**2**	9	02:00	FT-9 IFR	**2**		01:00		**2**		
	FT-10 IFR			01:15	FT-10 IFR			02:00								
	TOT-IFR			**06:00**				**08:00**				**03:00**				**04:00**
	TOTAL			**14:00**				**16:00**				**07:00**				**08:00**
	SKILL TEST		11	01:30 (*)			10	01:30 (*)			10	01:30 (*)			8	01:30 (*)
					HLCP-VFR1			02:00					HLCP-VFR1		9	02:00
					HLCP-VFR2		11	02:00					HLCP-IFR1			02:00
					HLCP-IFR1			02:00								
	TOTAL			**15:30**				**23:30**				**08:30**				**13:30**

(*) ONLY VFR 01:00, ATPL 02:00 HOURS ARE APPLIED

AW109 (SP)	INITIAL TYPE RATING								ADDITIONAL TYPE RATING							
	WITH HELICOPTER				WITH HELICOPTER+SIM				WITH HELICOPTER				WITH HELICOPTER+SIM			
	TRAINING CODE	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR
THEROTICAL KNOWLEDGE TRAINING	TKT-1..6		1	06:00	"Same as "Initial Type Rating with Helicopter" TKT Program Applied				Same as "Initial Type Rating with Helicopter" TKT Program Applied				Same as "Initial Type Rating with Helicopter" TKT Program Applied			
	TKT-7..12		2	06:00												
	TKT-13..18	**1**	3	06:00												
	TKT-19..24		4	06:00												
	TKT-25..30		5	06:00												
	TKT-31..36		6	06:00												
	TKT-37..42		7	06:00												
	TKT-43..48		8	04:30												
		2														
	TKT-TOT			**46:30**												
	EXAM		8	01:30												
	TOTAL			**48:00**												
FLIGHT TRAINING	FT-1 VFR		9	01:20	FT-1 VFR		9	02:00	FT-1 VFR		9	01:00	FT-1 VFR		9	02:00
	FT-2 VFR			01:20	FT-2 VFR			02:00	FT-2 VFR			01:00	FT-2 VFR			02:00
	FT-3 VFR		10	01:20	FT-3 VFR		10	02:00	FT-3 VFR		10	01:00	FT-3 VFR		10	02:00
	FT-4 VFR			01:20	FT-4 VFR			02:00	FT-4 VFR			01:00				
	FT-5 VFR		11	01:20					FT-5 VFR		11	01:00				
	FT-6 VFR			01:20					FT-6 VFR			01:00				
	TOT-VFR			**08:00**				**08:00**				**06:00**				**06:00**
	FT-7 IFR		12	01:15	FT-7 IFR		11	02:00	FT-7 IFR		12	01:20	FT-7 IFR		11	02:00
	FT-8 IFR			01:15	FT-8 IFR			02:00	FT-8 IFR			01:20	FT-8 IFR			02:00
	FT-9 IFR	**3**	13	01:15	FT-9 IFR	**3**	12	02:00	FT-9 IFR	**3**	13	01:20		**3**		
	FT-10 IFR			01:15	FT-10 IFR			02:00								
	TOT-IFR			**06:00**				**08:00**				**04:00**				**04:00**
	TOTAL			**14:00**				**16:00**				**10:00**				**10:00**
	SKILL TEST		14	01:30 (*)			13	01:30 (*)			13	01:30 (*)			12	01:30 (*)
					HLCP-VFR1			02:00					HLCP-VFR1			02:00
					HLCP-VFR2		14	02:00					HLCP-VFR2		13	02:00
					HLCP-IFR1			02:00					HLCP-IFR1			02:00
	TOTAL			**15:30**				**23:30**				**11:30**				**17:30**

(*) ONLY VFR 01:00, ATPL 02:00 HOURS ARE APPLIED

AW139	INITIAL TYPE RATING								ADDITIONAL TYPE RATING							
	WITH HELICOPTER				WITH HELICOPTER+SIM				WITH HELICOPTER				WITH HELICOPTER+SIM			
	TRAINING CODE	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR	**TRAINING CODE**	**WEEK**	DAY	HOUR
THEROTICAL KNOWLEDGE TRAINING	TKT-1..6	**1**	1	06:00	“Same as “Initial Type Rating with Helicopter” TKT Program Applied				“Same as “Initial Type Rating with Helicopter” TKT Program Applied				“Same as “Initial Type Rating with Helicopter” TKT Program Applied			
	TKT-7..12		2	06:00												
	TKT-13..18		3	06:00												
	TKT-19..24		4	06:00												
	TKT-25..30		5	06:00												
	TKT-31..36	**2**	6	06:00												
	TKT-37..42		7	06:00												
	TKT-43..48		8	06:00												
	TKT-49..54		9	06:00												
	TKT-55..59		10	04:30												
	TKT-TOT			**58:30**												
	EXAM		10	01:30												
	TOTAL			**60:00**												
FLIGHT TRAINING	FT-1 VFR	**3**	11	01:20	FT-1 VFR	**3**	11	02:00	FT-1 VFR	**3**	11	01:00	FT-1 VFR	**3**	11	02:00
	FT-2 VFR			01:20	FT-2 VFR			02:00	FT-2 VFR			01:00	FT-2 VFR			02:00
	FT-3 VFR		12	01:20	FT-3 VFR		12	02:00	FT-3 VFR		12	01:00	FT-3 VFR		12	02:00
	FT-4 VFR			01:20	FT-4 VFR			02:00	FT-4 VFR			01:00	FT-4 VFR			02:00
	FT-5 VFR		13	01:20	FT-5 VFR		13	02:00	FT-5 VFR		13	01:00	-		-	-
	FT-6 VFR			01:20	FT-6 VFR			02:00	-			-	-		-	-
	TOTP-VFR			**08:00**				**12:00**				**05:00**				**08:00**
	FT-7 IFR		14	01:15	FT-7 IFR		14	02:00	FT-7 IFR		14	01:20	FT-7 IFR		13	02:00
	FT-8 IFR			01:15	FT-8 IFR			02:00	FT-8 IFR			01:20	FT-8 IFR			02:00
	FT-9 IFR		15	01:15	FT-9 IFR		15	02:00	FT-9 IFR		15	01:20	FT-9 IFR		14	02:00
	FT-10 IFR			01:15	FT-10 IFR			02:00	-		-	-	-		-	-
	TOT-IFR			**06:00**				**08:00**				**04:00**				**06:00**
	TOTAL			**14:00**				**20:00**				**09:00**				**14:00**
	SKILL TEST		16	01:30 (*)			16	01:30 (*)			15	01:30 (*)			14	01:30 (*)
					HLCP-VFR1	**4**	17	02:00					HLCP-VFR1		15	02:00
					HLCP-IFR1			02:00								
	TOTAL			**15:30**				**25:30**				**10:30**				**17:30**

(*) ONLY VFR 01:00, ATPL 02:00 HOURS ARE APPLIED

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APP-8 TRAINING PROGRAM, INITIAL & ADDITIONAL TYPE RATINGS THEORETICAL KNOWLEDGE - DAILY PROGRAMS

