**SUBPART J. INSTRUCTORS - IRI**

***AMC 1.* FCL. 930. IRI IRI — Training Course**

*GENERAL*

a ) The aim of the IRI Training Course is to train aircraft licence holders to the level of competence defined in FCL. 920, and adequate for an IRI ;

b ) The IRI Training Course should give particular stress to the role of the individual in relation to the importance of human factors in the man - machine environment ;

c ) Special attention should be paid to the applicant’s levels of maturity and judgment including an understanding of adults, their behavioral attitudes and variable levels of education ;

d ) With the exception of the section on “ teaching and learning ”, all the subject detail contained in the theoretical and flight training syllabus is complementary to the Instrument Rating pilot course syllabus which should already be known by the applicant.

Therefore, the objective of the course is to :

1 ) refresh and bring up to date the technical knowledge of the student - instructor ;

2 ) train pilots in accordance with the requirements of the modular instrument flying training course ;

3 ) enable the applicant to develop the necessary instructional techniques required for teaching of instrument flying, radio navigation and instrument procedures to the level required for the issue of an instrument rating ;

4 ) ensure that the student - instrument rating instructor’s flying is of a sufficiently high standard.

e ) In Part 3 some of the *Air Exercises* of the flight instruction syllabus of this AMC may be combined in the same flight ;

f ) During the training course the applicants should be made aware of their own attitudes to the important aspects of flight safety. Improving safety awareness should be a fundamental objective throughout the training course. It will be of major importance for the training course to aim at giving applicants the knowledge, skills and attitudes relevant to an instructor’s task. To achieve this, the course curriculum, in terms of objectives, should comprise at least the following areas ;

g ) It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight ;

h ) The student - instructor should learn how to identify common errors and how to correct them properly, which should be emphasized at all times.

*CONTENT*

( i ) The Training Course *consists of* ***3*** *( three ) Parts* :

1 ) **Part 1** : teaching and learning that should follow the content of AMC 1. FCL. 920 ;

2 ) **Part 2** : instrument technical theoretical knowledge instruction *( technical training )* ;

3 ) **Part 3** : flight instruction.

***Part 1.***

The content of the teaching and learning part of the FI Training Course, as established in AMC 1. FCL.930. FI, should be used as guidance to develop the course syllabus.

***Part 2.*** *THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS*

a ) The instrument theoretical knowledge instruction should comprise not less than 10 hours training to include the revision of instrument theoretical knowledge, the preparation of lesson plans and the development of classroom instructional skills to enable the IRI to instruct the instrument theoretical knowledge syllabus ;

b ) All the subject detail contained in the instrument theoretical knowledge instruction syllabus and flight instruction syllabus is complementary to the instrument rating pilot course syllabus which should already be known by the applicant. Therefore, the objective of the course is to :

1 ) refresh and bring up to date the technical knowledge of the student - instructor ;

2 ) train pilots in accordance with the requirements of the modular instrument flying training course ;

3 ) enable the applicant to develop the necessary instructional techniques required for teaching of instrument flying, radio navigation and instrument procedures to the level required for the issue of an instrument rating ; *and*

4 ) ensure that the student - instrument rating instructor’s flying is of a sufficiently high standard.

c ) The theoretical subjects covered below should be used to develop the instructor’s teaching skills. The items selected should relate to the student’s background and should be applied to training for an IR.

*GENERAL SUBJECTS*

d ) Physiological and psychological factors :

1 ) the senses ;

2 ) spatial disorientation ;

3 ) sensory illusions ;

4 ) stress.

e ) Flight Instruments :

1 ) air speed indicator ;

2 ) altimeter ;

3 ) vertical speed indicator ;

4 ) attitude indicator ;

5 ) heading indicator ;

6 ) turn and slip indicator ;

7 ) magnetic compass ;

8 ) in relation to the above instruments the following items should be covered :

( i ) principles of operation ;

( ii ) errors and in - flight serviceability checks ;

( iii ) system failures.

f ) Radio Navigation Aids :

1 ) basic radio principles ;

2 ) use of VHF RTF channels ;

3 ) the Morse code ;

4 ) basic principles of radio aids ;

5 ) use of VOR ;

6 ) ground and aeroplane equipment ;

7 ) use of NDB / ADF ;

8 ) ground and aeroplane equipment ;

9 ) use of VHF / DF ;

10 ) radio detection and ranging *( radar )* ;

11 ) ground equipment ;

12 ) primary radar ;

13 ) secondary surveillance radar ;

14 ) aeroplane equipment ;

15 ) transponders ;

16 ) precision approach system ;

17 ) other navigational systems *( as applicable )* in current operational use ;

18 ) ground and aeroplane equipment ;

19 ) use of DME ;

20 ) ground and aeroplane equipment ;

21 ) marker beacons ;

22 ) ground and aeroplane equipment ;

23 ) pre - flight serviceability checks ;

24 ) range, accuracy and limitations of equipment.

g ) Flight planning considerations ;

h ) Aeronautical Information Publications / AIP / :

1 ) the training course should cover the items listed below, but the applicant’s aptitude and previous aviation experience should be taken into account when determining the amount of instructional time allotted. Although a number of items contained under this heading are complementary to those contained in the PPL / CPL / IR syllabi, the instructor should ensure that they have been covered during the applicant’s training and due allowance should be made for the time needed to revise these items as necessary ;

2 ) AIP ;

3 ) NOTAM Class 1 and 2 ;

4 ) AIC ;

5 ) information of an operational nature ;

6 ) the Rules of the Air and ATS ;

7 ) Visual Flight Rules / VFR / and Instrument Flight Rules / IFR / ;

8 ) Flight Plans / FPL / and ATS messages ;

9 ) use of radar in ATS ;

10 ) radio failure ;

11 ) classification of airspace ;

12 ) airspace restrictions and hazards ;

13 ) holding and approach to land procedures ;

14 ) precision approaches and non - precision approaches ;

15 ) radar approach procedures ;

16 ) missed approach procedures ;

17 ) visual maneuvering after an instrument approach ;

18 ) conflict hazards in uncontrolled airspace ;

19 ) communications ;

20 ) types of services ;

