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# Area Control Surveillance Rating with Radar and Terminal Endorsements - Training Plans

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<b>Abstract</b>			
<p>This document enables the creation of an Air Traffic Controller (ATCO) initial training compliant with the European Air Traffic Management Programme (EATMP) common core content. It provides an example of a training programme of 456 periods corresponding to the en-route surveillance training with Radar and Terminal Area (TMA) endorsements. It includes a training area, simulation test and the training procedures.</p>			
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## DOCUMENT APPROVAL

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## EXECUTIVE SUMMARY

This document is the final report of the Drafting Group 7 (DG7) of the Task Force Common Core Content (TF-CCC) of the EATCHIP\EATMP<sup>1</sup> Human Resources Team (HRT) Training Sub-Group (TSG).

It presents the training plans corresponding to the 'Area Control Surveillance Rating with Radar Endorsement' (Module 7) and to the 'Terminal Area Control Endorsement' (Module 8). These training plans are an example of a training strategy to meet the training objectives stated in the document 'Guidelines for Common Core Content and Training Objectives for Air Traffic Controllers Training (Phase 2)' (EATMP, 2000a). This strategy produces a training whose duration is a total of 456 periods for Modules 7 and 8.

Chapter 1, 'Introduction', explains the background and the training documentation configuration.

Chapter 2, 'ATM Performance Objective for Module 7', details the performance expected from the student in simulation during and at the end of a training, the airspace on which the simulation is operated, the content and workload of final test simulation (see Annex A for the procedures).

Chapter 3, 'ATM Performance Objective for Module 8', details the performance expected from the student in simulation during and at the end of a training, the airspace on which the simulation is operated, the content and workload of final test simulation (see Annex B for the procedures).

Chapter 4, 'Training Plans for Module 7', is divided into two parts'. First part, 'Timescale', proposes an example of a training programme, with the number of training events per subject, classified according to the training methods to be used. Second part, 'Training Plans', states how each objective is taught to the student (lesson, part-task practice, simulation, etc.). Annex C details the workload of the test simulation. Annex D details the training event types.

Chapter 5, 'Training Plans for Module 8', is divided into two parts. First part, 'Timescale' proposes an example of a training programme, with the number of training events per subject, classified according to the training methods to be used. Second part, 'Training Plans', states how each objective is taught to the student (lesson, part-task practice, simulation, etc.). Annex C details the workload of the test simulation. Annex D details the training event types.

References, a Glossary of the terms used in these guidelines, a list of the Abbreviations and Acronyms used, and the names of the Contributors to this document are provided as Annexes.

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<sup>1</sup> The 'European Air Traffic Control Harmonisation and Integration Programme (EATCHIP)' has later become the 'European Air Traffic Management Programme (EATMP)'

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## 1. INTRODUCTION

### 1.1 Background

The main objective of the EATMP Human Resources Programme (HRS) Stage 1 is to further develop an Air Traffic Management (ATM) specific human resources / human factors toolbox (concepts, methods, tools) which will enable an adequate number of qualified staff to provide a harmonised and consistent quality of service delivery, ensure the best use of new technology and provide for a smooth transition towards the evolving European ATM systems.

The HRS Programme Phase 1 includes the Training Sub-Programme (TSP), defined as follows:

*To provide ANS Providers for all ATM areas training material, methods and tools to enable a common minimum standard of training which will evolve to meet the future introduction of system changes and will enable the implementation of regulatory requirements for ATM services personnel licensing.*

### 1.2 Task Force Common Core Content

Under the auspices of the EATCHIP Programme and later the EATMP Programme, the Human Resources Team (HRT) delegated responsibility for the Air Traffic Services (ATS) training to its Training Sub-Group (TSG), which created the Task Force Common Core Content (TF-CCC) in March 1995.

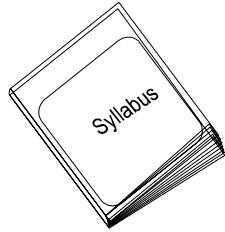
The training addressed by the TF-CCC was divided into phases, namely:

- Phase I deals with **basic** controller training and aims to impart fundamental knowledge and skills to enable student Air Traffic Controllers (ATCOs) to progress to specialised/rating training (see EATMP, 2001).
- Phase II provides for knowledge and skills during **rating** training to enable student ATCOs to commence On-the-Job Training (OJT) leading to the issue of an ATCO Licence (see EATMP, 2000a).

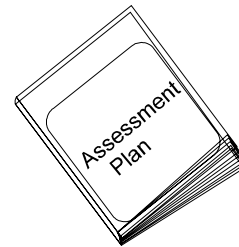
### 1.3 Structure of the EATMP Training Documentation

The structure of the training documentation was defined in the document 'Specifications on Training Methods and Tools' (EATMP, 2000b) as follows:

**(i) Syllabus**



**(ii) Training + Assessment Plan**



**(iii) Training Event Plans**



#### 1.3.1 Syllabus

A syllabus is a list of training objectives classified by subjects, topics and sub-topics showing the training necessary to fill the training gap and achieve the course aim. An unstructured content helps to detail the objectives. Syllabus does not indicate times, training techniques nor order to achieve the training objective.

### 1.3.2 Training Plan

A training plan is a syllabus with additional information. The training plan details for each subject or topic and for each objective the training requirements (type of training event, educational material needed, method and mode of delivery). It also mentions the timescale for achievement and states performance objectives or test to increase the accuracy of the specifications.

### 1.3.3 Training Event Plan

A training event is a set of actions identified in the training plan as the smaller unit of training. The training event has a type but is more accurately described by the association of a training technique, a media, a learning rate and a mode of delivery.

The Training Event Plan is the document to be used by the instructor when preparing and when providing the training. It recalls the objectives of the training event and its type. It gives a timeline and indicates material references and hints for the performance.

## 1.4 Purpose of this Document

The syllabus for ATCO initial training Phases 1 and 2 specify the objectives of the corresponding initial training. This specification does not include performance objectives or timescale.

The guidance on implementation of the 'European Manual of Personnel Licensing - Air Traffic Controllers' (EATMP, 2000c) states that *the designated authority should require training institutions to demonstrate how their courses meet the ECAC<sup>2</sup> guidelines on Common Core Content or, if they cannot, their plans to amend their training to meet the requirements*. The EUROCONTROL Safety Regulatory Requirement 5 (ESARR5) (SRC, 2000) lists the TF-CCC documents as a 'means of compliance' with the Regulatory Requirements. The purpose of this document is to define the training modules more accurately than the syllabus in order to allow training institutes to develop initial training according to these ECAC guidelines.

The expected benefits are:

- reduction of time and effort to develop training,
- possible reuse of off-the-shelf training materials,
- guidance for the demonstration of the compliance to the guidelines.

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<sup>2</sup> European Civil Aviation Conference

To achieve this and according to the training plan definition, this document includes:

- the performance objective in the ATM subject,
- the timescale,
- the training requirements.

## **2. ATM PERFORMANCE OBJECTIVE FOR MODULE 7**

### **2.1 Objective**

The general objective stated in the syllabus is: *students shall apply operational procedures to ensure a safe, orderly and expeditious service.*

The corresponding performance is:

In a radar simulator students shall:

- demonstrate the ability to manage the specified workload demand upon airspace area;
- apply operational radar and planning control techniques and procedures to ensure a safe, orderly and expeditious service.

### **2.2 Duties of the Students when Acting as Planner and Executive Controllers**

#### Duties Common to both the Executive Controller and the Planner Controller

- Adjust the relevant displays so that control functions can be performed properly and notify the instructor of any technical failure.
- Analyse, plan and control the flow of traffic by use of system and radar derived information.
- Detect potential conflicts between aircraft by use of system and radar derived information.
- Provide and maintain the prescribed separation between aircraft and between aircraft and airspace boundaries.
- Manage several coinciding tasks while maintaining situational awareness.
- Monitor flight data displays and ensure that they are maintained up-to-date.
- Prioritise tasks and delegate when appropriate.
- Communicate in a clear and precise manner using standard phraseology when available.
- Ensure that all co-ordinations are carried out in accordance with prescribed procedures.
- Manage complete or partial communications failures.

- Assist and give priority to aircraft in unusual/emergency situations and take all actions necessary to ensure aircraft safety.

#### Specific duties for the Executive Controller

- Maintain a continuous listening watch on the sector frequencies and carry out all Radiotelephone (RTF) communication.
- Take the necessary control actions within the sector's area of responsibility to comply with the plan established by the Planner Controller.
- Liaise with the Planner Controller when planned exit levels cannot be achieved.
- Ensure that the Planner Controller is warned that the traffic situation is developing to the extent that the sector could be overloaded.
- Ensure that the Planner Controller is informed of any potential or actual unusual/emergency situations or unusual occurrence taking place within the sector's area of responsibility.

#### Specific duties of the Planner Controller

- Plan and accept aircraft safely into the sector in accordance with prescribed procedures.
- Plan exit conditions according to the Planning Standards or as agreed with the accepting unit/sector.
- Co-ordinate with adjacent units/sectors joining and crossing clearances, estimates, revisions, approval requests and expedite clearances in accordance with prescribed procedures.
- Ensure that co-ordination is effected prior to transferring aircraft.
- Co-ordinate with the Executive Controller the acceptance of any aircraft entering the sector's area of responsibility not complying with navigation or communication requirement (e.g. unserviceable transponder).
- Transfer received radar identity of an aircraft to the Executive Controller.
- Ensure the Executive Controller is aware of any co-ordinated climb or descent made with an adjacent unit/sector.
- Inform Watch Supervisor of unusual/emergency situations within the sector's area of responsibility.

## 2.3 Airspace

The features of a locally used training sector should enable the generation of the type of traffic situation and the type of tasks similar to the ones in Table 1.

Table 1: Airspace


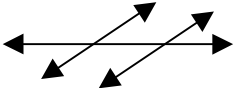
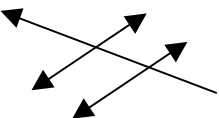
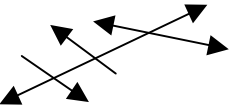
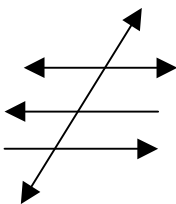
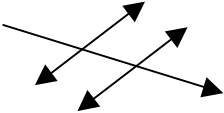

Vertical Limits	FL 245  unlimited
Dimensions	100 NM x 100 NM (approx.)
Route Structure	E-W  2 way with 2 crossing points
	SE-NW  1 way with 2 crossing points
	NE-SW  2 way with 3 crossing points
	SW-NE  2 way RNAV with 3 crossing points
	NW-SE  1 way with 2 crossing points
	 1 converging
Airspace Classification	A
Zones/Areas/Restricted	2 military exercise areas active on notification

Table 1: Airspace (continued)

Aerodromes	4 aerodromes in adjacent areas 2 aerodromes below the exercise area
Adjacent Areas	1 adjacent UAC, 2 sectors in same UAC, 1 Terminal Control (TCL) below

An example of a sector complying with these features is to be found in Annex A with all related procedures. The definition of the workload is based on the use of this sector. The sector and the procedures are available to any ECAC State wishing to use it as its local sector.