	HELICOPTER TYPE	A119		AW109 (E - S / SP)		AW139			
CODE	THEORETICAL KNOWLEDGE TRAINING TOPICS (AMC1 FCL.725.(a) II)	TRAINING CODE	HOUR MIN	TRAINING CODE	HOUR MIN	TRAINING CODE	HOUR MIN		
1 1.1	**Detailed listing for helicopters structure, transmissions, rotors and equipment, normal and abnormal operation of systems, Dimensions**	TKT-1/2	01.30	TKT-1/2/3	02.30	TKT-1/2/3	03.00		
1.7	Landing Gear, Skids Fixed and emergency Floats	TKT-2	00.30	TKT-3/4	01.00	TKT-4/5	01.00		
1.11	Cockpit, Cabin and Cargo Compartment	TKT-3	00.30	TKT-4/5	01.00	TKT-10	01.00		
1.2.1	Engine including Aux. Power Unit	TKT-3/4	01.00	TKT-5/6	01.30	TKT-6/7	02.00		
1.2.2	Main and Tail Rotor	TKT-4/5	01.00	TKT-7/8	01.30	TKT-8/9	02.00		
1.2.3	Transmission	TKT-5/6	01.00	TKT-8/9	01.30	TKT-10/11	02.00		
1.3	Fuel System	TKT-6/7	01.30	TKT-10/11/12	02.30	TKT-12/13/14	03.00		
1.9	Electrical Power Supply	TKT-8/9	01.30	TKT-12/13/14	02.30	TKT-15/16/17	03.00		
1.6	Hydraulic System	TKT-9/10	01.30	TKT-15/16/17	02.30	TKT-18/19/20	03.00		
1.4	Ventilation and Air Conditioning System	TKT-11	00.30	TKT-17/18	01.00	TKT-21	01.00		
1.8	Flight Controls, Stab- And Autopilot Systems	TKT-11/12	01.30	TKT-18/19/20	02.30	TKT-22/23/24	03.00		
1.5	Ice And Rain Protection, Windshield Wipers and Rain Repellent	TKT-13	00.30	TKT-21	01.00	TKT-25	01.00		
1.10	Flight Instruments, Communication, Radar and Navigation Equipment, Auto	TKT-13/14/15	02.30	TKT-22/23/24/25/26	05.00	TKT-26/27/28/29/30	05.00		

	Flight And Flight Data Recorders								
1.12	Emergency Equipment, Flight Crew Evacuation And Safety	**TKT-16**	**00.30**	**TKT-27**	**01.00**	**TKT-31**	**01.00**		
1.13	Fire	**TKT-16**	**00.30**	**TKT-28**	**01.00**	**TKT-32**	**01.00**		
1.14	Indication and Record System	**TKT-17**	**00.30**	**TKT-29**	**01.00**	**TKT-33**	**01.00**		
1.15	Lighting	**TKT-17**	**00.30**	**TKT-30**	**01.00**	**TKT-34**	**01.00**		
2 2.1	Limits (RFM)	**TKT-18/19**	**01.30**	**TKT-31/32/33**	**02.30**	**TKT-35/36/37**	**03.00**		
3.2	Flight Planning	**TKT-19/20**	**01.30**	**TKT-33/34/35**	**02.30**	**TKT-38/39/40**	**03.00**		
4.2	Servicing On the Ground, Servicing Connections	**TKT-21**	**00.30**	**TKT-36**	**01.00**	**TKT-41**	**01.00**		
4 4.1	Load, Balance and Servicing	**TKT-21/22**	**01.30**	**TKT-37/38/39**	**02.30**	**TKT-42/43/44**	**03.00**		
8	Optional equipment	**TKT-23/24**	**02.00**	**TKT-39/40/41/42**	**03.00**	**TKT-45/46/47/48**	**04.00**		
2.2	Minimum Equipment List (MEL)	**TKT-25**	**00.30**	**TKT-42/43**	**01.00**	**TKT-49**	**01.00**		
3 3.1	Performance, flight planning and monitoring	**TKT-25/26**	**01.30**	**TK-43/44/45**	**02.30**	**TKT-50/51/52**	**03.00**		
3.3	Effect Of Optional Equipment On Performance	**TKT-27**	**01.00**	**TKT-46/47**	**01.30**	**TKT-53/54**	**02.00**		
5	Emergency Procedures NOTE: It will be discussed in detail in the Flight Maneuvers section.	**TKT-28**	**01.00**	**TKT-47/48**	**01.30**	**TKT-55/56**	**02.00**		
6	Reserve	**-**	**-**	**-**	**-**	**-**	**--**		
7	Special Requirements for Helicopters with EFIS	**TKT-29**	**00.30**	**TKT-47/48**	**02.30**	**TKT-57/58/59**	**02.30**		
	TOTAL CLASS HOURS		**28.30**		Refer to		**58.30**		
	EXAM		**01.30**		Page 1-12 &		**01.30**		
	TOTAL		**30.00**		Page 1-13		**60.00**		
	HELICOPTER TYPE	**A119**		**AW109 (E - S / SP)**		**AW139**			

KAAN AIR

Multi Engine Helicopter INITIAL / ADDITIONAL Type Rating
Theoratical Knowledge Ground Training Plan

NAME AND SURNAME: LICENCE NO: TYPE: AW139

DAY	NO	SUBJECTS (AMC1 FCL.725.(a) II)	CODE	HR / MIN	DATE HR(L)	Student SURNAME & SIGN	Instructor SURNAME & SIGN
1	1	Deatiled listing for Helicopter structure, transmission, rotors and equipment, normal and abnormal operation of systems.	TKT-1/2	02:00	...../...../20.... __:__ / __:__		
	1.1	Dimensions	TKT-3	01:00	...../...../20.... __:__ / __:__		
	1.7	Landing gear, skid fixed, floats	TKT-4/5	01:00	...../...../20.... __:__ / __:__		
	1.11	Cockpit, cabin and cargo compartment	TKT-10	01:00	...../...../20.... __:__ / __:__		
	1.2.1	Engine including Aux. Power Unit	TKT-6/7	01:00	...../...../20.... __:__ / __:__		
2	1.2.1	Engine including Aux. Power Unit	TKT-6/7	01:00	...../...../20.... __:__ / __:__		
	1.2.2	Main and Tail Rotor	TKT-8/9	02:00	...../...../20.... __:__ / __:__		
	1.2.3	Transmission	TKT-10/11	02:00	...../...../20.... __:__ / __:__		
	1.3	Fuel system	TKT-12/13/14	01:00	...../...../20.... __:__ / __:__		
3	1.3	Fuel system	TKT-12/13/14	02:00	...../...../20.... __:__ / __:__		
	1.9	Electrical power supply	TKT-15/.16/17	03:00	...../...../20.... __:__ / __:__		
	1.6	Hydraulic system	TKT-18/19/20	01:00	...../...../20.... __:__ / __:__		
4	1.6	Hydraulic system	TKT-18/19/20	02:00	...../...../20.... __:__ / __:__		
	1.4	Ventilation and Air Conditioning System	TKT-21	01:00	...../...../20.... __:__ / __:__		
	1.8	Flight Controls, Stab- And Autopilot Systems	TKT-22/23/24	03:00	...../...../20.... __:__ / __:__		
5	1.5	Ice and rain protection, windshield wipers and rain repellent	TKT-25	01:00	...../...../20.... __:__ / __:__		
	1.10	Flight Instruments, Communication, Radar and Navigation Equipment, Auto Flight And Flight Data Recorders	TKT-26/27/28/29/30	05:00	...../...../20.... __:__ / __:__		