21 ) extraction of AIP data relating to radio aids ;

22 ) charts available ;

23 ) en - route ;

24 ) departure and arrival ;

25 ) instrument approach and landing ;

26 ) amendments, corrections and revision service.

i ) flight planning general :

1 ) the objectives of flight planning ;

2 ) factors affecting aeroplane and engine performance ;

3 ) selection of alternate(s) ;

4 ) obtaining meteorological information ;

5 ) services available ;

6 ) meteorology briefing ;

7 ) telephone or electronic data processing ;

8 ) actual weather reports *( TAFs, METARs and SIGMET messages )* ;

9 ) the route forecast ;

10 ) the operational significance of the meteorological information obtained *( including icing, turbulence and visibility ) ;*

11 ) altimeter considerations ;

12 ) definitions of :

( i ) transition altitude ;

( ii ) transition level ;

( iii ) flight level ;

( iv ) QNH ;

( v ) regional QNH ;

( vi ) standard pressure setting ;

( vii ) QFE.

13 ) altimeter setting procedures ;

14 ) pre - flight altimeter checks ;

15 ) take - off and climb ;

16 ) en - route ;

17 ) approach and landing ;

18 ) missed approach ;

19 ) terrain clearance ;

20 ) selection of a minimum safe en-route altitude ;

21 ) IFR;

22 ) preparation of charts ;

23 ) choice of routes and flight levels ;

24 ) compilation of flight plan or log sheet ;

25 ) log sheet entries ;

26 ) navigation ground aids to be used ;

27 ) frequencies and identification ;

28 ) radials and bearings ;

29 ) tracks and fixes ;

30 ) safety altitude(s) ;

31 ) fuel calculations ;

32 ) ATC frequencies ( VHF ) ;

33 ) tower, approach, en - route, radar, FIS, ATIS, and weather reports ;

34 ) minimum sector altitudes at destination and alternate aerodromes ;

35 ) determination of minimum safe descent heights or altitudes *( Decision Heights )* at destination and alternate aerodromes.

j ) The privileges of the Instrument Rating :

1 ) outside controlled airspace ;

2 ) within controlled airspace ;

3 ) period of validity and renewal procedures.

***Part 3.*** *FLIGHT INSTRUCTION SYLLABUS*

a ) An approved IRI course should comprise of *at least* ***10*** *hours of flight instruction*, of which a maximum of 8 hours may be conducted in an FSTD. A similar number of hours should be used for the instruction and practice of pre - flight and post - flight briefing for each exercise ;

b ) The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently.

**A. AEROPLANES**

***LONG BRIEFINGS and AIR EXERCISES***

**EXERCISE 1 : *INTRUMENT FLYING*** *( Basic )*

*( for revision, as deemed necessary by the Instructor )*

***a )*** *Long Briefing objectives :*

1 ) flight instruments ;

2 ) physiological considerations ;

3 ) instrument appreciation :

( i ) attitude instrument flight ;

( ii ) pitch indications ;

( iii ) bank indications ;

( iv ) different instrument presentations ;

( v ) introduction to the use of the attitude indicator ;

( vi ) pitch attitude ;

( vii ) bank attitude ;

( viii ) maintenance of heading and balanced flight ;

( ix ) instrument limitations *( inclusive system failures ).*

4 ) attitude, power and performance :

( i ) attitude instrument flight ;

( ii ) control instruments ;

( iii ) performance instruments ;

( iv ) effect of changing power and configuration ;

( v ) cross - checking the instrument indications ;

( vi ) instrument interpretation ;

( vii ) direct and indirect indications *( performance instruments )* ;

( viii ) instrument lag ;

( ix ) selective radial scan.

5 ) the basic flight manoeuvres *( full panel )* :

( i ) straight and level flight at various air speeds and aeroplane configurations ;

( ii ) climbing ;

( iii ) descending ;

( iv ) standard rate turns ;

( v ) level, climbing and descending on to pre-selected headings.

***b )*** *Air Exercise :*

1 ) instrument flying *( basic )* ;

( i ) physiological sensations ;

( ii ) instrument appreciation ;

( iii ) attitude instrument flight ;

( iv ) pitch attitude ;

( v ) bank attitude ;

( vi ) maintenance of heading and balanced flight ;

( vii ) attitude instrument flight ;

( viii ) effect of changing power and configuration ;

( ix ) cross - checking the instruments ;

( x ) selective radial scan ;

2 ) the basic flight maneuvers *( full panel )* :

( i ) straight and level flight at various air speeds and aeroplane configurations ;

( ii ) climbing ;

( iii ) descending ;

( iv ) standard rate turns ;

( v ) level, climbing and descending on to pre-selected headings.

**EXERCISE 2 : *INTRUMENT FLYING*** *( Advanced )*

***a )*** *Long Briefing objectives :*

1 ) full panel ;

2 ) 30 ° level turns ;

3 ) unusual attitudes : recoveries ;

4 ) transference to instruments after take - off ;

5 ) limited panel ;

6 ) basic flight maneuvers ;

7 ) unusual attitudes : recoveries.

***b )*** *Air Exercise :*

1 ) full panel ;

2 ) 30 ° level turns ;

3 ) unusual attitudes : recoveries ;

4 ) limited panel ;

5 ) repeat of the above exercises.

**EXERCISE 3 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of VOR*

***a )*** *Long Briefing objectives :*

1 ) availability of VOR stations en-route ;

2 ) station frequencies and identification ;

3 ) signal reception range ;

4 ) effect of altitude ;

5 ) VOR radials ;

6 ) use of OBS ;

7 ) to or from indicator ;

8 ) orientation ;

9 ) selecting radials ;

10 ) intercepting a pre-selected radial ;

11 ) assessment of distance to interception ;

12 ) effects of wind ;

13 ) maintaining a radial ;

14 ) tracking to and from a VOR station ;

15 ) procedure turns ;

16 ) station passage ;

17 ) use of two stations for obtaining a fix ;

18 ) pre-selecting fixes along a track ;

19 ) assessment of ground speed and timing ;

20 ) holding procedures ;

21 ) various entries ;

22 ) communication *( R / T procedures and ATC liaison ).*

***b )*** *Air Exercise :*

1 ) station selection and identification ;

2 ) orientation ;

3 ) intercepting a pre-selected radial ;

4 ) R / T procedures and ATC liaison ;

5 ) maintaining a radial inbound ;

6 ) recognition of station passage ;

7 ) maintaining a radial outbound ;

8 ) procedure turn ;

9 ) use of two stations to obtain a fix along the track ;

10 ) assessment of ground speed and timing ;

11 ) holding procedures and entries ;

12 ) holding at a pre-selected fix ;

13 ) holding at a VOR station.