## 2.4 Performance

A typical simulation, possibly a test simulation located at the end of the module, describes the performance. The assessment procedure will include at least two separate simulations, one for planner, one for executive role. Teamwork should be an essential element in the overall assessment of student performance at all times.

### 2.4.1 Duration of the Typical Simulation

The simulations would be 45-50 min. duration including short briefing. Structured briefing and debriefing will be planned outside the simulations.

### 2.4.2 Traffic of the Typical Simulation

The actual number of aircraft should relate to the sector hourly capacity and a simulation workload figure of 75% of the theoretical capacity.

C is the maximum hourly capacity.  
T is the duration of the exercise.  
M is the exercise number of aircraft:

$$(C \times 75\%) \times \frac{T}{60} = M$$

For our sector hourly capacity is 60 aircraft per hour:

$$(60 \times 75\%) \times \frac{45}{60} = 34$$

This is 34 aircraft for 45 min. exercise period.



### 2.4.3 Workload

#### 2.4.3.1 General

34 flight plans activated during the exercise of which 11-12 aircraft will be in contact and assumed simultaneously.

5 to 7 will simultaneously generate action requirements.

2 simultaneous problems to be solved.

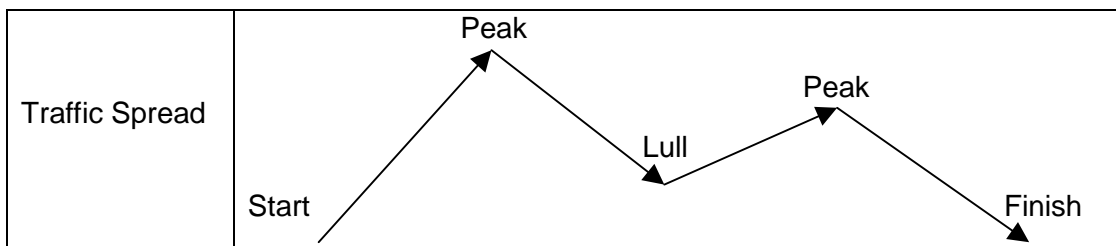


Figure 1: Workload

#### 2.4.3.2 Detailed

The detailed workload is described in [Annex C](#).

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### **3. ATM PERFORMANCE OBJECTIVE FOR MODULE 8**

#### **3.1 Objective**

The general objective stated in the syllabus is: *students shall apply operational procedures to ensure a safe, orderly and expeditious service.*

In a radar simulator students shall:

- demonstrate the ability to manage the specified workload demand within the specified Terminal Control (TCL) area of responsibility;
- apply operational radar and planning control techniques and procedures to ensure a safe, orderly and expeditious service to arriving, holding, departing and transiting aircraft.

#### **3.2 Duties of the Students when Acting as Planner and Executive Controllers in the Terminal Area Endorsement**

The duties are similar to the organisation described in Module 7. The wording of the objectives is very similar to the one of Module 7 but applied in a different airspace.

However, the following techniques and skills require enhancements:

##### Arrivals

- (i) Manage inbound aircraft transferred to the TCL from en-route. (Expect aircraft transferred to be in accordance with en-route to TCL agreements and at appropriate speeds).
- (ii) Manage inbound aircraft from the release point with en-route to the inner holding fixes. (Utilise Standard Arrival Routes [STARs]; apply appropriate radar separation and apply in-trail spacing [streaming] when required; apply speed control techniques).
- (iii) Manage inbound aircraft established in the inner holding area at the initial approach fix. (Anticipate the need to hold; use holding levels effectively; manage aircraft at holding speeds; liaise with APC and obtain the landing interval; obtain Expected Approach Times [EATs] when required and pass to aircraft and appropriate ATC Agencies).
- (iv) Manage aircraft leaving controlled airspace.
- (v) Manage inbound aircraft to an airfield without an APC unit.

### Departures

- (i) Manage outbound aircraft from Aerodrome Control (ADC/APC) to the point where aircraft are transferred to en-route. (Utilise radar to expedite departing aircraft, utilise published departure routes [Standard Instrument Departure - SID], apply appropriate speed control to departing aircraft, apply appropriate radar separation prior to transferring aircraft to en-route, manage Visual Flight Rules [VFR] traffic and special status/non-standard flights).
- (ii) Manage aircraft joining controller airspace.
- (iii) Manage departing aircraft from an airfield without an Approach Control (APP) unit.
- (iv) Issue departure releases.

### Flow management

- (i) Anticipate the need to hold back arrival aircraft in en-route airspace, stack switching (tactical Terminal Control [TCL] re-routing).
- (ii) Apply tactical flow management to departing aircraft when necessary.

### Terminal Control (TCL) module theory


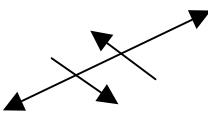

The objectives are detailed in the syllabus but a synthetic view of the enhancements from Modules 7 to 8 could be worded as follows:

- (i) Demonstrate knowledge of the effect of airfield weather on TCL operations (RVR, surface wind and wind in the radar circuit and Low Visibility Procedures [LVPs]).
- (ii) Demonstrate ability to disseminate and understand the effect of SIGMETs and Terminal Area Forecasts (TAFs) on TCL operations.
- (iii) Knowledge of aircraft navigation and communications equipment that must be carried within the Terminal Area.
- (iv) Demonstrate knowledge of environmental constraints on TCL operations, for example, restrictions on vectoring aircraft off Noise Preferential Routes (NPRs).
- (v) Demonstrate knowledge of aircraft performance characteristics at lower levels (rates of climb/descent, minimum/maximum speeds, rates of turn) including helicopters and military jet aircraft.

### 3.3 Airspace

The features of a locally used training sector should enable the generation of the type of traffic situation and the type of tasks similar to the ones in [Table 2](#).

**Table 2:** Airspace

Vertical Limits	$\frac{\text{FL 95} - \text{FL 245}}{1000 \text{ ft} - \text{FL 95}}$	
Dimensions	60 NM x 50 NM (approx.)	
Route Structure	SE-NW 	1 way with 1 crossing point
	NE-SW 	2 way with 2 crossing points
	NW-SE 	1 way with 1 crossing point
Airspace Classification	C + F	
Zones/Areas/Restricted	None	
LOAs	See <a href="#">Annex B</a>	
Aerodromes	2 aerodromes below the exercise area	
Operating Procedures	See <a href="#">Annex B</a>	
Adjacent Areas	1 UAC above, 2 sectors in same ACC, 2 sectors in adjacent ACC, an APP below, an information zone below	

An example of a TCL complying with these features is to be found in [Annex B](#) with all related procedures and Letter of Agreement (LOA). The definition of the workload based on the use of this TCL. The area and the procedures are available to any ECAC State wishing to use it as its local sector.

### 3.4 Performance

A typical simulation, possibly a test simulation located at the end of the module, describes the performance. This way to define final level does not mean recommendation of final test against continuous assessment.

#### 3.4.1 Duration of the Typical Simulation

The simulations would be 45–50 min. duration including short briefing. Structured briefing and debriefing will be planned outside the simulations.

#### 3.4.2 Traffic of the Typical Simulation

The actual numbers of aircraft should relate to the possible sector hourly capacity and a simulation workload figure of 75% of the theoretical capacity was agreed.

C is the maximum hourly capacity.

T is the duration of the exercise.

M is the exercise number of aircraft:

$$(C \times 75\%) \times \frac{T}{60} = M$$

For our TCL hourly capacity is 80 aircraft per hour:

$$(80 \pm 4 \times 75\%) \times \frac{45}{60} = 45 \pm 3$$

This is 45 aircraft for 45 min. exercise period.

#### 3.4.3 Workload

##### 3.4.3.1 General

45 flight plans activated during the exercise of which 11-12 aircraft will be in contact and assumed simultaneously, 40% arrivals, 40% departures and 20% transits.

##### 3.4.3.2 Detailed

The detailed workload is described according to the method included in Annex C.

## 4. TRAINING PLANS FOR MODULE 7

### 4.1 Timescale

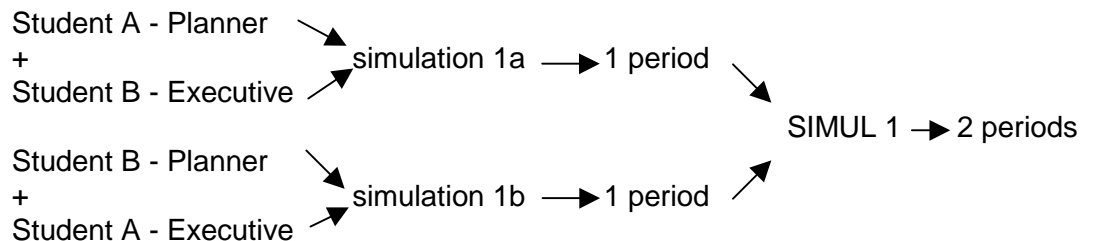
#### 4.1.1 Introduction

These training plans are an example of a possible training for an institute equipped with an adequate radar simulator.

The duration of training event is written in 'periods': to cope with various practices in different training institutes and according to the subject, the period is defined as lasting from 40 to 60 min.

Duration of additional training event dedicated to topics such as 'National Legislation and Procedures' are not specified because they will vary according to the location. Duration of other additional training events, such as extra Structured Briefing (STBF), are not specified to allow flexibility in regards to the students' needs.

In order that both students could be Planner controller and Executive controller simulation would be of 'double' construction (either same traffic handled twice or different traffic corresponding to the same objectives handled successively).



Thus simulation are always of 2 periods duration.

During each of the two periods there are briefing plus practical training plus debriefing. For example: 5 min. briefing + 45 min. exercise + 10 min. debriefing = 60 min. 50 simulations therefore last 100 periods and will be noted 100 periods in the training plans.

Such a definition allows simplicity and consistency: 100 periods mean that the student is actively trained during 100 periods. This seems obvious but is not the case in all timetable systems.

#### 4.1.2 Example of Timetable

Table 3 summarises the number of periods per subject and the training event types. The columns detail a subject and the rows indicate the type of training event.

For instance, the planning for the subject Aircraft (ACFT) is: 1 period of Computer-based Presentation Exercise (CBPE), 4 periods of Computer-based Training (CBT), 13 lectures or lessons (Lect./Lesson), 13 Part-Task Practice (PTP). This is a total of 31 periods.

Note that during simulations objectives from other subjects, i.e. ACFT and Unusual/Emergency Situations (UNIN), are addressed but the simulations (SIMUL) are noted in the ATM and Degraded Systems Capability (DEGS) columns, because these are the most numerous objectives of the simulations.