KAAN AIR

DAY	NO	SUBJECTS (According to AMC FCL 2.261 (a))	CODE	HR / MIN	DATE HR(L)	Student SURNAME & SIGN	Instructor SURNAME & SIGN
6	1.12	Emergency Equipment, Flight Crew Evacuation And Safety	TKT-31	01:00	…../…../20…. __:__ / __:__		
	1.13	Fire	TKT32	01:00	…../…../20…. __:__ / __:__		
	1.14	Indication and Record System	TKT-33	01:00	…../…../20…. __:__ / __:__		
	1.15	Lighting	TKT-34	01:00	…../…../20…. __:__ / __:__		
	2 2.1	Limits (RFM)	TKT-35/36/37	02:00	…../…../20…. __:__ / __:__		
7	2 2.1	Limits (RFM)	TKT-35/36/37	01:00	…../…../20…. __:__ / __:__		
	3.2	Flight Planning	TKT-38/39/40	03:00	…../…../20…. __:__ / __:__		
	4.2	Servicing On the Ground, Servicing Connections	TKT-41	01:00	…../…../20…. __:__ / __:__		
	4 4.1	Load, Balance and Servicing	TKT-42/43/44	01:00	…../…../20…. __:__ / __:__		
8	4 4.1	Load, Balance and Servicing	TKT-42/43/44	02:00	…../…../20…. __:__ / __:__		
	8	Optional Equipment	TKT-45/46/47/48	04:00	…../…../20…. __:__ / __:__		
9	2.2	Minimum Equipment List (MEL)	TKT-49	01:00	…../…../20…. __:__ / __:__		
	3 3.1	Performance, flight planning and monitoring	TKT-50/51/52	03:00	…../…../20…. __:__ / __:__		
	3.3	Effect of optional equipment on performance	TKT-53/54	02:00	…../…../20…. __:__ / __:__		
10	*5*	*Emergency Procedures* *NOTE: It will be discussed in detail in the Flight Maneuvers section.*	TKT-55/56	02:00	…../…../20…. __:__ / __:__		
	6	Special Requirements for Helicopters with EFIS	TKT-57/58/59	02:30	…../…../20…. __:__ / __:__		
	7	*Reserved*			…../…../20…. __:__ / __:__		
		TOTAL CLASS HOURS		58:30			
		EXAMINATION		01:30	…../…../20…. __:__ / __:__		
		TOTAL		60:00			

Seyit Emrah CANBAZGİL
TR-TRE(H)-10945
KAAN AIR ATO Head of Training

APP-9 INITIAL & ADDITIONAL TYPE RATINGS & DIFFERENCE & TRI & TRE THEORETICAL KNOWLEDGE FLIGHT TRAINING (FT) PROGRAM DETAILS (FLIGHT/SIMULATOR)

VFR FLIGHT MANEUVERS

1./2. Pre-Flight (Internal and External) checks
3. Engine Starting Procedures
4. Helicopter Ground Taxi
5. Vertical Take off, Landing and Air Taxi
6. Manoeuvre Helicopter in Ground Effect
7. CAT “B” Take-Off
8. CAT “A” Clear Area Take off
9. Rolling Take off
9b. Steep Take off
10. Straight and Level Flight
11. Speed Changes in Level Flight
12. Altitude Changes Climb and Descend
13. Standard, Medium and Steep Turns
14. External Load Operation (KA32 Only)
15. Flight at VNE
16. Quick Stop and Rapid Deceleration
17. OGE Hover, Vortex Ring State
18. Traffic Pattern
19. CAT B Approach
20 CAT A Clear Area Approach
21. Intentionally Blank
22. Rolling Landing
22b. Steep Approach
23. Air Taxi and Vertical Landing from Hover
24. Slope Operations
25. Use of Flight Management system (FMS)
26. Use of Flight Director
27. Shut Down, Securing the Aircraft
28. Intentionally Blank
29. Intentionally Blank
30. AP1 And AP2 Fail
31. Manual Control of Engine Power
32. DU Failure
33. Engine Fire in Flight
34. Engine Failure in Flight
35. Various Autorotations
36. Engine Failure during Take Off
37. Engine Failure During Approach
38. Smoke Elimination Procedures

IFR FLIGHT MANEUVERS

1. Instrument Take Off
2. Straight and Level Flight
3. Speed Changes in Level Flight
4. Altitude Changes – Climb and Descent
5. Turns
6. Climbing and Descending Turn

7. Descent in Autorotation and Power Recovery
8. Recovery from Unusual Attitude
9. Radio Navigation Patterns: NDB, VOR, GPS
10. Approach to Landing: NDB, VOR, ILS, GPS
11. Missed Approach Procedure/Go Around
12. Standard Instrument Departure (SID)
13. STAR

A119 FT DETAILS

FLIGHT TRAINING (HELICOPTER / +SIMULATOR) RECORD SAMPLE

CODE	VFR		TYPE OF FLIGHT (LEONARDO FLIGHT TRAINING STUDENT STUDY GUIDE)
FT-1 VFR	+		CL-1-2-3-4-5-6-7-10-11-12-19-20-27
FT-2 VFR	+		CL-1-2-3-7-9B-10-11-12-13-19-27-34-37-VARIOUS EMERG.
FT-3 VFR	+		CL-1-2-3-5-7--15-16-17-18-19-22B-23-24-27-35-36-38 VARIOUS EMERGENCY PROCEDURES
FT-4 VFR	+		CL-1-2-3-7-9B-19-27-30-31-32-33-34-35-36-37-38 VARIOUS EMERGENCY PROCEDURES
FT-5 VFR	+		CL-1-2-3-5-7-10-19-27-VARIOUS EMERGENCY PROCEDURES
CHECK/SKILL TEST	+		

CL : Checklist Procedures in the Page 5-42 / 43

AW109 E/S/SP FT DETAILS

FLIGHT TRAINING (HELICOPTER / +SIMULATOR) RECORD SAMPLE

CODE	VFR	IFR	TYPE OF FLIGHT (LEONARDO FLIGHT TRAINING STUDENT STUDY GUIDE)
FT-1 VFR	+		CL-1-2-3-4-5-6-7-8-10-11-12-19-20-27
FT-2 VFR	+		CL-1-2-3-7-8-9-9B-10-11-12-13-19-20-25-26-27-34-37-VARIOUS EMERG.
FT-3 VFR	+		CL-1-2-3-5-7-8-15-16-17-18-19-20-22-22B-23-24-27-35-36-38 VARIOUS EMERGENCY PROCEDURES
FT-4 VFR	+		CL-1-2-3-9-9B-25-26-27-30-31—32-33-34-35-36-37-38 VARIOUS EMERGENCY PROCEDURES
FT-5 VFR	+		CL-1-2-3-5-7-8-10-19-20-25-26-27-VARIOUS EMERGENCY PROCEDURES
FT-6 VFR	+		CL-1-2-3-5-7-8-10-19-20-25-26-27-VARIOUS EMERGENCY PROCEDURES
FT-7 IFR		+	1-2-3-4-5-6-7-8- VARIOUS EMERGENCY PROCEDURES