**EXERCISE 4 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of NDB*

***a )*** *Long Briefing objectives :*

1 ) availability of an NDB facilities en-route ;

2 ) location, frequencies, tuning *( as applicable )* and identification codes ;

3 ) signal reception range ;

4 ) static interference ;

5 ) night effect ;

6 ) station interference ;

7 ) mountain effect ;

8 ) coastal refraction ;

9 ) orientation in relation to an NDB ;

10 ) homing ;

11 ) intercepting a pre-selected magnetic bearing and tracking inbound ;

12 ) station passage ;

13 ) tracking outbound ;

14 ) time and distance checks ;

15 ) use of two NDBs to obtain a fix or alternatively use of one NDB and one other Navaid ;

16 ) holding procedures and various approved entries ;

17 ) communication *( R / T procedures and ATC liaison ).*

***b )*** *Air Exercise :*

1 ) selecting, tuning and identifying an NDB ;

2 ) ADF orientation ;

3 ) communication *( R / T procedures and ATC liaison )* ;

4 ) homing ;

5 ) tracking inbound ;

6 ) station passage ;

7 ) tracking outbound ;

8 ) time and distance checks ;

9 ) intercepting a pre-selected magnetic bearing ;

10 ) determining the aeroplane’s position from two NDBs or alternatively from one NDB and one other Navaid ;

11 ) ADF holding procedures and various approved entries.

**EXERCISE 5 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of VHF / DF*

***a )*** *Long Briefing objectives :*

1 ) availability of VHF / DF facilities en-route ;

2 ) location, frequencies, station call signs and hours of operation ;

3 ) signal and reception range ;

4 ) effect of altitude ;

5 ) communication *( R / T procedures and ATC liaison )* ;

6 ) obtaining and using types of bearings, for example QTE, QDM and QDR ;

7 ) homing to a station ;

8 ) effect of wind ;

9 ) use of two VHF / DF stations to obtain a fix *( or alternatively one VHF / DF station and one other Navaid ) ;*

10 ) assessment of groundspeed and timing.

***b )*** *Air Exercise :*

1 ) establishing contact with a VHF / DF station ;

2 ) R / T Procedures and ATC liaison ;

3 ) obtaining and using a QDR and QTE ;

4 ) homing to a station ;

5 ) effect of wind ;

6 ) use of two VHF / DF stations to obtain a fix *( or alternatively one VHF / DF station and one other Navaid ) ;*

7 ) assessment of groundspeed and timing.

**EXERCISE 6 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of DME*

***a )*** *Long Briefing objectives :*

1 ) availability of DME facilities ;

2 ) location, frequencies and identification codes ;

3 ) signal reception range ;

4 ) slant range ;

5 ) use of DME to obtain distance, groundspeed and timing ;

6 ) use of DME to obtain a fix.

***b )*** *Air Exercise :*

1 ) station selection and identification ;

2 ) use of equipment functions ;

3 ) distance ;

4 ) groundspeed ;

5 ) timing ;

6 ) DME arc approach ;

7 ) DME holding.

**EXERCISE 7 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of TRANSPONDERS ( SSR )*

***a )*** *Long Briefing objectives :*

1 ) operation of transponders ;

2 ) code selection procedure ;

3 ) emergency codes ;

4 ) precautions when using airborne equipment.

***b )*** *Air Exercise :*

1 ) operation of transponders ;

2 ) types of transponders ;

3 ) code selection procedure ;

4 ) emergency codes ;

5 ) precautions when selecting the required code.

**EXERCISE 8 : *RADIO NAVIGATION*** *( Applied Procedures ) :*

*Use of*  *EN - ROUTE RADAR*

***a )*** *Long Briefing objectives :*

1 ) availability of radar services ;

2 ) location, station frequencies, call signs and hours of operation ;

3 ) AIP and NOTAMs ;

4 ) provision of service ;

5 ) communication *( R / T, procedures and ATC liaison )* ;

6 ) airspace radar advisory service ;

7 ) emergency service ;

8 ) aircraft separation standards.

***b )*** *Air Exercise :*

1 ) communication *( R / T procedures and ATC liaison )* ;

2 ) establishing the service required and position reporting ;

3 ) method of reporting conflicting traffic ;

4 ) terrain clearance.

**EXERCISE 9 : *PRE - FLIGHT and AERODROME DEPARTURE and ARRIVAL PROCEDURES***

***a )*** *Long Briefing objectives :*

1 ) determining the serviceability of the aeroplane radio ;

2 ) navigation equipment ;

3 ) obtaining the departure clearance ;

4 ) setting up radio Navaids before take-off for example VOR frequencies, required radials, etc.. ;

5 ) aerodrome departure procedures, frequency changes ;

6 ) altitude and position reporting as required ;

7 ) SID procedures ;

8 ) obstacle clearance considerations.

***b )*** *Air Exercise :*

1 ) radio equipment serviceability checks ;

2 ) departure clearance ;

3 ) Navaid selection ;

4 ) frequencies, radials, etc.. ;

5 ) aerodrome departure checks, frequency changes, altitude and position reports ;

6 ) SID procedures.