This example is more detailed in [4.2](#) and [4.3](#).

Table 3: Module 7 - ACC surveillance rating with radar endorsement

	TOTAL	INTR	LAW	ATM	MET	NAV	ACFT	HUM	EQPM	PENV	UNIN	DEGS
CASE	12			3				2			7	
CBPE	3			2			1					
CBT	33			15		8	4	3		3		
Lect./Lesson	84	5	9	12		5	13	16	10	2	6	6
PTP	60			43			13		4			
SA	1					1						
STBF	7		1	6								
SIMUL	100			90								10
Visit	23	2							5	16		
Other	12								7	5		
TOTAL	335	7	10	171	0	14	31	21	26	26	13	16



## 4.2 Training Requirements: Training Event Coverage

The Training Event Coverage tables indicate how the Training Events 'cover' each particular subject.

These tables list the type, duration, code and title of each Training Event. This title highlights one of the objectives included in the Training Event. This view on the training requirements is completed by the training plans.

The next level in order to detail the coverage is the production of the Training Event Plans. Training Event Plans list all the objectives included in each training event.

### 4.2.1 Introduction

Training Event Type	Title	Duration	Code
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Course Management	1	INTR LES71
	Training Ethos and Assessment	1	INTR LES72
<b>Lect.</b>	Course Introduction	1	INTR LEC71
	Course Introduction	1	INTR LEC72
	Organisation of Simulation	1	INTR LEC73
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>	Library	1	INTR VIS71
	Simulator	1	INTR VIS72
<b>Other</b>			
<b>Total</b>		7	

**4.2.2 Aviation Law**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Services	1	LAW LES71
	Reports	1	LAW LES72
	Airspace	1	LAW LES73
	General, VFR and IFR Rules	2	LAW LES74
	Pilots Flight Plans	1	LAW LES75
	Holding	1	LAW LES77
	Licence and Rating	1	LAW LES78
	Procedures used Following an Incident/Accident	1	LAW LES79
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>	Airspace	1	LAW STBF71
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		10	

### 4.2.3 Air Traffic Management

Training Event Type	Title	Duration	Code	
<b>CASE</b>	ATM Communications	2	ATM CAS 71	
	Need for Phraseology	1	ATM CAS 72	
<b>CBPE</b>	Flight Information	1	ATM CBPE71	
	Area of Responsibility	1	ATM CBPE72	
<b>CBT</b>	Limits of Responsibility	5	ATM CBT71	
	Traffic Information	1	ATM CBT72	
	Radar Information	3	ATM CBT73	
	Radar Separation	1	ATM CBT74	
	Longitudinal Separation (RE)	1	ATM CBT75	
	Radar Identification (PSR)	2	ATM CBT76	
	Radar Identification (SSR)	2	ATM CBT77	
	<b>Lesson</b>	Division of Responsibility	1	ATM LES71
		Messages and Signals	1	ATM LES72
		Interactions with Supervisor	1	ATM LES73
Principles of Airspace Management		1	ATM LES74	
Organisation of Traffic Flows		1	ATM LES75	
Radar Coverage		1	ATM LES76	
Capacity		1	ATM LES77	
Communications		1	ATM LES78	
Mode S		1	ATM LES79	
Operational Environment		1	ATM LES711	
Radar Control		1	ATM LES712	
Radar Identity				
<b>PTP</b>	Area of Responsibility	5	ATM PTP71	
	Traffic Information	2	ATM PTP72	
	Radar Information	3	ATM PTP73	
	Airspace Management	3	ATM PTP74	
	Flow Management	1	ATM PTP75	
	Level Allocation	2	ATM PTP76	
	Tools for Co-ordination	1	ATM PTP77	
	Radar Separation and Vectoring	5	ATM PTP78	

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
	Vertical Separation	5	ATM PTP79
	Longitudinal Separation	3	ATM PTP710
	Delegation of Separation	1	ATM PTP711
	Use of Data Display	4	ATM PTP712
	Holding Patterns	3	ATM PTP713
	Radar Identity	5	ATM PTP714
<b>SA</b>			
<b>STBF</b>	Demand and Capacity	1	ATM STBF71
	Co-ordination (analysis)	1	ATM STBF72
	Co-ordination (application)	1	ATM STBF73
	Wake Turbulence	1	ATM STBF74
	Operational Environment	1	ATM STBF75
	Holding Patterns	1	ATM STBF76
<b>SIMUL</b>	Simulations	90	SIM 711 to SIM 7312
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		171	

**4.2.4 Meteorology**

There is no Training Event entirely dedicated to Meteorology (MET). Basic objectives have been trained in the basic course. Other objectives are processed during ATM simulations.

**4.2.5 Navigation**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>	Navigational Assistance	8	NAV CBT71
<b>Lesson</b>	Applied Navigation	1	NAV LES71
<b>Lect.</b>	Information on Future Navigation techniques	4	NAV LECT71
<b>PTP</b>			
<b>SA</b>	NAV PRESIM SA 01	1	NAV SA71
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		14	

**4.2.6 Aircraft Performance**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>	Cockpit Instrument	1	ACFT CBP71
<b>CBT</b>	Aircraft Performances	4	ACFT CBT71
<b>Lesson</b>	Cockpit Instruments	2	ACFT LES71
	Wake Turbulence Categories	1	ACFT LES72
	ICAO Aircraft Categories	2	ACFT LES73
	Climb	1	ACFT LES74
	Cruise	1	ACFT LES75
	Descent	1	ACFT LES76
	Economic Factors	1	ACFT LES77
	Climb Techniques	1	ACFT LES78
	Direct Routing	1	ACFT LES79
	Operational Requirements	1	ACFT LES710
	Antenna Shadowing	1	ACFT LES711
<b>PTP</b>	Integration of Performances	2	ACFT PTP71
	Integration of Pilot Information	2	ACFT PTP72
	Planning	1	ACFT PTP73
	Climb	2	ACFT PTP74
	Cruise	2	ACFT PTP75
	Descent	2	ACFT PTP76
	Economic Factors	2	ACFT PTP77
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		<b>31</b>	

**4.2.7 Human Factors**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>	Safer Case	2	HUM CAS71
<b>CBPE</b>			
<b>CBT</b>	Safer	3	HUM CBT71
<b>Lesson</b>	Minimising Stress	1	HUM LES710
	Effects of Shocking Events	1	HUM LES711
	Procedures after Incidents/Accidents	2	HUM LES712
		1	HUM LES713
	Efficiency	1	HUM LES71
	Decision-making	1	HUM LES72
	Fatigue	1	HUM LES73
	Personal Fitness	1	HUM LES74
	Social and Organisational Factors	1	HUM LES75
	Team Relations	2	HUM LES76
	Reports	2	HUM LES77
	Verbal and non-verbal communication	1	HUM LES78
		1	HUM LES79
	Stress		
	Helplessness		
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		21	

4.2.8 Equipment and Systems

Training Event Type	Title	Duration	Code
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Operational Position	1	EQPM LES71
	Professional Knowledge	2	EQPM LES72
	Radio Range	1	EQPM LES73
	Two-way Communications	1	EQPM LES4
	Code Management	1	EQPM LES75
	Future Developments	1	EQPM LES76
	AFTN	2	EQPM LES77
	Systems Limits	1	EQPM LES78
<b>Lect.</b>			
<b>PTP</b>	Direction Finder	2	EQPM PTP71
	Data Transfer	1	EQPM PTP72
	Radar Equipment	1	EQPM PTP73
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>	EQPM Sup Practice Visit 01	2	EQPM VIS71
	EQPM Sup Practice Visit 02	3	EQPM VIS72
<b>Other (hands on)</b>	Simulator	3	EQPM HA71
	Radio Equipment	2	EQPM HA72
	Direction Finding	1	EQPM HA73
	Coms and Radars	1	EQPM HA74
<b>Total</b>		26	



**4.2.9 Professional Environment**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>	Introduction to ATM	3	PENV CBT71
<b>Lesson</b>	Knowledge Updating	2	PENV LES71
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>	Visit to an Upper Centre	4	PENV VISUC
	Visit to an Adjacent Approach	4	PENV VISAP
	Visit to an Air Defence Centre	4	PENV VISDE
	Visit to an Airport Tower	4	PENV VISTW
<b>Other</b>	PENV Flight Simulations	5	PENV FSIM71
<b>Total</b>		26	

**4.2.10 Unusual/Emergency Situations**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>	Aircraft Problems	4	UNIN CAS71
	Hijack	3	UNIN CAS72
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Traffic Information	2	UNIN LES71
	Transponder Failure	1	UNIN LES72
	Radio Failure	2	UNIN LES73
	Diversion	1	UNIN LES74
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		13	

**4.2.11 Degraded Systems Capability**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Ground Equipment	1	DEG LES71
	Equipment Degradation	1	DEG LES72
	Data Transmission	1	DEG LES73
	Surveillance Equipment	1	DEG LES74
	System Degradation	1	DEG LES75
	Navigational Equipment Failure	1	DEG LES76
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>	Degraded situation 1-5	10	DEG SIM 71
			DEG SIM 72
			DEG SIM 73
			DEG SIM 74
			DEG SIM 75
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		16	

### 4.3 Training Requirements: Training Plans

In these Training Plans some objectives are not linked to a training event. This means that:

- either the 'parent' objective (general or main) is linked to a training event and this is considered sufficient to cover the 'child' objective,
- or the objective was addressed in basic training and is just there as a reminder (example: Law 1.3.1).