FT-8 IFR		+	9-10-11- VARIOUS EMERGENCY PROCEDURES
FT-9 IFR		+	9-10-11-12-13- VARIOUS EMERGENCY PROCEDURES
FT-10 IFR		+	9-10-11-12-13- VARIOUS EMERGENCY PROCEDURES
CHECK/SKILL TEST	+	+	
HLCP-VFR1	+		VFR: 1-2-3-4-5-6-7-8-10-11-12-13-18-19-20-23-25-26-27
HLCP-VFR2	+		VFR: 1-2-3-4-5-6-7-8-10-11-12-13-18-19-20-23-25-26-27
HLCP-IFR1		+	IFR: 1-2-3-4-5-6-7-9-10-11-12-13

CL : Checklist Procedures in the Page 5-42 / 43

<u>AW139 FT DETAILS</u>

FLIGHT TRAINING (HELICOPTER / +SIMULATOR) RECORD SAMPLE

CODE	VFR	IFR	TYPE OF FLIGHT (LEONARDO FLIGHT TRAINING STUDENT STUDY GUIDE)
FT-1 VFR	+		CL-1-2-3-4-5-6-7-8-10-11-12-19-20-27
FT-2 VFR	+		CL-1-2-3-7-8-9-9B-10-11-12-13-19-20-25-26-27-34-37-VARIOUS EMERG.
FT-3 VFR	+		CL-1-2-3-5-7-8-15-16-17-18-19-20-22-22B-23-24-27-35-36-38 VARIOUS EMERGENCY PROCEDURES
FT-4 VFR	+		CL-1-2-3-9-9B-25-26-27-30-31—32-33-34-35-36-37-38 VARIOUS EMERGENCY PROCEDURES
FT-5 VFR	+		CL-1-2-3-5-7-8-10-19-20-25-26-27-VARIOUS EMERGENCY PROCEDURES
FT-6 VFR	+		CL-1-2-3-5-7-8-10-19-20-25-26-27-VARIOUS EMERGENCY PROCEDURES
FT-7 IFR		+	1-2-3-4-5-6-7-8- VARIOUS EMERGENCY PROCEDURES
FT-8 IFR		+	9-10-11- VARIOUS EMERGENCY PROCEDURES
FT-9 IFR		+	9-10-11-12-13- VARIOUS EMERGENCY PROCEDURES
FT-10 IFR		+	9-10-11-12-13- VARIOUS EMERGENCY PROCEDURES
CHECK/SKILL TEST	+	+	
HLCP-VFR1	+		VFR: 1-2-3-4-5-6-7-8-10-11-12-13-18-19-20-23-25-26-27
HLCP-IFR1		+	IFR: 1-2-3-4-5-6-7-9-10-11-12-13

CL : Checklist Procedures in the Page 5-42 / 43

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FLIGHT TRAINING (HELICOPTER / +SIMULATOR) RECORD SAMPLE

CODE	Trainee / Instructor / Examiner	HLCP. TYPE / REGIST.	DATE	T/O TIME	LAND TIME	VFR	IFR		TOTAL	TYPE OF FLIGHT
FT-x						+				
						+				
						+				
						+				
						+				
						+				
							+			
							+			
							+			
							+			
CHECK						+	+			
FT-x (H)						+	+			HELICOPTER FLIGHT
				FLIGHT TRAINING TOTAL HOURS						
				CHECK FLIGHT						
				TOTAL HOURS						

* APP-1 TOF-1 The maneuvers in the Daily Flight Record form will be executed.

MULTI ENGINE HELICOPTER DIFFERENCE TRAINING THEORETICAL KNOWLEDGE TRAINING PLAN

WEEK	DAY	1.LESSON	REST	2.LESSON	REST	3.LESSON	LUNCH TIME	4.LESSON	REST	5.LESSON	REST	6.LESSON
1	1	TKT-1		TKT-2		TKT-3		TKT-4		TKT-5		TKT-6
	2	TKT-7		TKT-8		TKT-9		TKT-10		TKT-11		TKT-12
	3	TKT-13		REVIEW		EXAM						

MULTI ENGINE HELICOPTER DIFFERENCE TRAINING FLIGHT TRAINING PLAN

WEEK	DAY	08:30 09:30	09:30 10:15	10:30 12:00	LUNCH TIME	13:00 14:00	14:00 14:45	15:00 16:30	16:30 17:00
1									
	4	PFB	PFC	FT-1		PFB	PFC	*FT-2	PSB

** An additional 1-hour instrument flight training required for candidates wishing to extend their instrument rating (IR(H)).*

MULTI ENGINE HELICOPTER DIFFERENCE THEORETICAL KNOWLEDGE TRAINING PROGRAM

CODE NO	THEORETICAL KNOWLEDGE TRAINING (AMC1 FCL.725. (a) II)	TRAINING CODE/DATE	HOUR MIN	TRAINEE SIGN	INSTRUCTOR SIGN
1 1.1	Detailed listing for helicopters structure, transmissions, rotors and equipment, normal and abnormal operation of systems, Dimensions	TKT-1/2/3	**5**		
1.7	Landing Gear, Skids Fixed and emergency Floats		**10**		
1.11	Cockpit, Cabin and Cargo Compartment		**10**		
1.2	Engine, Rotor and Transmission System		**1 35**		
1.3	Fuel System		**30**		
1.9	Electrical Power Supply		**30**		
1.6	Hydraulic System	TKT-4/5/6	**1 00**		
1.8	Flight Controls, Stab- And Autopilot Systems		**1 00**		
1.4	Ventilation and Air Conditioning System		**20**		
1.5	Ice And Rain Protection, Windshield Wipers and Rain Repellent		**10**		
1.10	Flight Instruments, Communication, Radar and Navigation Equipment, Auto Flight And Flight Data Recorders		**25**		
1.12	Emergency Equipment, Flight Crew Evacuation And Safety		**5**		
3 3.1	Performance, flight planning and monitoring	TKT-7/8/9	**1 00**		
3.2	Flight Planning		**1 00**		
3.3	Effect of Optional Equipment on Performance		**15**		
4 4.1	Load, Balance and Servicing		**30**		
4.2	Servicing On the Ground, Servicing Connections		**5**		
8	Optional equipment		**10**		
2 2.1	Limits (RFM)	TKT-10/11/12/13	**1 00**		
2.2	Minimum Equipment List (MEL)		**30**		
5	Emergency Procedures NOTE: It will be discussed in detail in the Flight Maneuvers section.		**--**		
6	Reserve		**--**		
7	Special Requirements for Helicopters with EFIS		**2 30**		

	TOTAL CLASS HOURS	*Refer to*		
	EXAM	*Page*		
	TOTAL	*1-14*		

IR CONVERSION SET(H) IR → MET(H) THEORETICAL KNOWLEDGE TRAINING PROGRAM

WEEK	DAY	1. LESSON	REST	2. LESSON	REST	3. LESSON	LUNCH TIME	4. LESSON	REST	5. LESSON	REST	6. LESSON
1	1	TKTP-1/2		TKTP-2/3		TKTP-3/4		TKTP-4/5		TKTP-5/6/7		TKTP-7/8/9
	2	TKTP-9/10/11		TKTP-11/12/13		TKTP-13/14/15		TKTP-15/16/17				