**EXERCISE 10 : *INSTRUMENT APPORACH : ILS APPROACHES to SPECIFIED MINIMA***

***and MISSED APPROACH PROCEDURE***

***a )*** *Long Briefing objectives :*

1 ) precision approach charts ;

2 ) approach to the initial approach fix and minimum sector altitude ;

3 ) Navaid requirements, for example radar, ADF, etc,. ;

4 ) communication *( ATC liaison and R / T phraseology )* ;

5 ) holding procedure ;

6 ) the final approach track ;

7 ) forming a mental picture of the approach ;

8 ) completion of aerodrome approach checks ;

9 ) initial approach procedure ;

10 ) selection of the ILS frequency and identification ;

11 ) obstacle clearance altitude or height ;

12 ) operating minima ;

13 ) achieving the horizontal and vertical patterns ;

14 ) assessment of distance, groundspeed time, and rate of descent from the final approach fix to the aerodrome ;

15 ) use of DME *( as applicable )* ;

16 ) go-around and missed approach procedure ;

17 ) review of the published instructions ;

18 ) transition from instrument to visual flight *( sensory illusions )* ;

19 ) visual maneuvering after an instrument approach :

( i ) circling approach ;

( ii ) visual approach to landing.

***b )*** *Air Exercise :*

1 ) initial approach to the ILS ;

2 ) completion of approach planning ;

3 ) holding procedure ;

4 ) frequency selection and identification of ILS ;

5 ) review of the published procedure and minimum sector altitude ;

6 ) communication *( ATC liaison and R / T phraseology )* ;

7 ) determination of operating minima and altimeter setting ;

8 ) weather consideration, for example cloud base and visibility ;

9 ) availability of runway lighting ;

10 ) ILS entry methods ;

11 ) radar vectors ;

12 ) procedural method ;

13 ) assessment of approach time from the final approach fix to the aerodrome ;

14 ) determination of :

( i ) the descent rate on final approach ;

( ii ) the wind velocity at the surface and the length of the landing runway ;

( iii ) the obstruction heights to be borne in mind during visual maneuvering after an instrument approach ;

15 ) circling approach ;

16 ) the approach :

( i ) at the final approach fix ;

( ii ) use of DME ( as applicable ) ;

( iii ) ATC liaison ;

( iv ) note time and establish air speed and descent rate ;

( v ) maintaining the localizer and glide path ;

( vi ) anticipation in change of wind velocity and its effect on drift ;

( vii ) decision height ;

17 ) runway direction ;

18 ) overshoot and missed approach procedure ;

19 ) transition from instrument to visual flight ;

20 ) circling approach ;

21 ) visual approach to landing.

**EXERCISE 11 : *INSTRUMENTS APPROACH : NDB APPROACHES to SPECIFIED MINIMA***

***and MISSED APPROACH PROCEDURES***

***a )*** *Long Briefing objectives :*

1 ) non-precision approach charts ;

2 ) initial approach to the initial approach fix and minimum sector altitude ;

3 ) ATC liaison ;

4 ) communication *( ATC procedures and R / T phraseology )* ;

5 ) approach planning ;

6 ) holding procedure ;

7 ) the approach track ;

8 ) forming a mental picture of the approach ;

9 ) initial approach procedure ;

10 ) operating minima ;

11 ) completion of approach planning ;

12 ) achieving the horizontal and vertical patterns ;

13 ) assessment of distance, groundspeed time, and rate of descent from the final approach fix to the aerodrome ;

14 ) use of DME *( as applicable )* ;

15 ) go-around and missed approach procedure ;

16 ) review of the published instructions ;

17 ) transition from instrument to visual flight *( sensory illusions )* ;

18 ) visual maneuvering after an instrument approach ;

19 ) circling approach ;

20 ) visual approach to landing.

***b )*** *Air Exercise :*

1 ) completion of approach planning including determination of :

( i ) descent rate from the final approach fix ;

( ii ) the wind velocity at the surface and length of the landing runway ;

( iii ) the obstruction heights to be borne in mind during visual maneuvering after an instrument approach ;

2 ) circling approach ;

3 ) go-around and missed approach procedure ;

4 ) initial approach ;

5 ) frequency selection and identification ;

6 ) review of the published procedure and minimum safe sector altitude ;

7 ) ATC liaison and R / T phraseology ;

8 ) determination of decision height and altimeter setting ;

9 ) weather considerations, for example cloud base and visibility ;

10 ) availability of runway lighting ;

11 ) determination of inbound track ;

12 ) assessment of time from final approach fix to the missed approach point ;

13 ) the outbound procedure *( inclusive completion of pre-landing checks )* ;

14 ) the inbound procedure ;

15 ) re-check of identification code ;

16 ) altimeter setting re-checked ;

17 ) the final approach ;

18 ) note time and establish air speed and descent rate ;

19 ) maintaining the final approach track ;

20 ) anticipation of change in wind velocity and its effect on the drift ;

21 ) minimum descent altitude or height ;

22 ) runway direction ;

23 ) go-around and missed approach procedure ;

24 ) transition from instrument to visual flight *( sensory illusions )* ;

25 ) visual approach.

**EXERCISE 12 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of GNSS ( to be developed )*

***a )*** *Long Briefing objectives :* use of GNSS.

***b )*** *Air Exercise :* use of GNSS.

**B. HELICOPTERS**

***LONG BRIEFINGS and AIR EXERCISES***

**EXERCISE 1 : *INSTRUMENT FLYING*** *( Basic )*

*( for revision as deemed necessary by the instructor )*

***a )*** *Long Briefing objectives :*

1) flight instruments;

(2) physiological considerations;

(3) instrument appreciation:

(i) attitude instrument flight;

(ii) pitch indications;

(iii) bank indications;

(iv) different instrument presentations;

(v) introduction to the use of the attitude indicator;

(vi) pitch attitude;

(vii) bank attitude;

(viii) maintenance of heading and balanced flight;

(ix) instrument limitations (inc. system failures);

(4) attitude, power and performance:

(i) attitude instrument flight;

(ii) control instruments;

(iii) performance instruments;

(iv) effect of changing power;

(v) cross-checking the instrument indications;

(vi) instrument interpretation;

(vii) direct and indirect indications (performance instruments);

(viii) instrument lag;

(ix) selective radial scan;

(5) the basic flight maneuvers (full panel):

(i) straight and level flight at various air speeds;

(ii) climbing;

(iii) descending;

(iv) standard rate turns;

(v) level, climbing and descending on to pre-selected headings.