The tables figuring the training plans are divided in five columns which include the data related to the objectives:

Objectives	Training Content	Level	Type of Training Event	Educational Material and References
------------	------------------	-------	------------------------	-------------------------------------

Table width rows are included to group the objectives by topics:

<b>Topics</b>
---------------

The objectives below the row are related to the topic of the row:

Topic 1	
Objective 1.1	
Topic 2	
Objective 2.1	
<b>Topic 2.1</b>	
Objective 2.1.1.	
Objective 2.1.2	

**ACC Surveillance Rating with Radar Endorsement**

INTR		INTRODUCTION TO THE COURSE			
Objectives	Training Content	L	Type of Training Event	Educational Material and References	
L = Level					
1	Students shall know and understand the training programme that they will follow during the institutional rating training				
<b>1 Course Management</b>					
1.-.1	Students shall explain the aims and objectives of the course, the management structure and recognise the materials to be used		Lesson <i>Lesson RSTD AV GTMD</i>		
<b>1.1 Course Introduction</b>					
1.1.1	Explain the aims and main objectives of the course	Course objectives for the specific rating/endorsement	2	Lect. <i>LECT. RSTD AV GTMD</i>	
<b>1.2 Course Administration</b>					
1.2.1	Name the course leader and principal instructors		1	Lect. <i>LECT. RSTD AV GTMD</i>	
<b>1.3 Study Material and Training Documentation</b>					
1.3.1	Choose appropriate documentation for course studies	Library, CBT library	3	Lect. <i>LECT. RSTD AV GTMD</i>	

INTR	INTRODUCTION TO THE COURSE			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
1.3.2 Integrate appropriate documentation into the course	Library, CBT library	4	Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
<b>2 Introduction to the ATC Training Course</b>				
2.-.1 Students shall state the methodology and describe the assessment procedures used in the course			Lect. <i>Lect</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>2.1 Course Content</b>				
2.1.1 State the different methods of teaching the subjects	Theoretical training, practical training, self-study, taxonomy, action verbs	1	Lect. <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.1.2 Describe, in general terms, the content of the subjects		2	Lect. <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.1.3 Describe the organisation of theoretical training		2	Lect. <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.1.4 Describe the organisation of simulation training	Structure of participation, simulation exercises, briefing, debriefing	2	Lect. <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

INTR	INTRODUCTION TO THE COURSE			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Visit-Grp  <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
<b>2.2 Training Ethos</b>				
2.2.1 Recognise the feedback mechanisms available	Instructor discussions, training progress, assessment, results, briefing, debriefing	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.2.2 Describe the positive effect in working together with fellow course participants	How the influence of interactive studies can lead to success	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>2.3 The Assessment Process</b>				
2.3.1 Describe the assessment procedure	The assessment process applied during the course and associated re-sit procedures	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

**ACC Surveillance Rating with Radar Endorsement**

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
--.1 Students shall: i. appreciate the principles of aviation law; ii. know, understand and apply the Rules of the Air and Regulations, including airspace and flight planning; iii. appreciate the authority vested in the controller and the means by which that authority is exercised				
<b>1 Rules and Regulations</b>				
1.-.1 Students shall explain and apply the Rules and Regulation which affect ATC operations				
<b>1.1 General</b>				
1.1.1 Differentiate between the Air Navigation Services	ICAO Doc 9161- ATM (ATS, ATFM, ASM)	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
1.1.2 Explain the considerations which determine the need for the Air Traffic Services (ATS)	ICAO ANNEX 11 Chapter 2	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
1.1.3 Differentiate between the ATS	ATC Service, advisory service, FIS, alerting service	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	



LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

1.2 Reports				
1.2.1 State the standard forms for reports	e. g. incident/accident, airmisss/airprox, breach of regulations, watch/log book, records	1	Lesson <i>Lesson RSTD AV GTMD</i>	Sample form
1.2.2 Describe the functions of, and processes for, reporting	e. g. incident/accident, airmisss/airprox, breach of regulations, watch/log book, records	2	Lesson <i>Lesson RSTD AV GTMD</i>	
1.2.3 Use the standard forms for reporting	ICAO Doc 4444, Appendix 4	3	Lesson <i>Lesson RSTD AV GTMD</i>	Blank form
1.2.4 Explain the use of air traffic incident/accident report form	ICAO Doc 4444 Part 2, national regulations	2	Lesson <i>Lesson RSTD AV GTMD</i>	
1.2.5 Use the ICAO air traffic incident/accident report form	ICAO Doc 4444	3	Lesson <i>Lesson RSTD AV GTMD</i>	Blank form
1.2.6 Use the national air traffic incident/accident report form		3	Lesson <i>Lesson RSTD AV GTMD</i>	Blank form

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.3    Airspace</b>				
1.3.1 Appreciate types of airspace and their relevance to ACS/RAD control	Classes A- G as appropriate, national classifications	3		
1.3.2 Provide planning, co-ordination and control actions appropriate to the airspace classification	ICAO Annex 2, ICAO Annex 11, national requirements (AIP), international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, airspace structure NOTE: the simulated environment must be related to the specific rating and take account of the local airspace classification requirements	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>   PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
1.3.3 Appreciate the structure of airspace and its relevance to the ACS/RAD rating	ICAO Annex 2, ICAO Annex 11, national requirements (AIP), international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, airspace structure	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.3.4 Provide planning, co-ordination and control actions appropriate to the airspace structure	ICAO Annex 2, ICAO Annex 11, national requirements (AIP), international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, airspace structure NOTE: the simulated environment must be related to the specific rating and take account of the local airspace structure requirements	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>1.4 Rules of the Air</b>				
1.4.1 Provide planning, co-ordination and control actions appropriate to the General Rules	ICAO Annex 2, ICAO Annex 11, Chapter 3 NOTE: The simulated environment must be related to the specific rating and take account of the appropriate Rules	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.4.2 Provide planning, co-ordination and control actions appropriate to the VFR, IFR, and meteorological flying conditions	ICAO Annex 2, ICAO Annex 11, Chapters 4 and 5 NOTE: The simulated environment must be related to the specific rating and take account of the appropriate Rules	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
1.4.3 Provide planning, co-ordination and control actions appropriate to the rules for minimum safe height and terrain clearance	Responsibility for terrain clearance, terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>1.5 Flight Plans</b>				
1.5.1 Obtain flight plan information in order to provide Air Traffic Services (ATS)	Types of FPL (RPL, AFIL, etc.), supplementary information	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	Sample FPL
1.5.2 Use flight plan information in order to provide ATS	Types of FPL (RPL, AFIL, etc.), supplementary information	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	Film/Video

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	Blank form
1.5.3 Appreciate the pilot's responsibilities in relation to adherence to flight plan	Inadvertent changes, intended changes, position reporting	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>1.6 National Legislation and Procedures</b>				
1.6.1 Describe the methods by which national regulations are implemented in the ACS/RAD rating		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>1.7 Special National Legislation and Procedures</b>				
1.7.1 Provide planning, co-ordination and control actions in accordance with special national legislation and procedures	e.g. security, environmental (noise abatement, conservation areas fuel jettisoning), sensitive areas (hospitals, VIP residences), priority allocation, special purpose codes	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>2 Holding</b>				
2.-1 Students shall describe holding patterns and procedures				

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.1 Holding IFR</b>				
2.1.1 Describe types of holding patterns	Published, non-published, extended Link to ATM 10	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.1.2 Describe an ICAO holding pattern	ICAO Doc 8168- Parts of an IFR holding pattern, entry/exit procedures, dimensions of patterns, protected airspace, holding areas, alignment, rates of turns, holding times, expect further clearance, Expected Approach Times (EATs) Link to ATM 10	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	Video
2.1.3 Describe the use and purpose of holding	Effect of speed, effect of level used, effect of navigation aid in use	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	Video
<b>3 ATC Licensing</b>				
3.-.1 Students shall appreciate the legal aspects associated with the ATC Licence ('European Manual of Personnel Licensing - Air Traffic Controllers' [EATMP, 2000c])			Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

<b>3.1 Privileges and Conditions</b>				
3.1.1 Describe the conditions which must be met for the issue and maintenance of the ACS/RAD rating		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
3.1.2 Describe the privileges associated with the ACS/RAD rating		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>3.2 Incident/Accident</b>				
3.2.1 Explain the procedures used following an incident/accident	National regulations	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	Additional

**ACC Surveillance Rating with Radar Endorsement**

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1 Students shall apply operational procedures to ensure a safe, orderly and expeditious service				
<b>1 Air Traffic Services and Airspace Management</b>				
1.-.1 Student shall provide the appropriate service				
<b>1.1 Air Traffic Control Services</b>				
1.1.1 Provide the appropriate air traffic control services	ICAO ANNEX 11, ICAO Doc 7030, ANNEX 11, Doc 4444, national docs, operation manuals	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.1.2 Appreciate own area of responsibility	NOTE: The simulated environment must be related to the specific rating	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	Video



ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

<b>1.2 Flight Information Service (FIS)</b>				
1.2.1 Explain the responsibility for the provision of a FIS	ICAO Doc 4444, Part 2	2	CBPE  <i>Lesson</i> RSTD VIS GTMD	
1.2.2 Relay appropriate information concerning the location of other conflicting traffic	Traffic information, essential traffic information	3	PTP  <i>Pre Simul</i> RSTD PTT ITMD  CBT  <i>Inter</i> Self MMC ITMD  CBPE  <i>Lesson</i> RSTD VIS GTMD	
1.2.3 Provide FIS	ICAO Doc 4444	4	Team Simul  <i>SIMUL</i> REAL SIM ITMD	
1.2.4 Use radar for the provision of FIS	ICAO Doc 4444, information to identified aircraft concerning: traffic, weather, navigation	3	CBT  <i>Inter</i> Self MMC ITMD  PTP  <i>Pre Simul</i> RSTD PTT ITMD	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.3 Alerting Service</b>				
1.3.1 Explain the responsibility for the provision of an alerting service	ICAO ANNEX 11	2	CBPE  <i>Lesson</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
1.3.2 Provide appropriate action in abnormal situations	ICAO Doc 4444 - Special codes, seek assistance (TRM), checklist, national legislation/requirements, overdue action, emergency action, uncertainty, alert, distress	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
1.3.3 Respond to distress and urgency messages and signals		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.3.4 Apply national requirements in abnormal situations	Priority allocation, special purpose codes	3		
1.3.5 Co-ordinate with RCC		4	STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.3.6 Provide appropriate action in abnormal situations using radar derived information		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
<b>1.4 Air Traffic Flow Management (ATFM)</b>				
1.4.1 Apply principles of ATFM	Working principles of ATFM, flexible use of airspace, free flight	3	Team Simul  <i>SIMUL REAL SIM ITMD</i>  PTP  <i>Pre Simul RSTD PTT ITMD</i>	
1.4.2 Organise traffic flows and patterns to take account of airspace boundaries	Civil and military, controlled, uncontrolled, advisory, restricted, danger, prohibited, special rules, sector boundaries, national boundaries, FIR boundaries, delegated airspace, transfer of control, transfer of communications, en-route, off route Link to Aviation Law 1.3.	4	Lesson  <i>Lesson RSTD AV GTMD</i>  PTP  <i>Pre Simul RSTD PTT ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  CBPE  <i>Lesson</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
1.4.3 Organise traffic flows and patterns to take account of radar coverage		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.4.4 Organise traffic flows and patterns to take account of areas of responsibility	En-route ACC	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  CBPE  <i>Lesson</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
1.4.5 Balance demand against capacity	Capacity of adjacent sectors, capacity of own sector, evaluation of personal traffic load, evaluation of other sources of predicted traffic load	5	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.4.6 Inform supervisor of situation	e.g. abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, relevant information (e.g. reported ground-based incidents forest fire smoke, oil pollution), unusual meteorological conditions	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.4.7 Apply flow management procedures		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
<b>1.5 Airspace Management (ASM)</b>				
1.5.1 Appreciate the working principle of ASM	FUA	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.5.2 Organise traffic to take account of ASM	Conditional routes	4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>2 Communication</b>				
2.-.1 Students shall appreciate the necessity for effective communication and use approved phraseology				
<b>2.1 Effective Communication</b>				
2.1.1 Analyse examples of pilot and controller communication for effectiveness		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Cases  <i>Cases</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
2.1.2 Explain the need for approved phraseology	ICAO Doc 4444, Part 10, RTF Manual, standard words and phrases as contained in ANNEX 10 Chapter 5	2	Cases  <i>Cases RSTD MMC ITMD</i>	
2.1.3 Use ICAO-approved phraseology	ICAO Doc 4444 Part 10 RTF Manual, standard words and phrases as contained in ANNEX 10 Chapter 5	3	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
2.1.4 Use national approved phraseology when applicable		3		
2.1.5 Perform communication effectively	Transmission techniques	3	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
<b>2.2 Phraseology for Unusual Events</b>				
2.2.1 Analyse examples of pilot and controller communication for effectiveness (case of unusual events)		4	Lesson  <i>Lesson RSTD AV GTMD</i>  Cases  <i>Cases RSTD MMC ITMD</i>	
2.2.2 Interpret the rules to provide an effective service where approved phraseology is not available	Receiver only, transmitter only, speechless aircraft, incomplete messages	5	Cases  <i>Cases RSTD MMC ITMD</i>	