IR CONVERSION MET(H) IR → MET(H) THEORETICAL KNOWLEDGE TRAINING PROGRAM

WEEK	DAY	1. LESSON	REST	2. LESSON	REST	3. LESSON	LUNCH TIME	4. LESSON	REST	5. LESSON	REST	6. LESSON
1	1	TKTP-1/23		TKTP-3/4/5		TKTP-5/6/7		TKTP-8/9/10/11/12		TKTP-13/14/15/16/17		

IR CONVERSION SET(H) IR → MET(H) FLIGHT PROGRAM

WEEK	DAY	08:30 09:30	09:30 10:15	10:30 12:00	LUNCH TIME	13:00 14:00	14:00 14:45	15:00 16:30	16:30 17:00
1									
	3	PFB	PFC	IR-1		PFB	PFC	IR-2	PSB
	4	PFB	PFC	IR-3		PFB	PFC	IR-4	PSB
	5	PFB	PFC	IR-5		PFB	PFC	CHECK	PSB

IR CONVERSION MET(H) IR → MET(H) FLIGHT PROGRAM

WEEK	DAY	08:30 09:30	09:30 10:15	10:30 12:00	LUNCH TIME	13:00 14:00	14:00 14:45	15:00 16:30	16:30 17:00
1									
	2	PFB	PFC	IR-1		PFB	PFC	IR-2	PSB
	3					PFB	PFC	CHECK	PSB

IR CONVERSION SEH/MEH IR → MEH/ IR THEORETICAL KNOWLEDGE TRAINING PROGRAM

TRAINING CODE	THEORETICAL KNOWLEDGE TOPICS (FCL.615.IR)	DATE	HOUR MIN	TRAINEE SIGN	INSTRUCTOR SIGN
TKTP-1	Performance Planning with RFM		**40**		
TKTP-2	Meteorological Restrictions of The Helicopter and The Use of Anti-Icing Systems		**40**		
TKTP-3	Preparation of IFR Flight Plan and IFR Communication Procedures		**80**		
TKTP-4	ILS Procedures		**40**		
TKTP-5	VOR and VGP Procedures		**40**		
TKTP-6	Use of MFD, PFD and MCDU		**30**		
TKTP-7	Use of Radio and Navigation Systems		**30**		
TKTP-8	Testing of Avionics Before Take-Off		**30**		
TKTP-9	AP and FD Checks Before Take-Off		**30**		
TKTP-10	IFR Procedures (Enroute and Approach)		**40**		
TKTP-11	IFR Approach Briefing		**30**		
TKTP-12	Procedures before FAF		**30**		
TKTP-13	Procedures after FAF		**20**		
TKTP-14	Before Landing Procedures		**40**		
TKTP-15	Approach Checks		**20**		
TKTP-16	Go Around Procedures		**20**		
TKTP-17	Emergency Procedures		**40**		
	TOTAL HOURS		10:00		

IR CONVERSION MEH IR → MEH/ IR THEORETICAL KNOWLEDGE TRAINING PROGRAM

TRAINING CODE	THEORETICAL KNOWLEDGE TOPICS (FCL.615.IR)	DATE	HOUR MIN	TRAINEE SIGN	INSTRUCTOR SIGN
TKTP-1	Performance Planning with RFM		**20**		
TKTP-2	Meteorological Restrictions of The Helicopter and The Use of Anti-Icing Systems		**20**		
TKTP-3	Preparation of IFR Flight Plan and IFR Communication Procedures		**40**		
TKTP-4	ILS Procedures		**20**		
TKTP-5	VOR and VGP Procedures		**20**		
TKTP-6	Use of MFD, PFD and MCDU		**15**		
TKTP-7	Use of Radio and Navigation Systems		**15**		
TKTP-8	Testing of Avionics Before Take-Off		**15**		
TKTP-9	AP and FD Checks Before Take-Off		**15**		
TKTP-10	IFR Procedures (Enroute and Approach)		**20**		
TKTP-11	IFR Approach Briefing		**15**		
TKTP-12	Procedures before FAF		**15**		
TKTP-13	Procedures after FAF		**15**		
TKTP-14	Before Landing Procedures		**15**		
TKTP-15	Approach Checks		**10**		
TKTP-16	Go Around Procedures		**10**		
TKTP-17	Emergency Procedures		**20**		
	TOTAL HOURS		05:00		

MULTI ENGINE DIFFERENCE TRAINING FLIGHT MANEUVERS

CODE	Trainee Instructor/ Examiner	HLCP. TYPE REGIST.	DATE	T/O TIME	LAND TIME	VFR	IFR		TOTAL	TYPE OF FLIGHT
FT-1						+			*Refer to*	VFR
FT-2/3/4							+		*Page*	IFR
									1-14	
				FLIGHT TRAINING TOTAL HOURS					*Refer to*	
				CHECK FLIGHT					*Page*	
				TOTAL HOURS					*1-14*	

* APP-1 TOF-1 The maneuvers in the Daily Flight Record form will be executed.

IR CONVERSION SEH/ IR → MEH/ IR FLIGHT MANEUVERS

CODE	Trainee Instructor/ Examiner	HLCP. TYPE REGIST.	DATE	T/O TIME	LAND TIME	VFR	IFR		TOTAL	TYPE OF FLIGHT
IR-1							01 00		01 00	IFR
IR-2							01 00		01 00	IFR
IR-3							01 00		01 00	IFR
IR-4							01 00		01 00	IFR
IR-5							01 00		01 00	IFR
CHECK							01 00		01:00	Check Flight
				FLIGHT TRAINING TOTAL HOURS					05 00	
				CHECK FLIGHT					01 00	
				TOTAL HOURS					06 00	

IR CONVERSION MEH/ IR → MEH/ IR FLIGHT MANEUVERS PROGRAM

CODE	TRAINEE INSTRUCTOR/ EXAMINER	HLCP. TYPE REGIST.	DATE	T/O TIME	LAND TIME	VFR	IFR		TOTAL	TYPE OF FLIGHT
IR-1							01 00		01 00	IFR
IR-2							01 00		01 00	IFR
CHECK							01 00		01:00	Check Flight
				FLIGHT TRAINING TOTAL HOURS					02 00	
				CHECK FLIGHT					01 00	
				TOTAL HOURS					03 00	

SINGLE/MULTI ENGINE HELICOPTER RATING RENEWAL THEORETICAL KNOWLEDGE, FLIGHT AND CHECK FLIGHT PROGRAM

WEEK	DAY	1.LESSON	2.LESSON	3.LESSON	LUNCH	4.LESSON	5.LESSON	6.LESSON
1	1	TKRT-1	TKRT-2	TKRT-3	REST	TKRT-4	TKRT-5	EXAM
	2	PFB	FRT	PSB	REST	PFB	CHECK	PSB

PFB : Pre-flight Briefing
PSB : Post-flight Briefing
TKRT: Theoretical Knowledge Renewal Training
FRT : Flight Renewal Training

SINGLE/MULTI ENGINE HELICOPTER RATING RENEWAL THEORETICAL KNOWLEDGE

(GROUND AND REFRESHER TRAINING)