***b )*** *Air Exercise :*

(1) physiological sensations;

(2) instrument appreciation;

(3) attitude instrument flight;

(4) pitch attitude;

(5) bank attitude;

(6) maintenance of heading and balanced flight;

(7) attitude instrument flight;

(8) effect of changing power;

(9) cross-checking the instruments;

(10) selective radial scan;

(11) the basic flight maneuvers (full panel):

(i) straight and level flight at various air speeds and helicopter configurations;

(ii) climbing;

(iii) descending;

(iv) standard rate turns;

(v) level, climbing and descending on to pre-selected headings;

(vi) maneuvering at minimum and maximum IMC speed.

**EXERCISE 2 : *INSTRUMENT FLYING*** *( Advanced )*

***a )*** *Long Briefing objectives :*

(1) full panel;

(2) 30° level turns;

(3) unusual attitudes: recoveries;

(4) transition to instruments after take-off;

(5) limited panel;

(6) basic flight maneuvers;

(7) unusual attitudes: recoveries.

***b )*** *Air Exercise :*

(1) full panel;

(2) 30° level turns;

(3) unusual attitudes: recoveries;

(4) identification and recovery from low pitch steep bank and high pitch steep bank attitudes (at low and high power settings);

(5) limited panel;

(6) repeat of the above exercises.

**EXERCISE 3 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of VOR*

***a )*** *Long Briefing objectives :*

(1) availability of VOR stations en-route;

(2) station frequencies and identification;

(3) signal reception range;

(4) effect of altitude;

(5) VOR radials;

(6) use of OBS;

(7) to and from indicator;

(8) orientation;

(9) selecting radials;

(10) intercepting a pre-selected radial;

(11) assessment of distance to interception;

(12) effects of wind;

(13) maintaining a radial;

(14) tracking to and from a VOR station;

(15) procedure turns;

(16) station passage;

(17) use of two stations for obtaining a fix;

(18) pre-selecting fixes along a track;

(19) assessment of ground speed and timing;

(20) holding procedures;

(21) various entries;

(22) communication (R/T procedures and ATC liaison).

***b )*** *Air Exercise :*

(1) station selection and identification;

(2) orientation;

(3) intercepting a pre-selected radial;

(4) R/T procedures and ATC liaison;

(5) maintaining a radial inbound;

(6) recognition of station passage;

(7) maintaining a radial outbound;

(8) procedure turns;

(9) use of two stations to obtain a fix along the track;

(10) assessment of ground speed and timing;

(11) holding procedures and entries;

(12) holding at a pre-selected fix;

(13) holding at a VOR station.

**EXERCISE 4 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of NDB*

***a )*** *Long Briefing objectives :*

(1) availability of NDB facilities en-route;

(2) location, frequencies, tuning (as applicable) and identification codes;

(3) signal reception range;

(4) static interference;

(5) night effect;

(6) station interference;

(7) mountain effect;

(8) coastal refraction;

(9) orientation in relation to an NDB;

(10) homing;

(11) intercepting a pre-selected magnetic bearing and tracking inbound;

(12) station passage;

(13) tracking outbound;

(14) time and distance checks;

(15) use of two NDBs to obtain a fix or alternatively use of one NDB and one other navaid;

(16) holding procedures;

(17) communication (R/T procedures and ATC liaison).

***b )*** *Air Exercise :*

(1) selecting, tuning and identifying an NDB;

(2) ADF orientation;

(3) communication (R/T procedures and ATC liaison);

(4) homing;

(5) tracking inbound;

(6) station passage;

(7) tracking outbound;

(8) time and distance checks;

(9) intercepting a pre-selected magnetic bearing;

(10) determining the helicopter’s position from two NDBs or alternatively from one NDB and one other navaid;

(11) ADF holding procedures.

**EXERCISE 5 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of VHF / DF*

***a )*** *Long Briefing objectives :*

(1) availability of VHF/DF facilities en-route;

(2) location, frequencies, station call signs and hours of operation;

(3) signal and reception range;

(4) effect of altitude;

(5) communication (R/T procedures and ATC liaison);

(6) obtaining and using types of bearings, for example QTE, QDM, QDR;

(7) homing to a station;

(8) effect of wind;

(9) use of two VHF/DF stations to obtain a fix (or alternatively one VHF/DF station and one other navaid);

(10) assessment of groundspeed and timing.

***b )*** *Air Exercise :*

(1) establishing contact with a VHF/DF station;

(2) R/T procedures and ATC liaison;

(3) obtaining and using a QDR and QTE;

(4) homing to a station;

(5) effect of wind;

(6) use of two VHF/DF stations to obtain a fix (or alternatively one VHF/DF station and one other navaid);

(7) assessment of groundspeed and timing.

**EXERCISE 6 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of DME*

***a )*** *Long Briefing objectives :*

(1) availability of DME facilities;

(2) location, frequencies and identification codes;

(3) signal reception range;

(4) slant range;

(5) use of DME to obtain distance, groundspeed and timing;

(6) use of DME to obtain a fix;

***b )*** *Air Exercise :*

(4) station selection and identification;

(2) use of equipment functions;

(3) distance;

(4) groundspeed;

(5) timing;

(6) DME arc approach;

(7) DME holding.

**EXERCISE 7 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of TRANSPONDERS*

***a )*** *Long Briefing objectives :*

(1) operation of transponders;

(2) code selection procedure;

(3) emergency codes;

(4) precautions when using airborne equipment.

***b )*** *Air Exercise :*

(1) operation of transponders;

(2) types of transponders;

(3) code selection procedure;

(4) emergency codes;

(5) precautions when selecting the required code.

**EXERCISE 8 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of EN - ROUTE*

*RADAR SERVICES*

***a )*** *Long Briefing objectives :*

(1) availability of radar services;

(2) location, station frequencies, call signs and hours of operation;

(3) AIP and NOTAMS;

(4) provision of service;

(5) communication (R/T procedures and ATC liaison);

(6) airspace radar advisory service;

(7) emergency service;

(8) aircraft separation standards.

***b )*** *Air Exercise :*

(1) communication (R/T procedures and ATC liaison);

(2) establishing the service required and position reporting;

(3) method of reporting conflicting traffic;

(4) terrain clearance.