ATM	AIR TRAFFIC MANAGEMENT													
Objectives	Training Content	L	Type of Training Event	Educational Material and References										
L = Level														
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			Team Simul											
			SIMUL REAL HI FI SIM ITMD											
<b>2.3 Mode S Data Transfer</b>														
2.3.1 Appreciate the use of Mode S	Data which can be exchanged, limitations, advantages, disadvantages	3	Lesson  <i>Lesson RSTD AV GTMD</i>											
<b>3 ATC Clearances and Instructions</b>														
3.-.1 Students shall issue appropriate clearances and instructions			Team Simul  <i>SIMUL REAL HI FI SIM ITMD</i>											
<b>3.1 ATC Clearances</b>														
3.1.1 Provide appropriate ATC clearances	e.g. climb, joining, en-route	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>											
<b>3.2 ATC Instructions</b>														
3.2.1 Provide appropriate ATC instructions	e.g. SSR Code	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>											

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>4 Co- ordination</b>				
4.-.1 Students shall understand the need for, and conduct co-ordination				
<b>4.1 Necessity</b>				
4.1.1 Identify the need for co-ordination		3		
<b>4.2 Tools and Methods</b>				
4.2.1 Use the available tools for co-ordination methods	e.g. electronic transfer of flight data, telephone, interphone, intercom, direct speech, Radio Telephone (RTF), local agreements	3	PTP  <i>Pre Simul</i> RSTD PTT ITMD  Team Simul  SIMUL REAL SIM ITMD	
<b>4.3 Co-ordination Procedures</b>				
4.3.1 Initiate appropriate co-ordination	Delegation/transfer of responsibility for air/ground communications and separation, release point, transfer of control	3	PTP  <i>Pre Simul</i> RSTD PTT ITMD  Team Simul  SIMUL REAL SIM ITMD	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
4.3.2 Analyse effect of co-ordination requested by an adjacent operational position	Delegation/transfer of responsibility for air/ground communications and separation, release point, transfer of control	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
4.3.3 Select, after negotiation, an appropriate course of action	Including the cases: when additional traffic cannot be accepted by adjacent control position, when additional traffic cannot be accepted by own control position	5	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
4.3.4 Ensure that the agreed course of action is carried out		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>5 Altimetry and level Allocation</b>				
5.-.1 Students shall allocate appropriate levels to aircraft			Team Simul  <i>SIMUL REAL HI FI SIM ITMD</i>	
<b>5.1 Altimetry</b>				
5.1.1 Calculate appropriate levels	e.g. Transition Level (TRL), transition layer, height, flight level, altitude, vertical distance to airspace boundaries	3	PTP  <i>Pre Simul RSTD PTT ITMD</i>	
5.1.2 Allocate levels (height, altitude, flight level) according to altimetry data		4	PTP  <i>Pre Simul RSTD PTT ITMD</i>	
5.1.3 Ensure separations according to altimetry data	e.g. Transition Level (TRL), transition layer, height, flight level, altitude, vertical distance to airspace boundaries	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>	
<b>5.2 Terrain Clearance</b>				
5.2.1 Integrate safe vertical distance from terrain into control actions	e.g. lowest available flight level, minimum safe altitude, Minimum Sector Altitude (MSA)	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>	
5.2.2 Ensure safe vertical distance from terrain	e.g. radar vectoring area, lowest available flight level, minimum safe altitude, Minimum Sector Altitude (MSA)	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>6 Separation Standards</b>				
6.-.1 Students shall select and maintain appropriate separation between aircraft				
<b>6.1 Radar Separation</b>				
6.1.1 Describe how radar separation is applied	On a analogue radar display, on a synthetic radar display, between primary radar blips, between secondary radar responses, primary vs secondary Radar Position Symbols (RPS)	2	CBT  <i>Inter Self MMC ITMD</i>	
6.1.2 Provide radar separation	ICAO Doc 4444, ICAO Doc 7030, standard, increased, reduced, emergency separations, speed control	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>  Team Simul  <i>SIMUL REAL SIM ITMD</i>	
6.1.3 Provide radar separation by practising radar vectoring in a variety of situations	Transit, meteorological phenomena, vectoring for approach, departure vs. transit vs arrival	4	PTP  <i>Pre Simul RSTD PTT ITMD</i>  Team Simul  <i>SIMUL REAL SIM ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

<b>6.2 Vertical Separation</b>				
6.2.1 Provide standard vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent, RVSM	4	PTP  <i>Pre Simul</i> RSTD PTT ITMD	
6.2.2 Provide increased vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	PTP  <i>Pre Simul</i> RSTD PTT ITMD  Team Simul  SIMUL REAL SIM ITMD	
6.2.3 Provide reduced vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	PTP  <i>Pre Simul</i> RSTD PTT ITMD  Team Simul  SIMUL REAL SIM ITMD	
6.2.4 Provide emergency vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	PTP  <i>Pre Simul</i> RSTD PTT ITMD	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
6.2.5 Provide vertical separation in a radar environment	Into/out of radar cover, radar failure, Mode C derived information	4	PTP  <i>Pre Simul</i> RSTD PTT ITMD  Team Simul  SIMUL REAL SIM ITMD	
<b>6.3 Horizontal Separation</b>				
6.3.1 Provide longitudinal separation in a radar environment	Within radar coverage, speed control, mach number speed control	4	CBT  <i>Inter</i> Self MMC ITMD  PTP  <i>Pre Simul</i> RSTD PTT ITMD	
<b>6.4 Delegation of Separation</b>				
6.4.1 Delegate separation in the case of aircraft continuing visually		4	Team Simul  SIMUL REAL SIM ITMD  PTP  <i>Pre Simul</i> RSTD PTT ITMD	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
6.4.2 Delegate separation to pilots in the case of VMC climb/descent		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>6.5 Wake Turbulence Separation</b>				
6.5.1 Provide wake turbulence separation		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
<b>7 Data Display</b>				
<b>7.1 Data Management</b>				
7.1.1 Update the data display to accurately reflect the traffic situation	Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs	3	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	



ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
7.1.2 Analyse pertinent data on data displays		4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
7.1.3 Organise pertinent data on data displays		4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>8 Operational Environment</b>				
8.-.1 Students shall recognise and maintain the integrity of the simulated operational environment			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>	
<b>8.1 Integrity of the Operational Environment</b>				
8.1.1 Obtain information concerning the operational environment	e.g. briefing, take-over, notices, local orders, verify information	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
8.1.2 Check and maintain the integrity of the operational environment	e.g. integrity of displays, verify the information provided by displays	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
8.1.3 Inform the relieving controller of the operational environment	e.g. briefing, take-over, notices, local orders, verify information	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>8.2 Verification of the Currency of Operational Procedures</b>				
8.2.1 Check all relevant documentation before managing traffic	e.g. briefing, LOA, NOTAM, AIC	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
8.2.2 Apply procedural changes while managing traffic		3	STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
<b>9 Provision of Control Service</b>				
9.-.1 Students shall provide an appropriate control service, applicable to the specific rating viz ACC surveillance rating with radar endorsement	ICAO Doc 4444, national requirements		Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

9.1 General				
9.1.1 Describe the division of responsibility between air traffic control units	ICAO Doc 4444, national requirements	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
9.1.2 Describe the responsibility in regard to military traffic	ICAO Doc 4444, national requirements	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
9.1.3 Obtain operational information	ICAO Doc 4444, local operational manuals	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
9.1.4 Interpret operational information		5	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
9.1.5 Organise forwarding of operational information into control decisions		4		
9.1.6 Integrate operational information into control decisions		4		
<b>9.2 Area Control with Radar</b>				
9.2.1 Explain the responsibility for the provision of an ACC radar control service	ICAO Doc 4444, local operational manuals	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
9.2.2 Explain the functions that can be performed with the use of radar derived information in an ACC radar control service	ICAO Doc 4444	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>10 Holding</b>				
10.-.1 Student shall manage holding traffic			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>10.1 Holding</b>				
10.1.1 Use holding patterns	ICAO Doc 4444, separation from holding patterns Link to Aviation Law 2	3	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
10.1.2 Issue holding instructions		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.3 Calculate expected onward clearance times		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
10.1.4 Consider the effect of: wind, aircraft, speed, rate of turn, height, aircraft type, aircraft performance		2	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.5 Allocate holding levels		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.6 Provide vertical separation between aircraft in a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.7 Provide vertical separation between aircraft in a holding pattern and transiting aircraft		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>10.2 Holding in a Radar Environment</b>				
10.2.1 Provide vectors to aircraft entering a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.2.2 Ensure vertical separation exists before radar separation is lost		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
10.2.3 Provide vectors to transiting aircraft to ensure radar separation from a holding area		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.2.4 Provide vectors to aircraft leaving a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.2.5 Ensure re-identification of aircraft leaving a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.2.6 Maintain vertical separation until radar separation is established		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>11 Radar Identification</b>				
11.-.1 Students shall: i. establish and maintain radar identification; ii. respond to a loss of radar identification			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>11.1 Establishment of Radar Identification</b>				
11.1.1 Apply the methods of establishing radar identification using primary radar	ICAO Doc 4444	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	



ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
11.1.2 Appreciate the precautions when establishing radar identification using primary radar		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
11.1.3 Apply methods of establishing radar identification using secondary radar		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
11.1.4 Appreciate the precautions when establishing radar identification using secondary radar		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
11.1.5 Apply procedures in the case of misidentifications		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>11.2 Maintenance of Radar Identification</b>				
11.2.1 Appreciate the necessity to maintain radar identification at all times		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>11.3 Loss of Radar Identity</b>				
11.3.1 Appreciate when an aircraft identification is lost or in doubt	e.g. out of radar coverage, loss of radar service, weather clutter, other clutter, garbling	3	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
11.3.2 Apply methods to re-establish radar identification		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
11.3.3 Respond to loss/doubt concerning radar identification	Non-radar procedures	3	PTP  <i>Pre Simul</i> RSTD PTT ITMD  Team Simul  SIMUL REAL SIM ITMD	
<b>11.4 Position Information</b>				
11.4.1 Appreciate the circumstances when radar position information should be passed to the aircraft		3	PTP  <i>Pre Simul</i> RSTD PTT ITMD	
<b>11.5 Transfer of Identity</b>				
11.5.1 Apply the methods of transfer of radar identification		3	Lesson  <i>Lesson</i> RSTD AV GTMD  PTP  <i>Pre Simul</i> RSTD PTT ITMD	
11.5.2 Appreciate the precautions when transferring radar identification		3	Lesson  <i>Lesson</i> RSTD AV GTMD	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
			PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