CODE NO	THEORETICAL KNOWLEDGE TOPICS (AMC1 FCL.725.(a) ıı)	TRAINING CODE/DATE	HOUR MIN	TRAINEE SIGN	INSTRUCTOR SIGN
1 1.2 1.3 1.6 1.7	**OCT/REC (A) Aircraft Systems,** Helicopters structure, transmissions, rotors and equipment, normal and abnormal operation of systems Engine, Rotor and Transmission System Fuel System Hydraulic System Landing Gear, Skids Fixed and Emergency Floats	**TKRT-1**	**1 00**		
1.5 1.9 1.4 1.8 1.10 1.12 2 2.1 2.2	Ice And Rain Protection, Windshield Wipers and Rain Repellent Electrical Power Supply Ventilation and Air Conditioning System Flight Controls, Stab- And Autopilot Systems Flight Instruments, Communication, Radar and Navigation Equipment Emergency Equipment Limits (RFM) Minimum Equipment List (MEL)	**TKRT-2**	**01 00**		
3 3.1 3.2 3.3 4 4.1 4.2 5	**OCT/REC (B) Normal/ Operational Procedures and requirements;** flight planning and monitoring ground handling, de-icing/anti-icing, flight operations, Performance, Mass and Balance and Servicing, fuel schemes, selection of alternates, **OCT (C) Abnormal and Emergency Procedures; Pilot Incapacitation**	**TKRT-3**	**OCT 02 00** **/** **REC 01 00**		
GRO	Ground and Refresher Training **OCT (D), REC (C) Review of relevant samples of Accident/ incident and occurrences.**	**TKRT-4**	**01 00**		

OCT : Operator Conversion Training, *REC : Annual Recurrent Training*

CODE NO	THEORETICAL KNOWLEDGE TOPICS (ORO FC.230 (d), AMC 1 ORO.FC.230 (a)(2)	TRAINING CODE/DATE		HOUR MIN	TRAINEE SIGN	INSTRUCTOR SIGN
	Emergency and safety Equipment Training (ESET)	**Practical Training Date**	**Next Training Date**			
ESET	**Annual** (A) Procedures for wearing life jackets. (B) Use of oxygen cylinder. (C) Use of existing fire extinguishers (D) Training in the use of all emergency and safety equipment on board the aircraft. (E) Training on aircraft for all emergency exits. (F) Safety procedures	**TKRT-5**		**OCT 02 00 / REC 01 00**		
	3 Years (A) Actual use of emergency exits on aircraft. (B) Demonstration of "slide" use procedures when available. (C) Use of fire extinguisher cylinders of the same specification as those found on the aircraft on real or simulated fire (an alternative extinguisher may be used instead of Halon extinguishers) (D) Indoor smoke exposure and use of all related equipment in the simulated environment. (E) Training in real or simulated use of light/smoke marker munitions (where applicable); (F) Illustration of the use of floating boats. Demonstration of actual use of boats in the case of long-distance helicopter operations over the sea.					
	TOTAL CLASS HOURS		OCT REC	07 00 05 00		
	EXAM			01 00		
	TOTAL		OCT REC	08 00 06 00		

OCT : Operator Conversion Training, *REC : Annual Recurrent Training*

SINGLE/MULTI ENGINE HELICOPTER RATING RENEWAL FLIGHT TRAINING

CODE	Trainee	HLCP. TYPE	DATE	T/O	LAND	VFR	IFR		TOTAL	TYPE OF FLIGHT
	Instructor/ Examiner	REGIST.		TIME	TIME					
FRT 1						+	+ (Except A119)		02 00	Pre-Flight Preparation and Checks, Engine Starting, Hover, Taxi, Takeoff, Traffic Pattern, Approach Landing Normal and Abnormal operation of Systems and Procedures Emergency and Abnormal Procedures.
CHECK						01:00	VFR: -- CPL/IR: 00:30 ATPL: 01:00		VFR: 01:00 CPL/IR: 01:30 ATPL: 02:00	Check Flight
				FLIGHT TRAINING TOTAL HOURS					02:00	
				CHECK FLIGHT					VFR 01:00, CPL/IR: 01:30, ATPL: 02:00	
				TOTAL HOURS					VFR 03:00, CPL/IR: 03:30, ATPL: 04:00	

Not: *Proficiency Check may be counted instead of training flight times (FRT-1). (***FCL.625 FCL.740 FCL. 740.H***)*

Helicopter Type Rating Instructor Training / Teaching and Learning Course Lesson Plan

(FCL.940.TRI, AMC2 FCL.930.TRI Training Course)

CODE	TEACHING AND LEARNING LESSONS	SUBTOPICS	TIME	DATE / TOT	TRAINEE SIGN	INSTRUCTOR SIGN
TLT-1	1 LEARNING PROCESS	Introduction	00:15			
		Motivation	00:20			
		Perception and Understanding	00:15			
		Question and Evaluation	00:10			
TLT-2		Question and Feedback	00:05			
		Memory and Its Application	00:25			
		Habits and Transfer	00:25			
		Question and Evaluation	00:05			
TLT-3		Question and Feedback	00:05			
		Obstacles To Learning	00:25			
		Incentives To Learning	00:25			
		Question and Evaluation	00:05			
TLT-4		Question and Feedback	00:05			
		Learning Methods	00:25			
		Rates Of Learning	00:25			
		Question and Evaluation	00:05			
TLT-5	2 TEACHING PROCESS	Question and Feedback	00:05			
		Elements Of Effective Teaching	00:25			
		Planning Of Instructional Activity	00:25			
		Question and Evaluation	00:05			
TLT-6		Question and Feedback	00:05			
		Teaching Methods, Teaching From The 'Known' To The 'Unknown	00:25			
		Use Of 'Lesson Plans'	00:25			
		Question and Evaluation	00:05			

CODE	TEACHING AND LEARNING LESSONS	SUBTOPICS	TIME	DATE / TOT	TRAINEE SIGN	INSTRUCTOR SIGN
TLT-7	3 EDUCATIONAL PHILOSOPHY	Question and Feedback	00:05			
		Value Of A Structured (Approved) Course Of Training	00:20			
		Importance Of A Planned Syllabus	00:15			
		Integration Of Theoretical Knowledge and Flight Instruction	00:15			
		Question and Evaluation	00:05			
TLT-8	4 APPLIED TRAINING TECHNIQUES - (THEORETICAL KNOWLEDGE)	Question and Feedback	00:05			
		Theoretical Knowledge: Classroom Instruction Techniques	00:25			
		Use Of Training Aids	00:25			
		Question and Evaluation	00:05			
TLT-9		Question and Feedback	00:05			
		Group Lectures	00:20			
		Individual Briefings	00:15			
		Student Participation Or Discussion	00:15			
		Question and Evaluation	00:05			
TLT-10	4 APPLIED TRAINING TECHNIQUES - (FLIGHT TRAINING)	Question and Feedback	00:05			
		Flight: Airborne Instruction Techniques	00:25			
		The Flight Or Cockpit Environment;	00:25			
		Question And Evaluation	00:05			
TLT-11		Question And Feedback	00:05			
		Techniques Of Applied Instruction	00:25			
		Post-Flight and In-Flight Judgement and Decision Making	00:25			
		Question and Evaluation	00:05			