**EXERCISE 9 : *PRE - FLIGHT and AERODROME DEPARTURE and ARRIVAL POOCEDURES***

***a )*** *Long Briefing objectives :*

(1) determining the serviceability of the radio equipment;

(2) navigation equipment;

(3) obtaining the departure clearance;

(4) setting up radio navaids before take-off for example VOR frequencies, required radials, etc.;

(5) aerodrome departure procedures, frequency changes;

(6) altitude and position reporting as required;

(7) SID procedures;

(8) obstacle clearance considerations.

***b )*** *Air Exercise :*

(1) radio equipment serviceability checks;

(2) departure clearance;

(3) navaid selection;

(4) frequencies, radials, etc.;

(5) aerodrome departure checks, frequency changes, altitude and position reports;

(6) SID procedures.

**EXERCISE 10 : *INSTRUMENT APPROACH : PRECISION APPROACH AID***

***to SPECIFIED MINIMA and MISSED APPROACH PROCEDURES***

***a )*** *Long Briefing objectives :*

(1) precision approach charts;

(2) approach to the initial approach fix and minimum sector altitude;

(3) navaid requirements, for example radar, ADF, etc.;

(4) communication (ATC liaison and R/T phraseology);

(5) holding procedure;

(6) the final approach track;

(7) forming a mental picture of the approach;

(8) completion of aerodrome approach checks;

(9) initial approach procedure;

(10) selection of the ILS frequency and identification;

(11) obstacle clearance altitude or height;

(12) operating minima;

(13) achieving the horizontal and vertical patterns;

(14) assessment of distance, groundspeed time, and rate of descent from the final approach fix to the aerodrome;

(15) use of DME (as applicable);

(16) go-around and missed approach procedure;

(17) review of the published instructions;

(18) transition from instrument to visual flight (sensory illusions);

(19) visual manoeuvring after an instrument approach;

(i) circling approach;

(ii) visual approach to landing.

***b )*** *Air Exercise :*

(1) initial approach to the ILS;

Page 464

(2) completion of approach planning;

(3) holding procedure;

(4) frequency selection and identification of ILS;

(5) review of the published procedure and minimum sector altitude;

(6) communication (ATC liaison and R/T phraseology);

(7) determination of operating minima and altimeter setting;

(8) weather consideration, for example cloud base and visibility;

(9) availability of landing site lighting;

(10) ILS entry methods;

(11) radar vectors;

(12) procedural method;

(13) assessment of approach time from the final approach fix to the aerodrome;

(14) determination of:

(i) the descent rate on final approach;

(ii) the wind velocity at the surface and the length of the landing site;

(iii) the obstruction heights to be borne in mind during visual manoeuvring after an instrument approach;

(15) circling approach;

(16) the approach:

(i) at the final approach fix ;

(ii) use of DME (as applicable);

(iii) ATC liaison;

(iv) note time and establish air speed and descent rate;

(v) maintaining the localizer and glide path;

(vi) anticipation in change of wind velocity and its effect on drift;

(vii) decision height.

(17) landing direction;

(18) go-around and missed approach procedure;

(19) transition from instrument to visual flight;

(20) circling approach;

(21) visual approach to landing.

**EXERCISE 11 : *INSTRUMENT APPROACH : NON - PRECISION APPROACH***

***to SPECIFIED MINIMA and MISSED APPROACH PROCEDURES***

***a )*** *Long Briefing objectives :*

(1) non-precision approach charts;

(2) initial approach to the initial approach fix and minimum sector altitude;

(3) ATC liaison;

(4) communication (ATC procedures and R/T phraseology);

(5) approach planning;

(6) holding procedure;

(7) the approach track;

(8) forming a mental picture of the approach;

(9) initial approach procedure;

(10) operating minima;

(11) completion of approach planning;

(12) achieving the horizontal and vertical patterns;

(13) assessment of distance, groundspeed time, and rate of descent from the final approach fix to the aerodrome;

(14) use of DME (as applicable);

(15) go-around and missed approach procedure;

(16) review of the published instructions;

(17) transition from instrument to visual flight (sensory illusions);

(18) visual manoeuvring after an instrument approach;

(19) circling approach;

(20) visual approach to landing.

***b )*** *Air Exercise :*

(1) completion of approach planning, including determination of:

(i) descent rate from the final approach fix;

(ii) the wind velocity at the surface and length of the landing site;

(iii) the obstruction heights to be borne in mind during visual maneuvering after an instrument approach.

(2) circling approach;

(3) go-around and missed approach procedure;

(4) initial approach;

(5) frequency selection and identification;

(6) review of the published procedure and minimum safe sector altitude;

(7) ATC liaison and R/T phraseology;

(8) determination of decision height and altimeter setting;

(9) weather considerations, for example cloud base and visibility;

(10) availability of landing site lighting;

(11) determination of inbound track;

(12) assessment of time from final approach fix to the missed approach point;

(13) ATC liaison;

(14) the outbound procedure (incl. completion of pre-landing checks);

(15) the inbound procedure;

(16) re-check of identification code;

(17) altimeter setting re-checked;

(18) the final approach;

(19) note time and establish air speed and descent rate;

(20) maintaining the final approach track;

(21) anticipation of change in wind velocity and its effect on the drift;

(22) minimum descent altitude or height;

(23) landing site direction;

(24) go-around and missed approach procedure;

(25) transition from instrument to visual flight (sensory illusions);

(26) visual approach.

**EXERCISE 12 : *USE of GNSS*** *( to be developed )*

***a )*** *Long Briefing objectives :* use of GNSS.

***b )*** *Air Exercise :* use of GNSS.

**C. AIRSHIPS**

***LONG BRIEFINGS and AIR EXERCISES***

**EXERCISE 1 : *INSTRUMENT FLYING*** *( Basic )*

*( for revision as deemed necessary by the instructor )*

***a )*** *Long Briefing objectives :*

(1) flight instruments;

(2) physiological considerations;

(3) instrument appreciation:

(i) attitude instrument flight;

(ii) pitch indications;

(iii) different instrument presentations;

(iv) introduction to the use of the attitude indicator;

(v) pitch attitude;

(vi) maintenance of heading and balanced flight;

(vii) instrument limitations (inclusive system failures).