L = Level

**ACC Surveillance Rating with Radar Endorsement**

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.-.1 Students shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS to ACC en-route traffic				
<b>1 Atmospheric Processes</b>				
1.-.1 Student shall calculate and integrate the minimum flight levels into their decision-making process				
<b>1.1 Air Pressure</b>				
1.1.1 Calculate the minimum applicable altitude/flight level being given appropriate meteorological data	Transition altitude, transition level, minimum flight level, transition layer Linked to ATM 5	3		
<b>2 Meteorological Phenomena</b>				
2.-.1 Students shall analyse and take account of meteorological phenomena in his control actions				

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.1 Planning and Co-ordination</b>				
2.1.1 Analyse data about meteorological phenomena	Wind, cloud, precipitation, pressure settings, thunderstorms, icing, jetstreams, Clear Air Turbulence (CAT), turbulence, microburst, marked mountain waves, lines squalls, solar radiation	4		
2.1.2 Integrate data into planning and co-ordination		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
<b>2.2 Weather Avoidance</b>				
2.2.1 Use radar vectoring techniques to avoid adverse weather when necessary/possible		3	PTP  <i>Pre Simul RSTD PTT ITMD</i>	

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
2.2.2 Use radar vectoring techniques to avoid areas of radar clutter		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
<b>2.3 Clearances and Instructions</b>				
2.3.1 Analyse data about meteorological phenomena	Wind, cloud, precipitation, pressure settings, thunderstorms, icing, jetstreams, Clear Air Turbulence (CAT), turbulence, microburst, marked mountain waves, line squalls, solar radiation	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.3.2 Integrate data into clearances and instructions		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

2.4 Information				
2.4.1 Obtain meteorological information	Wind, cloud, precipitation, pressure settings, thunderstorms, icing, jetstreams, Clear Air Turbulence (CAT), turbulence, microburst, marked mountain waves, line squalls, solar radiation	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.2 Relay meteorological information	To: aircraft, meteorological office, FIS	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.3 Decode meteorological information		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.4 Analyse data about meteorological phenomena		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.5 Integrate data into transmitted information		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	



**ACC Surveillance Rating with Radar Endorsement**

NAV	NAVIGATION			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.-.1 Students shall analyse all navigational aspects in order to organise the traffic				
<b>1 Applied Navigation</b>				
1.-.1 Students shall appreciate the information on maps and charts and integrate this into control decisions			Lesson <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  SA  <i>Pre Simul</i> <i>Self</i> <i>OTD</i> <i>ITMD</i>	
<b>1.1 Maps and Charts</b>				
1.1.1 Use maps and charts for planning and co-ordination purposes		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

NAV	NAVIGATION			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.2 Pilot Interpreted Ground-based System</b>				
1.2.1 Estimate the behaviour of aircraft according to the operational status of navigational ground-based systems	Limitations of navigation aids, status of NAVAIDs	3	Flight Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.3 On-Board Systems</b>				
1.3.1 Estimate the behaviour of aircraft according to the operational status of navigational on-board systems	Limitations of on-board navigation systems	3	Flight Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.4 Satellite-based Systems</b>				
1.4.1 Estimate the behaviour of aircraft according to the operational status of navigational satellite-based systems	GPS, GLONASS, GNSS	3	Flight Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.5 Future Developments</b>				
1.5.1 Be informed about existing projects and developments which will impact on the work in the future	e.g. briefing, seminars, courses, workshops, technical journals, aviation journals	0	Lect.  <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

NAV	NAVIGATION			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

1.6 Navigational Assistance				
1.6.1 Evaluate the necessary information to be provided to pilots in need of navigational assistance	e.g. nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other navigational assistance relevant at the time	5	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  Flight Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.6.2 Assist aircraft observed to be deviating from its known intended route		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  Flight Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

**ACC Surveillance Rating with Radar Endorsement**

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.-.1 Students shall assess aircraft performance to integrate it into traffic organisation				CBT
<b>1 Aircraft Instruments</b>				
1.-.1 Student shall understand the relevance of the cockpit information presented to the pilot				
<b>1.1 Cockpit Instruments</b>				
1.1.1 Integrate the information provided by the pilot into the traffic situation	Flight instruments, engine instruments, navigational instruments, NDB (ADF), VOR (TACAN), DME, ILS, MLS, additional Instruments, TCAS, SSR transponder, head up display, GPWS, wind shear indicator, weather radar, FMS, EFIS	4	Lesson  <i>Lesson</i> RSTD AV GTMD  PTP  <i>Pre Simul</i> RSTD PTT ITID  Team Simul  <i>SIMUL</i> REAL SIM ITMD	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>	
<b>2 Aircraft Types and Categories</b>				
2.-.1 Students shall characterise wake turbulence and ICAO approach categories				
<b>2.1 Wake Turbulence Categories</b>				
2.1.1 Characterise each wake turbulence category and explain how to prevent their effect on other aircraft		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
<b>2.2 Planning</b>				
2.2.1 Consider ICAO aircraft categories for planning purposes	Categories: A, B, C, D, E	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	CBT

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>3 Factors Affecting Aircraft Performance</b>				
3.-1 Students shall integrate aircraft performance factors in the provision of ACC control				
<b>3.1 Climb</b>				
3.1.1 Integrate the effect of factors affecting aircraft during climb into the analysis of traffic situations		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITID</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>3.2 Cruise</b>				
3.2.1 Integrate the effect of factors affecting aircraft during cruise into the analysis of traffic situations		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i>  ITID	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>3.3 Descent</b>				
3.3.1 Integrate the effect of factors affecting aircraft during descent into the analysis of traffic situations		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITID</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>3.4 Economic Factors</b>				
3.4.1 Integrate consideration of economic factors into control actions	Routing, flight level, speed, rates of climb or descent	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> ITID	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
3.4.2 Use continuous climb techniques where applicable		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
3.4.3 Use direct routing where applicable		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>3.5 Miscellaneous Factors</b>				
3.5.1 Integrate operational requirements into planning	e. g. military flying, calibration flights, aerial photography	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
3.5.2 Explain the effect of antenna shadowing on RTF communications		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	



ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
3.5.3 Explain the effect of antenna shadowing on SSR operation		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
3.5.4 Integrate factors affecting aircraft into planning	Message relays regarding performance	4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITID</i>	
3.5.5 Explain the operation of aircraft additional equipment	Radios (number of), emergency radios, SELCAL	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
3.5.6 Explain the operation of aircraft additional equipment	Oxygen masks, pressurisation, noise, interference	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
3.5.7 Explain the operation of aircraft additional equipment	Transponders: Mode A, Mode C, Mode S	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

**4 Aircraft Data**

4.-.1 Students shall: i. use the standard average performance data for the provision of ACC control; ii. recognise potential or actual emergency situations; iii. apply standard solutions in the case of simple situations				
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**4.1 Performance Data**

4.1.1 Integrate the known aircraft performance data into control action decisions	Rate of climb/descent, cruising speed, ceiling	4	PTP  <i>Pre Simul</i> RSTD PTT ITID  Team Simul  SIMUL REAL SIM ITMD  CBT  <i>Inter</i> RSTD MMC ITMD	
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**ACC Surveillance Rating with Radar Endorsement**

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1 Students shall: i. recognise the necessity to constantly extend their knowledge; ii. analyse factors which affect personal and team performance				
<b>1 Psychological Factors</b>				
1.-.1 Students shall relate psychological factors to the decision-making process				
<b>1.1 Cognitive</b>				
1.1.1 Describe the factors which influence decision-making	e.g. stress, learning, knowledge, fatigue, alcohol/drugs, distraction, interpersonal relations, TRM	2	Lesson <i>Lesson RSTD AV GTMD</i>	Video
1.1.2 Relate human factors to decision-making		4	Team Simul <i>SIMUL REAL HI FI SIM ITMD</i>	HUM Role Play01
<b>2 Medical and Physiological Factors</b>				
2.-.1 Students shall respond to fatigue and lack of personal fitness in the performance of their duties				

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.1 Fatigue</b>				
2.1.1 Describe the onset of fatigue	e.g. lack of concentration, listlessness, irritability, frustration	2	Lesson <i>Lesson RSTD AV GTMD</i>	
2.1.2 Recognise the onset of fatigue in self		3	Team Simul <i>SIMUL REAL HI FI SIM ITMD</i>	HUM Role Play02
2.1.3 Recognise the onset of fatigue in others		3	Team Simul <i>SIMUL REAL HI FI SIM ITMD</i>	HUM Role Play02
2.1.4 Respond to indications of fatigue in an appropriate manner		3	Team Simul <i>SIMUL REAL HI FI SIM ITMD</i>	HUM Role Play02
<b>2.2 Fitness</b>				
2.2.1 Recognise signs of lack of personal fitness		2	Lesson <i>Lesson RSTD AV GTMD</i>	
2.2.2 Describe actions when aware of lack of personal fitness		2	Lesson <i>Lesson RSTD AV GTMD</i>	

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>3 Social and Organisational Factors</b>				
3.-1 Students shall develop teamworking attitudes				
<b>3.1 Human Relations</b>				
3.1.1 Apply social and organisational factors to work with other team members		3	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>3.2 Team Resource Management (TRM)</b>				
3.2.1 State the objectives of TRM	'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)	1	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>3.3 Group Dynamics</b>				
3.3.1 Identify the professional relationships between members of the group		3	Lesson <i>Lesson RSTD AV GTMD</i>	'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)  'Human Factors Module: Critical Incident Stress Management' (EATCHIP, 1997)
3.3.2 Identify the reasons for conflict		3	Lesson <i>Lesson RSTD AV GTMD</i>	'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)  'Human Factors Module: Critical Incident Stress Management' (EATCHIP, 1997)

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
3.3.3 Describe actions to prevent repetitions		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)  'Human Factors Module: Critical Incident Stress Management' (EATCHIP, 1997)
3.3.4 Take account of TRM Programmes	TRM, CISM	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)  'Human Factors Module: Critical Incident Stress Management' (EATCHIP, 1997)
3.3.5 Respond to the application of TRM techniques	Role of members, allocation of responsibilities within the team, benefits of having other team members to rely on, safety aspects, assistance in abnormal situations	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
<b>4 Communication</b>				
4.-.1 Students shall: i. accurately complete written reports; ii. express themselves so as to be understood by other team members and colleagues				