CODE	TEACHING AND LEARNING LESSONS	SUBTOPICS	TIME	DATE/ TOT	TRAINEE SIGN	INSTRUCTOR SIGN
TLT-12	5 STUDENT QUANTIFICATION AND CONSIDERATION	Question and Feedback	00:05			
		Assessment Of Student Performance	00:25			
		The Function Of Progress Tests	00:25			
		Question and Evaluation	00:05			
TLT-13		Question and Feedback	00:05			
		Recall Of Knowledge	00:25			
		Translation Of Knowledge Into Understanding	00:25			
		Question and Evaluation	00:05			
TLT-14		Question and Feedback	00:05			
		Development Of Understanding Into Actions	00:25			
		The Need To Evaluate Rate Of Progress	00:25			
		Question and Evaluation	00:05			
TLT-15		Question and Feedback	00:05			
		Analysis Of Student Errors	00:20			
		Establish The Reason For Errors	00:15			
		Tackle Major Faults First,	00:15			
		Question and Evaluation	00:05			
TLT-16		Question and Feedback	00:05			
		Minor Faults Second	00:20			
		Avoidance Of Over Criticism	00:15			
		The Need For Clear Concise Communication	00:15			
		Question and Evaluation	00:05			
TLT-17	6 DEVELOPMENT OF THE EDUCATIONAL PROGRAM	Question and Feedback	00:05			
		Lesson Planning	00:25			
		Preparation	00:25			
		Question and Evaluation	00:05			
TLT-18		Question and Feedback	00:05			
		Explanation and Demonstration	00:20			
		Student Participation and Practice	00:15			
		Evaluation	00:15			
		Question and Evaluation	00:05			

CODE	TEACHING AND LEARNING LESSONS	SUBTOPICS	TIME	DATE/ TOT	TRAINEE SIGN	SIGNATURE SIGN
TLT-19	7 FLIGHT TRAINING PHYSIOLOGICAL LIMITS	Question and Feedback	00:05			
		Psychological Factors	00:25			
		Psychological Factors	00:25			
		Question and Evaluation	00:05			
TLT-20		Question and Feedback	00:05			
		Human Information Processing	00:20			
		Behavioural Attitudes	00:15			
		Development Of Judgement And Decision Making	00:15			
		Question and Evaluation	00:05			
TLT-21	8 HAZARDS EXPOSED IN EMERGENCY TRAININGS	Question and Feedback	00:05			
		Specific Hazards Involved In Simulating Systems Failures And Malfunctions In The Aircraft During Flight	00:25			
		Importance Of ‘Touch Drills’	00:25			
		Question and Evaluation	00:05			
TLT-22		Question and Feedback	00:05			
		Situational Awareness	00:25			
		Adherence To Correct Procedures	00:25			
		Question and Evaluation	00:05			
TLT-23	9 TRAINING MANAGEMENT	Question and Feedback	00:05			
		Flight Or Theoretical Knowledge Instruction Records	00:25			
		Pilot’s Personal Flying Logbook	00:25			
		Question and Evaluation	00:05			
TLT-24		Question and Feedback	00:05			
		The Flight Or Ground Curriculum	00:20			
		Study Material	00:15			
		Official Forms	00:15			
		Question and Evaluation	00:05			

CODE	TEACHING AND LEARNING LESSONS	SUBTOPICS	TIME	DATE/ TOT	TRAINEE SIGN	INSTRUCTOR SIGN
TLT-25	9 TRAINING MANAGEMENT	Question and Feedback	00:05			
		Flight Manual Or Equivalent Document (For Example Owner's Manual Or Pilot's Operating Handbook);	00:20			
		Flight Authorisation Papers	00:15			
		Aircraft Documents The Private Pilot's License Regulations.	00:15			
		Question and Evaluation	00:05			
EXAM			02:00			

TLT : **Teaching and Learning Training**

Helicopter Type Rating Instructor Training / Teaching and Learning Course Lesson Plan

WEEK	DAY	1.LESSON 08:30 10:00	REST 30'	2.LESSON 10:30 12:00	LUNCH 60'	3.LESSON 13:00 14:15	REST 30'	4.LESSON 14:30 15:45	
1	1	TLT-1 TLT-2		TLT-2 TLT-3		TLT-4 TLT-10		TLT-5 TLT-6	
	2	TLT-6 TLT-7		TLT-8 TLT-9		TLT-9 TLT-10		TLT-10 TLT-11	
	3	TLT-12 TLT-13		TLT-13 TLT-14		TLT-15 TLT-16		TLT-16 TLT-17	
	4	TLT-17 TLT-18		TLT-19 TLT-20		TLT-20 TLT-21		TLT-21 TLT-22	
	5	TLT-23 TLT-24		TLT-24 TLT-25		EXAM (2 HOURS)			

Type Rating Instructor - Flight Training and Check / Technical Training Lesson Plan / INITIAL TYPE										
		08:30 09:30	09:30 10:00	10:00 12:00		1.LESSON 13:00 14:15	REST15'	2.LESSON 14:30 15:45	REST15'	16:00 16:30
2	6	PFB	PFC	FT-1		TT-1 TT-2		TT-2 TT-3		PSB
	7	PFB	PFC	FT-2		TT-3 TT-4		TT-4 TT-5		PSB
	8	PFB	PFC	FT-3		TT-6 TT-7		TT-7 TT-8		PSB
	9	PFB	PFC	FT-4		TT-8 TT-9		TT-9 TT-10		PSB
	10	PFB	PFC	FT-5 ***		EXAM				PSB
3	11	PFB	PFC	CHECK.		PSB				

Type Rating Instructor - Flight Training and Check / Technical Training Lesson Plan / ADDITIONAL TYPE										
		08:30 09:30	09:30 10:00	10:00 12:00		1.LESSON 13:00 14:15	REST15'	2.LESSON 14:30 15:45	REST15'	16:00 16:30
2	6	TT-1 TT-2	TT-2 TT-3	TT-3 TT-4		TT-4 TT-5		TT-6 TT-7		
	7	TT-7 TT-8	TT-8 TT-9	TT-9 TT-10		PFB PFC		FT-1		PSB
	8	PFB	PFC	UE-2		PFB PFC		CHECK		PSB

*** *If the instructor deems it appropriate, the Emergency topics in this sortie are shared with the first 4 sorties.*

Type Rating Instructor Technical Training Lesson Plan
(AMC2 FCL.930.TRI Part-2)

CODE	TECHNICAL(GROUND) TRAINING TOPICS	SOURCE	LESSON DURATION	DATE	TRAINEE SIGN	INSTRUCTOR SIGN
TT-1	Engine and External Power Supply Rotor and Transmission Systems	ROTORCRAFT FLIGHT MANUAL	01:00			
TT-2	Fuel System Hydraulic System Landing Gear Protection from Icing and Rain; Windshield Wipers; Ventilation and Air Conditioning Systems		01:00			
TT-3	Electrical System Flight Control Systems; Autopilot (AP)		01:00			
TT-4	Limits Minimum Equipment List		01:00			
TT-5	Performance Planning Flight Planning Weight And Balance		01:00			
TT-6	Ground Handling and Supply Procedures Emergency Procedures		01:00			
TT-7	Emergency Procedures		01:00			
TT-8	Emergency Procedures		01:00			
TT-9	Emergency Procedures		01:00			
TT-10	Display Systems		01:00			
	EXAM		01:00			
	TOTAL		**11:00**			