(4) attitude, power and performance :

(i) attitude instrument flight;

(ii) control instruments;

(iii) performance instruments;

(iv) effect of changing power, trim and configuration; (v) cross-checking the instrument indications;

(vi) instrument interpretation;

(vii) direct and indirect indications (performance instruments); (viii) instrument lag;

(ix) selective radial scan.

(5) the basic flight manoeuvres (full panel):

(i) straight and level flight at various air speeds and airship configurations;

(ii) climbing; (iii) descending;

(iv) standard rate turns;

(v) level, climbing and descending on to pre-selected headings.

***b )*** *Air Exercise :*

(1) physiological sensations;

(2) instrument appreciation;

(3) attitude instrument flight;

(4) pitch attitude;

(5) bank attitude;

(6) maintenance of heading and balanced flight;

(7) attitude instrument flight;

(8) effect of changing power and configuration;

(9) cross-checking the instruments;

(10) selective radial scan;

(11) the basic flight manoeuvres (full panel):

(i) straight and level flight at various air speeds and airship configurations;

(ii) climbing;

(iii) descending;

(iv) standard rate turns;

(v) level, climbing and descending on to pre-selected headings.

**EXERCISE 2 : *INSTRUMENT FLYING*** *( Advanced )*

***a )*** *Long Briefing objectives :*

(1) full panel;

(2) unusual attitudes: recoveries;

(3) transference to instruments after take-off;

(4) limited panel;

(5) basic flight maneuvers;

(6) unusual attitudes: recoveries.

***b )*** *Air Exercise :*

(1) full panel;

(2) unusual attitudes: recoveries;

(3) limited panel;

(4) repeat of the above exercises.

**EXERCISE 3 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of VOR*

***a )*** *Long Briefing objectives :*

(1) availability of VOR stations en-route;

(2) station frequencies and identification;

(3) signal reception range;

(4) effect of altitude;

(5) VOR radials;

(6) use of OBS;

(7) to or from indicator;

(8) orientation;

(9) selecting radials;

(10) intercepting a pre-selected radial;

(11) assessment of distance to interception;

(12) effects of wind;

(13) maintaining a radial;

(14) tracking to and from a VOR station;

(15) procedure turns;

(16) station passage;

(17) use of two stations for obtaining a fix;

(18) pre-selecting fixes along a track;

(19) assessment of ground speed and timing;

(20) holding procedures; (21) various entries;

(22) communication (R/T procedures and ATC liaison).

***b )*** *Air Exercise :*

(1) station selection and identification;

(2) orientation;

(3) intercepting a pre-selected radial;

(4) R/T procedures and ATC liaison;

(5) maintaining a radial inbound;

(6) recognition of station passage;

(7) maintaining a radial outbound;

(8) procedure turns;

(9) use of two stations to obtain a fix along the track;

(10) assessment of ground speed and timing;

(11) holding procedures and entries;

(12) holding at a pre-selected fix;

(13) holding at a VOR station.

**EXERCISE 4 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of ADF*

*( Automatic DF Equipment )*

***a )*** *Long Briefing objectives :*

(1) availability of NDB facilities en-route;

(2) location, frequencies, tuning (as applicable) and identification codes;

(3) signal reception range;

(4) static interference;

(5) night effect;

(6) station interference;

(7) mountain effect;

(8) coastal refraction;

(9) orientation in relation to an NDB;

(10) homing;

(11) intercepting a pre-selected magnetic bearing and tracking inbound;

(12) station passage;

(13) tracking outbound;

(14) time and distance checks;

(15) use of two NDBs to obtain a fix or alternatively use of one NDB and one other navaid;

(16) holding procedures and various approved entries;

(17) communication (R/T procedures and ATC liaison).

***b )*** *Air Exercise :*

(1) selecting, tuning and identifying an NDB;

(2) ADF orientation;

(3) communication (R/T procedures and ATC liaison);

(4) homing;

(5) tracking inbound;

(6) station passage;

(7) tracking outbound;

(8) time and distance checks;

(9) intercepting a pre-selected magnetic bearing;

(10) determining the airship’s position from two NDBs or alternatively from one NDB and one other navaid;

(11) ADF holding procedures and various approved entries.

**EXERCISE 5 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of* *VHF / DF*

***a )*** *Long Briefing objectives :*

(1) availability of VHF/DF facilities en-route;

(2) location, frequencies, station call signs and hours of operation;

(3) signal and reception range;

(4) effect of altitude;

(5) communication (R/T procedures and ATC liaison);

(6) obtaining and using types of bearings, for example QTE, QDM, QDR;

(7) homing to a station;

(8) effect of wind;

(9) use of two VHF/DF stations to obtain a fix (or alternatively one

VHF/DF station and one other Navaid);

(10) assessment of groundspeed and timing.

***b )*** *Air Exercise :*

(1) establishing contact with a VHF/DF station;

(2) R/T procedures and ATC liaison;

(3) obtaining and using a QDR and QTE;

(4) homing to a station;

(5) effect of wind;

(6) use of two VHF/DF stations to obtain a fix (or alternatively one VHF/DF station and one other navaid);

(7) assessment of groundspeed and timing.

**EXERCISE 6 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of* *DME*

***a )*** *Long Briefing objectives :*

(1) availability of DME facilities;

(2) location, frequencies and identification codes;

(3) signal reception range;

(4) slant range;

(5) use of DME to obtain distance, groundspeed and timing;

(6) use of DME to obtain a fix.

***b )*** *Air Exercise :*

(1) station selection and identification;

(2) use of equipment functions;

(3) distance;

(4) groundspeed;

(5) timing;

(6) DME arc approach;

(7) DME holding.

**EXERCISE 7 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of* *TRANSPONDERS*

***a )*** *Long Briefing objectives :*

(1) operation of transponders;

(2) code selection procedure;

(3) emergency codes;

(4) precautions when using airborne equipment.

***b )*** *Air Exercise :*

(1) operation of transponders;

(2) types of transponders;

(3) code selection procedure;

(4) emergency codes;

(5) precautions when selecting the required code.