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

4.1 Written Work				
4.1.1 Record information by writing effectively	e.g. strips, reports, log-books	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	Strips Sample/b
4.1.2 Pass information by writing effectively		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	Strips Sample/b

4.2 Verbal/Non-verbal Communication				
4.2.1 Recognise Human Communication Theory	e.g. different languages, air traffic language	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
4.2.2 Characterise the factors which affect verbal communication	e.g. speed of speech, frequency, volume, background noise	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
4.2.3 Characterise non-verbal communication	e.g. body language, facial expressions	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
4.2.4 Use language effectively in the practice of air traffic control		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>5 Stress</b>				
5.-.1 Students shall integrate stress management procedures in the performance of their duties				
<b>5.1 Stress</b>				
5.1.1 Recognise the effects of stress	Stress and its symptoms in self and in others	1	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>5.2 Helplessness</b>				
5.2.1 Respond to feelings of helplessness	Normal/abnormal situations	3	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>5.3 Stress Management</b>				
5.3.1 Act to relieve or minimise stress in self and/or others	The effect of personality in coping with stress, the benefits of active stress management	3	Lesson <i>Lesson RSTD AV GTMD</i>	'Human Factors Module: Stress' (EATCHIP, 1996b)
5.3.2 Obtain assistance in stressful situations	TRM, CISM, the benefits of offering and accepting help in stress situations	3	Team Simul <i>SIMUL REAL HI FI SIM ITMD</i>	



HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
5.3.3 Recognise the effect of shocking and stressful events	Self and others, abnormal situations, CISM, TRM	1	Lesson <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)  'Human Factors Module: Critical Incident Stress Management' (EATCHIP, 1997)
5.3.4 Consider the benefits of Critical Incident Stress Management (CISM)		2	Lesson <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
5.3.5 Explain the procedures used following an incident/accident	CISM, national/local procedures and/or regulations, counselling, human element	2	Lesson <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

6 Human Error				
6.-.1 Students shall be able to discuss the concept of human error			Cases <i>Cases</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
6.1 Human Error				
6.1.1 Explain the relationship between error and safety	Number and combination of errors, pro-active versus reactive approach to discovery of error	2	CBT <i>Inter</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	
6.1.2 State the different types of error	Slips, lapses, mistakes, violations	1	CBT <i>Inter</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	CBT

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
6.1.3 Differentiate between errors and violations		2	CBT  <i>Inter</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	
6.1.4 Describe error-prone conditions		2	CBT  <i>Inter</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	
<b>7 Working Methods</b>				
7.-.1 Students shall discuss the effect of human factor's considerations on efficiency				
<b>7.1 Efficiency</b>				
7.1.1 Consider, from a human factors point of view, the factors effecting efficiency in the provision of air traffic control	Own workload, adjacent sector workload, OJT, customer requirements, economy, ecology, safety	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>8 Working Knowledge</b>				
8.-.1 Students shall maintain and update professional knowledge				
<b>8.1 Controller Knowledge</b>				
8.1.1 Maintain and update professional knowledge to retain competence in the operational environment	e.g. briefing, LOAs, NOTAM, AICs, reports of accident/incident, VOLMET, ATIS, SIGMET	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	SIGMET Reports

**ACC Surveillance Rating with Radar Endorsement**

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
--.1 Students shall: i. demonstrate knowledge and understanding of the basic working principles of equipment that is in general use in ATC; ii. select and operate the appropriate equipment in order to provide a safe and efficient ATC service in a simulated environment				
<b>1 General</b>				
1.-.1 Students shall be familiar with typical equipment to be found in a control environment				
<b>1.1 ATC Equipment</b>				
1.1.1 Maintain the technical integrity of the operational position	Notification procedures, responsibilities	3	Lesson <i>Lesson RSTD AV GTMD</i>	
1.1.2 Operate the various items of equipment in the simulator	Electronic displays, flight progress board (strip display), meaning of colours	3	Hands on <i>Sup. Pract. RSTD Real GTMD</i>	
1.1.3 Operate all available equipment in abnormal situations		3	Hands on <i>Sup. Pract. RSTD Real GTMD</i>	

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.2 Controller Knowledge</b>				
1.2.1 Explain the importance of maintaining professional knowledge concerning new equipment		2	Lect.  <i>LECT. RSTD AV GTMD</i>	
1.2.2 List the available means to maintain professional knowledge	e.g. briefing, seminars, courses, workshops, technical journals, aviation journals, familiarisation flights	1	Lect.  <i>LECT. RSTD AV GTMD</i>	
<b>2 Radio</b>				
2.-.1 Students shall correctly operate the radio and Direction Finding Equipment				
<b>2.1 Radio Theory</b>				
2.1.1 Consider radio range	Transfer to another frequency, apparent radio failure, failure to get radio contact	2	Lesson  <i>Lesson RSTD AV GTMD</i>	
<b>2.2 Radio Communications</b>				
2.2.1 Operate two-way communication	Equipment, procedures, frequency selection, all available equipment in abnormal situations	3	Lesson  <i>Lesson RSTD AV GTMD</i>  Hands on  <i>Sup. Pract. RSTD Real GTMD</i>	

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
2.2.2 Check for indications of correct operation of radio equipment	Indicator lights, serviceability displays, selector/frequency displays	3	Hands on <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
2.2.3 Check for faulty operation of radio equipment	Indicator lights, serviceability displays, selector/frequency displays	3	Hands on <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
2.2.4 Initiate corrective action when faulty operation is detected	In accordance with local instructions and procedures	3	Hands on <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
<b>2.3 Direction Finding</b>				
2.3.1 Measure and decode Direction Finding information	e.g. VDF/UDF, QDM, QDR, QTE	3	Hands on <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
2.3.2 Use Direction Finding information to assist in managing a safe orderly and expeditious flow of traffic	ADF, UDF, VDF	3	PTP <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>3 Other Voice Communications</b>				
3.-.1 Students shall operate the communication equipment				

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>3.1 ATC Communications</b>				
3.1.1 Use telephone, interphone and intercom	In accordance with local instructions and procedures	3	Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
<b>4 Radar</b>				
4.-.1 Students shall use the radar equipment				
<b>4.1 Use of Radars</b>				
4.1.1 Operate radar equipment	Switch on and adjust settings in accordance with local instructions	4	Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
4.1.2 Operate appropriate anti-clutter devices	In accordance with local instructions, weather clutter, permanent echoes, unwanted targets	3	Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
4.1.3 Analyse the information provided by the radar equipment	Including: use, advantages, limitations	4	PTP <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>4.2 Secondary Radar</b>				
4.2.1 Explain code management	Normal codes, special codes, international, national, local	2	Lesson <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
4.2.2 Allocate codes		4		

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>5 Future Equipment</b>				
5.-.1 Students shall be aware of know future developments				
<b>5.1 New Developments</b>				
5.1.1 Be aware of future developments	Voice recognition, Mode S	0	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>6 Automation in ATS</b>				
6.-.1 Students shall extract appropriate information from automated data				
<b>6.1 Aeronautical Fixed Telecommunications Network (AFTN)</b>				
6.1.1 Identify and decode the information disseminated through AFTN	Aircraft movement messages, NOTAM, SNOWTAM, BIRDTAM	3	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>6.2 On-Line Data Interchange (OLDI)</b>				
6.2.1 Operate electronic data transfer equipment		3	PTP <i>Pre Simul RSTD PTT ITMD</i>	Comment
<b>7 Operational Positions</b>				
7.-.1 Students shall identify, interpret and operate the equipment				

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>7.1 General</b>				
7.1.1 Use equipment in an ACC operational position		3	Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
<b>7.2 Information Systems</b>				
7.2.1 Check availability of information material		3		
<b>7.3 Flight Data Systems</b>				
7.3.1 Integrate the flight data displays at operational positions	Working principles, duties, equipment in use	4	Visit-Grp <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	Comment
<b>8 Systems Limitations</b>				
8.-.1 Students shall understand the significance of system limitations				
<b>8.1 System and Equipment Limitations</b>				
8.1.1 Take account of the limitations of systems and equipment		2	Lesson <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	



**ACC Surveillance Rating with Radar Endorsement**

PENV	PROFESSIONAL ENVIRONMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
--.1 Students shall appreciate the need for close co-operation with other agencies				
<b>1 Study Visits and Customer Relations</b>				
1.-.1 When available, students shall participate in programmes to enhance their knowledge and understanding of ATC			Lesson <i>Lesson</i> RSTD AV GTMD	
<b>1.1 Flight Familiarisation and/or Flight Simulator</b>				
1.1.1 Enhance knowledge of the ATC users operation by participating in familiarisation flight and flight simulator programmes		3	Flight Simul  <i>SIMUL</i> REAL SIM ITMD	
<b>1.2 Other Units</b>				
1.2.1 Characterise other civil and military facilities	Study visits to: e.g. TWR, APP, ACC, AIS, RCC, air defence units	2	Visit-Grp  <i>Sup. Pract.</i> RSTD Real GTMD  Visit-Grp  <i>Sup. Pract.</i> RSTD Real GTMD	

PENV	PROFESSIONAL ENVIRONMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Visit-Grp  <i>Sup. Pract.</i> <i>RSTD</i> <i>Real</i> <i>GTMD</i>	
<b>1.3 Customer Relations</b>				
1.3.1 Appreciate the role of ATC as a service provider		3	CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	CBT
1.3.2 Appreciate the requirements of the users	e.g. civil and military operators, business users, private/sport aviation operators, airport authorities	3	CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	CBT

**ACC Surveillance Rating with Radar Endorsement**

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
--.1 Students shall manage air traffic in unusual situations				
<b>1 Unusual/Emergency Situations</b>				
<b>1.1 Aircraft Problems</b>				
1.1.1 List aircraft failures	e.g. engine failure, hydraulic failure, fire on board, lack of fuel, bird strike, transponder failure, decompression, a/c lost/unsure of position	1	Cases <i>Cases RSTD TXT GTMD</i>	'Controller Training in the Handling of Unusual Incidents' (EATMP, 1999)  ICAO, Annex 13
1.1.2 Apply the procedures for given unusual situations		3	Cases <i>Cases RSTD TXT GTMD</i>  Team Simul  <i>SIMUL REAL HI FI SIM ITMD</i>	'Controller Training in the Handling of Unusual Incidents' (EATMP, 1999)  ICAO, Annex 13
<b>1.2 Unknown Traffic</b>				
1.2.1 Apply the procedures in the case of unknown traffic	Inside controlled airspace, outside controlled airspace, IFR vs. VFR	3	Lesson <i>Lesson RSTD MMC GTMD</i>	'Controller Training in the Handling of Unusual Incidents' (EATMP, 1999)  ICAO, Annex 13