TT : Technical Training

Type Rating Instructor - Flight Training and Check / INITIAL – ADDITIONAL TYPE
(AMC2 FCL.930.TRI Part 3)

CODE	FLIGHT MANEUVERS
TRI1-FT-1	Pre-Flight Preparation and Checks Engine Starting Hover Maneuvers Taxi on the ground Hover Taxi Normal Take-off Aerodrome Circuit Approach to Hovering Vertical Take-Off Steep Approach to Hovering Take-off from Ground Approaching to the Ground Engine Shutdown
TRI1-FT-2	CAT-A Procedures Simulated Engine Failure on Take-Off / Landing before / after TDP/LDP Sudden Stop.
TRI1-FT-3	AP OFF Flight Emergency Procedures-1
TRI1-FT-4	Authoritative Descent and Its Characteristics 2D and 3D Approach Procedures (PBN, VGP,ILS etc.) Go Around Procedures
TRI1-FT-5***	MCC Emergency Procedures-2
CONT	ASSESSMENT OF COMPETENCE

**** If the instructor deems it appropriate, the emergency issues in this sortie are shared with the first 4 sorties.*

Type Rating Instructor - Flight Training and Check RECORD FORM (AMC2 FCL.930.TRI Part 3)

SINGLE / MULTI PILOT

CODE	FLIGHT MANEUVERS	FLIGHT TIME	DATE	TRAINEE SIGN	INSTRUCTOR SIGN
1	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
2	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
3	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
4	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
5	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
6	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
7	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
8	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
9	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
10	TRI1-FT-1, TRI1-FT-2, TRI1-FT-3, TRI1-FT-4, TRI1-FT-5				
CONT	ASSESSMENT OF COMPETENCE 1				
CONT	ASSESSMENT OF COMPETENCE 2				

Type Rating Instructor Renewal/Revalidate Assessment of Competence Flight Program

WEEK	DAY	1.LESSON	2.LESSON	3.LESSON	LUNCH	4.LESSON	5. LESSON	6. LESSON
1	1	PFB	CONT	PSB				

Type Rating Instructor Revalidate Assessment of Competence Flight Details

CODE	CONDITION	VFR	IFR (IF NEEDED)	TOTAL FLT.HRS.	FLIGHT DETAILS
ASSESSMENT OF COMPETENCE	WITH HLCP	01:00	01:00	01:00 VFR 02:00 VFR+IFR	FCL.920, AMC1 FCL.920 FCL.935 AMC2 FCL.930 Part 3 (k)
	WITH SIM	02:00	01:00	02:00 VFR 03:00 VFR+IFR	

Type Rating Instructor Renewal Training and Assessment of Competence Flight Details

CODE	CONDITION	FLIGHT HOURS (VFR/IFR) (AT LEAST)			FLIGHT DETAILS
TRAINING	WITH HLCP	01:00			FCL.920, AMC1 FCL.920 FCL.935 AMC2 FCL.930 Part 3 (k)
	WITH SIM	01:00			
ASSESSMENT OF COMPETENCE	WITH HLCP	01:00			FCL.920, AMC1 FCL.920 FCL.935 AMC2 FCL.930 Part 3 (k)
	WITH SIM	02:00			

Type Rating Instructor Revalidate / Renewal Training and Assessment of Competence Record Form

<table>
<tr><th rowspan="2">CODE</th><th rowspan="2">DATE</th><th>TRAINEE & SIGN</th><th>HLCP/SIM TYPE</th><th>T/O</th><th>LAND</th><th rowspan="2">VFR</th><th rowspan="2">IFR</th><th rowspan="2">TOTAL FLT.HRS.</th></tr>
<tr><th>INSTRUCTOR/ EXAMINER & SIGN</th><th>REGIST.</th><th>HOUR</th><th>HOUR</th></tr>
<tr><td rowspan="2">TRAINING</td><td rowspan="2"></td><td></td><td></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
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<tr><td rowspan="2">TRAINING</td><td rowspan="2"></td><td></td><td></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
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<tr><td rowspan="2">ASSESSMENT OF COMPETENCE</td><td rowspan="2"></td><td></td><td></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
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Instructor Refresher Seminar Plan

(AMC1 FCL.940.TRI (a)(1)(ii), (a)(2)(ii), (b)(2)(ii))

Number	TOPICS	Training Time	DATE	TRAINEE SIGN	INSTRUCTOR SIGN
1	Relevant Changes to National or EU regulations; SHT/Part-FCL	01:00			
2	Significant Changes in the Content of the Relevant Part of the Aviation System	01:00			
3	Legal Aspects and Enforcement Procedures	01:00			
4	The Role of the Instructor	01:00			
5	Teaching and Learning Styles	01:00			
6	- Instructional Techniques - Observational Skills	01:00			
7	Briefing and Debriefing Skills	01:00			
8	Developments in Competency-Based Instruction	01:00			
9	- Human Performance and Limitations - TEM (Thread and Error Management)	01:00			
10	Flight Safety, Prevention of Incidents and Accidents, including Those Specific to the ATO - Report Writing	01:00			
11	Any Additional Topics Proposed by TR DGCA / EASA - Instrument Flight Training	01:00			
12	- Meteorology	01:00			
TOTAL		**12:00**			

EXAMINER STANDARDIZATION THEORETICAL KNOWLEDGE TRAINING PROGRAM

WEEK	DAY	1. LESSON	REST	2. LESSON	REST	3. LESSON	LUNCH TIME	4. LESSON	REST	5. LESSON	REST	6. LESSON
1	1	EXST-1		EXST-2		EXST-3		EXST-4		EXST-5		EXST-6

EXAMINER STANDARDISATION THEORETICAL TRAINING FORM

TRAINING CODE	THEORETICAL TRAINING SHT-FCL, EASA FCL.1015,1020,1025,1030,1005	HOUR	DATE	CANDIDATE SIGNATURE	INSTRUCTOR SIGNATURE
EXST-1	STANDARDISATION ARRANGEMENTS FOR EXAMINERS LIMITATIONS	01:00			
	PURPOSE OF A TEST OR CHECK				
	CONDUCT OF TEST OR CHECK				
	EXAMINER PREPARATION				
	EXAMINER APPROACH				
	ASSESSMENT SYSTEM				
	METHOD AND CONTENTS OF THE TEST OR CHECK				
EXST-2	FCL,AMCs AND GMs TOPICS RELATED WITH EXAMINER STANDARDIZATION	01:00			
EXST-3	OPERATIONAL REQUIREMENTS AND RELEVANT AMCs AND GMs	01:00			
EXST-4	NATIONAL REQUIREMENTS FOR EXAMINER	01:00			
EXST-5	EVALUATION OF HUMAN PERFORMANCE AND LIMITS REGARDING FLIGHT CONTROLS	00:30			
EXST-6	PRINCIPLES OF EVALUATING CANDIDATE PERFORMANCE	00:30			
EXST-7	ATO MANAGEMENT SYSTEM	00:30			
EXST-8	PROTECTION OF PERSONAL INFORMATION, RESPONSIBILITIES, ACCIDENT INSURANCE AND PRICING	00:30			
TOTAL		06:00			

KAAN ATO HEAD OF TRAINING