**EXERCISE 8 : *RADIO NAVIGATION*** *( Applied Procedures ) : Use of* *EN - ROUTE RADAR*

*SERVICES*

***a )*** *Long Briefing objectives :*

(1) availability of radar services;

(2) location, station frequencies, call signs and hours of operation;

(3) AIP and NOTAMS;

(4) provision of service;

(5) communication (R/T, procedures and ATC liaison);

(6) airspace radar advisory service;

(7) emergency service;

(8) aircraft separation standards.

***b )*** *Air Exercise :*

(1) communication (R/T procedures and ATC liaison);

(2) establishing the service required and position reporting;

(3) method of reporting conflicting traffic;

(4) terrain clearance.

**EXERCISE 9 : *PRE - FLIGHT and AERODROME DEPARTURE and ARRIVAL PROCEDURES***

***a )*** *Long Briefing objectives :*

(1) determining the serviceability of the airship radio;

(2) navigation equipment;

(3) obtaining the departure clearance;

(4) setting up radio navaids before take-off for example VOR frequencies, required radials, etc.;

(5) aerodrome departure procedures, frequency changes;

(6) altitude and position reporting as required;

(7) SID procedures;

(8) obstacle clearance considerations.

***b )*** *Air Exercise :*

(1) radio equipment serviceability checks;

(2) departure clearance;

(3) navaid selection;

(4) frequencies, radials, etc.;

(5) aerodrome departure checks, frequency changes, altitude and position reports;

(6) SID procedures.

**EXERCISE 10 : *INSTRUMENT APPROACHES : ILS APPROACHES to***

***SPECIFIED MINIMA and MISSED APPROACHES PROCEDURES***

***a )*** *Long Briefing objectives :*

(1) precision approach charts;

(2) approach to the initial approach fix and minimum sector altitude;

(3) navaid requirements, for example radar, ADF, etc.;

(4) communication (ATC liaison and R/T phraseology);

(5) review;

(6) holding procedure;

(7) the final approach track;

(8) forming a mental picture of the approach;

(9) completion of aerodrome approach checks;

(10) initial approach procedure;

(11) selection of the ILS frequency and identification;

(12) obstacle clearance altitude or height;

(13) operating minima;

(14) achieving the horizontal and vertical patterns;

(15) assessment of distance, groundspeed time, and rate of descent from the final approach fix to the aerodrome;

(16) use of DME (as applicable);

(17) go-around and missed approach procedure;

(18) review of the published instructions;

(19) transition from instrument to visual flight (sensory illusions);

(20) visual manoeuvring after an instrument approach;

(i) circling approach;

(ii) visual approach to landing.

***b )*** *Air Exercise :*

(1) initial approach to the ILS;

(2) completion of approach planning;

(3) holding procedure;

(4) frequency selection and identification of ILS;

(5) review of the published procedure and minimum sector altitude;

(6) communication (ATC liaison and R/T phraseology);

(7) determination of operating minima and altimeter setting;

(8) weather consideration, for example cloud base and visibility;

(9) availability of runway lighting;

(10) ILS entry methods;

(11) radar vectors;

(12) procedural method;

(13) assessment of approach time from the final approach fix to the aerodrome;

(14) determination of:

(i) the descent rate on final approach;

(ii) the wind velocity at the surface (and the length of the landing runway);

(iii) the obstruction heights to be borne in mind during visual maneuvering after an instrument approach;

(15) circling approach;

(16) the approach:

(i) at the final approach fix;

(ii) use of DME (as applicable);

(iii) ATC liaison;

(iv) note time and establish air speed and descent rate;

(v) maintaining the localizer and glide path;

(vi) anticipation in change of wind velocity and its effect on drift;

(vii) decision height;

(viii) runway direction.

(17) missed approach procedure;

(18) transition from instrument to visual flight;

(19) circling approach;

(20) visual approach to landing.

**EXERCISE 11 : *INSTRUMENT APPROACHES : NDB APPROACHES to***

***SPECIFIED MINIMA and MISSED APPROACHES PROCEDURE***

***a )*** *Long Briefing objectives :*

(1) non-precision approach charts;

(2) initial approach to the initial approach fix and minimum sector altitude;

(3) ATC liaison;

(4) communication (ATC procedures and R/T phraseology);

(5) approach planning:

(i) holding procedure;

(ii) the approach track;

(iii) forming a mental picture of the approach;

(iv) initial approach procedure;

(v) operating minima;

(vi) completion of approach planning.

(6) achieving the horizontal and vertical patterns;

(7) assessment of distance, groundspeed time, and rate of descent from the final approach fix to the aerodrome;

(8) use of DME (as applicable);

(9) go-around and missed approach procedure;

(10) review of the published instructions;

(11) transition from instrument to visual flight (sensory illusions);

(12) visual maneuvering after an instrument approach;

(13) circling approach;

(14) visual approach to landing.

***b )*** *Air Exercise :*

(1) completion of approach planning including;

(2) determination of:

(i) descent rate from the final approach fix;

(ii) the wind velocity at the surface and length of the landing runway;

(iii) the obstruction heights to be borne in mind during visual maneuvering after an instrument approach.

(3) circling approach;

(4) go-around and missed approach procedure;

(5) initial approach;

(6) frequency selection and identification;

(7) review of the published procedure and minimum safe sector altitude;

(8) ATC liaison and R/T phraseology;

(9) determination of decision height and altimeter setting;

(10) weather considerations, for example cloud base and visibility;

(11) availability of runway lighting;

(12) determination of inbound track;

(13) assessment of time from final approach fix to the missed approach point;

(14) ATC liaison;

(15) the outbound procedure (inclusive completion of pre-landing checks);

(16) the inbound procedure;

(17) re-check of identification code;

(18) altimeter setting re-checked;

(19) the final approach;

(20) note time and descent rate;

(21) maintaining the final approach track;

(22) anticipation of change in wind velocity and its effect on the drift;

(23) minimum descent altitude or height;

(24) runway direction;

(25) go-around and missed approach procedure;

(26) transition from instrument to visual flight (sensory illusions);

(27) visual approach.

**EXERCISE 12 : *RADIO NAVIGATION ( Applied Procedures ) : Use of GNNS***

*( to be developed )*

***a )*** *Long Briefing objectives :* use of GNSS.

***b )*** *Air Exercise :* use of GNSS.