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.3 Radar Vectoring Outside Controlled Airspace</b>				
1.3.1 Explain the circumstances which may require aircraft to be vectored out of controlled airspace	Weather avoidance, emergency, traffic avoidance	2		
1.3.2 Apply procedures regarding vectoring out of controlled airspace	e.g. co-ordination, information to aircraft	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.4 Transponder Failure</b>				
1.4.1 Apply procedures in the event of a SSR transponder failure	e.g. total, partial, national regulations, ICAO Doc 4444, ICAO Doc 7030	3	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.5 Radio Failure</b>				
1.5.1 Apply procedures when a radar controller experiences complete or partial failure of ground radio communication equipment		3	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.5.2 Explain the procedures followed by a pilot when he experiences complete or partial radio failure	e.g. civil, military, special national procedures	2	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>	
1.5.3 Apply ATC procedures associated with a pilot experiencing complete or partial radio failure	e.g. civil, military, special national procedures	3	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.6 Diversions</b>				
1.6.1 Provide flight information to diverting aircraft	e.g. nearest most suitable aerodrome, aerodrome information	4	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>	

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.6.2 Provide flight information to other aircraft	e.g. concerning an emergency descent	4	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>	
1.6.3 Perform appropriate co-ordination	e.g. other sectors and units	3	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>	
1.6.4 Provide navigational assistance to diverting aircraft	Track/heading, distance, other navigational assistance	4	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.6.5 Provide radar vectoring to diverting aircraft	Track/heading, distance, other navigational assistance	4	CBPE  <i>Lesson</i> <i>RSTD</i> <i>Proj</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

1.7 Hijack				
1.7.1 Apply ATC procedures associated with hijack	National, international	3	Cases <i>Cases</i> <i>RSTD</i> <i>TXT</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

**ACC Surveillance Rating with Radar Endorsement**

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1	Students shall integrate system degradation procedures in the management of air traffic			
<b>1 Communication Equipment</b>				
1.-.1	Students shall ensure the transfer of data by alternative methods		Team Simul  <i>SIMUL REAL SIM ITMD</i>	
<b>1.1 Ground/Air Radio Equipment</b>				
1.1.1	Recognise that ground radio equipment has degraded	e.g. VHF, UHF, HF	1	Lesson  <i>Lesson RSTD MMC GTMD</i>
1.1.2	Provide information to aircraft using standby/backup equipment		4	Lesson  <i>Lesson RSTD MMC GTMD</i>  Team Simul  <i>SIMUL REAL SIM ITMD</i>



DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.2 Ground/Ground Equipment</b>				
1.2.1 Recognise that equipment has degraded	e.g. telephone, interphone, intercom	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	
1.2.2 Provide information to adjacent sectors by using standby/backup equipment		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.3 Data Link Equipment</b>				
1.3.1 Recognise data link equipment has degraded	e.g. Mode S, automatic data transfer, automatic co-ordination	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	
1.3.2 Use alternative methods of transferring data between ground and aircraft	e.g. ground/air radio	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
1.3.3 Use alternative methods of transferring data between units/work stations	e.g. telephone, direct pointing, intercom	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>2 Surveillance Equipment</b>				
2.-.1 Students shall respond to degradation of surveillance equipment			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
<b>2.1 Partial or Total Display Degradation</b>				
2.1.1 Recognise that surveillance equipment has degraded	Partial power failure, loss of certain facilities, total failure	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
2.1.2 Integrate remedial procedures and/or techniques	e.g. inform adjacent sectors, inform aircraft, apply vertical separation (emergency, increased), increased radar separation, reduce the number of aircraft entering area of responsibility, transfer aircraft to another unit	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>   Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>3 Processing Systems</b>				
3.-.1 Students shall respond to degradation in the processing systems associated with the surveillance equipment				
<b>3.1 ATC Processing System Degradation</b>				
3.1.1 Recognise a system degradation	e.g. FDPS, RDPS, software processing of surveillance display	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	
3.1.2 Integrate appropriate procedure following a processing system degradation	e.g. national procedures, local unit procedures	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>4 Navigation Equipment</b>				
4.-.1 Students shall respond to the degradation of non-surveillance navigation equipment			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>HI FI SIM</i> <i>ITMD</i>	
<b>4.1 Navigational Aid Degradation</b>				
4.1.1 Recognise when a navigational equipment failure will affect operational ability	e.g. VOR; approach aid	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>	
4.1.2 Integrate appropriate procedures in the event of a navigational equipment failure	e.g. vertical separation (standard, emergency), other non-radar separation (geographical, visual), inform aircraft, seek assistance from adjacent units	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>MMC</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

## 5. TRAINING PLANS FOR MODULE 8

### 5.1 Timescale

Table 4 is the Module 8 timetable.

This timetable is only to be understood as an **addition** to Module 7. Module 8 is not a stand-alone module. In fact, only Module 7 + Module 8 is meaningful.

Table 4: Module 8 - Terminal area control endorsement

	TOTAL	INTR	LAW	ATM	MET	NAV	ACFT	HUM	EQPM	PENV	UNIN	DEGS	AGA
CASE	4			2							2		
CBPE	0												
CBT	12			9	2		1						
Lesson	31	1	4	10		2	7				3	1	3
PTP	15			15									
SA	2					2							
STBF	7		1	6									
SIMUL	50			40								10	
Visit	0												
Other	0												
TOTAL	121	1	5	82	2	4	8	0	0	0	5	11	3

Table 5 is the global Module 7 + Module 8 timetable.

Table 5: Module 7 + 8 - ACC surveillance rating with radar and TMA endorsement

	TOTAL	INTR	LAW	ATM	MET	NAV	ACFT	HUM	EQPM	PENV	UNIN	DEG	AGA
CASE	16			5				2			9		
CBPE	3			2			1						
CBT	45			24	2	8	5	3		3			
Lesson	115	6	13	22		7	20	16	10	2	9	7	3
PTP	75			58			13		4				
SA	3					3							
STBF	14		2	12									
SIMUL	150			130								20	
Visit	23	2							5	16			
Other	12								7	5			
TOTAL	456	8	15	253	2	18	39	21	26	26	18	27	3

## 5.2 Training Requirements: Training Event Coverage

### 5.2.1 Introduction

Training Event Type	Title	Duration	Code
CASE CBPE CBT Lesson PTP SA STBF SIMUL Visit Other	Course Introduction	1	INTR LEC81
<b>Total</b>		1	

### 5.2.2 Aviation Law

Training Event Type	Title	Duration	Code
CASE CBPE CBT Lesson	Airspace Classification	1	LAW LES81
	VFR, IFR and General Rules	1	LAW LES82
	Holding Procedures	1	LAW LES83
	Licence and Rating	1	LAW LES84
PTP SA STBF	Airspace Types and Structures	1	LAW STBF81
SIMUL Visit Other			
<b>Total</b>		5	

**5.2.3 Air Traffic Management**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>	ATM communications	2	ATM CAS81
<b>CBPE</b>			
<b>CBT</b>	Limits of responsibility	5	ATM CBT81
	Radar Information	3	ATM CBT82
	Altimetry	1	ATM CBT83
<b>Lesson</b>	Limits of Responsibility	1	ATM LES81
	Communications	1	ATM LES82
	Analysis of Co-ordination	2	ATM LES83
	Operational Environment	1	ATM LES84
	Terminal Control	4	ATM LES85
	Terminal Control (holding)	1	ATM LES86
<b>PTP</b>	Area of Responsibility	5	ATM PTP81
	Radar Information	3	ATM PTP82
	Terrain Clearance	2	ATM PTP83
	Delegation of Separation	1	ATM PTP84
	Use of Data Display	4	ATM PTP85
<b>SA</b>			
<b>STBF</b>	Alerting Service	2	ATM STBF81
	Flow Management	1	ATM STBF82
	Operational Environment	1	ATM STBF83
	Interpretation of the Operational Information	1	ATM STBF84
	Landing Sequence	1	ATM STBF85
<b>SIMUL</b>		40	
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		82	

**5.2.4 Meteorology**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>	Air pressure	2	MET CBT81
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>			
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		2	

**5.2.5 Navigation**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>			
<b>CASE</b>	Applied Navigation	2	NAV LES81			
<b>CBPE</b>						
<b>CBT</b>						
<b>Lesson</b>						
<b>PTP</b>						
<b>SA</b>				Use of Maps and Charts	2	NAV SA81
<b>STBF</b>						
<b>SIMUL</b>						
<b>Visit</b>						
<b>Other</b>						
<b>Total</b>		4				



**5.2.6 Aircraft**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>	Performance Data	1	ACFT CBT81
<b>Lesson</b>	Ecological factors	2	ACFT LEC81
	Holding and Wake turbulence	1	ACFT LES81
	Climb	1	ACFT LES82
	Descent	1	ACFT LES83
	Final Approach and Landing	2	ACFT LES84
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		<b>8</b>	

**5.2.7 Human Factors**

No additional dedicated training event planned after Module 7.

**5.2.8 Equipment and Systems**

No additional dedicated training event planned after Module 7.

**5.2.9 Professional Environment**

No additional dedicated training event planned after Module 7.

**5.2.10 Unusual/Emergency Situations**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>	List of Unusual situations	2	UNIN CAS81
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Procedures for Unknown Traffic	2	UNIN LES 81
	Vectoring Out of Controlled Airspace	1	UNIN LES 82
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>			
<b>Visit</b>			
<b>Other</b>			
<b>Total</b>		5	

**5.2.11 Degraded Systems Capability**

<b>Training Event Type</b>	<b>Title</b>	<b>Duration</b>	<b>Code</b>
<b>CASE</b>			
<b>CBPE</b>			
<b>CBT</b>			
<b>Lesson</b>	Degraded situations	1	DEG LES 81
<b>PTP</b>			
<b>SA</b>			
<b>STBF</b>			
<b>SIMUL</b>		10	DEG SIM 81
<b>Visit</b>			
<b>Other</b>			DEG SIM 85
<b>Total</b>		11	

**5.2.12 Aerodromes**

Training Event Type	Title	Duration	Code
<b>CASE</b> <b>CBPE</b> <b>CBT</b> <b>Lesson</b> <b>PTP</b> <b>SA</b> <b>STBF</b> <b>SIMUL</b> <b>Visit</b> <b>Other</b>	Design and Layout of Aerodromes	3	AGA LEC 81
<b>Total</b>		3	

### 5.3 Training Requirements: Training Plans

In these Training Plans some objectives are not linked to a training event. This means that:

- either the 'parent' objective (general or main) is linked to a training event and this is considered sufficient to cover the 'child' objective (example: all the AGA objectives but the general),
- or the objective was addressed in basic training or in Module 7.

The tables figuring the training plans are divided in five columns, which include the data related to the objectives:

Objectives	Training Content	Level	Type of Training Event	Educational Material and References
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Table width rows are included to group the objectives by topics:

<b>Topics</b>
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The objectives below the row are related to the topic of the row:

<b>Topic 1</b>	
Objective 1.1	
<b>Topic 2</b>	
Objective 2.1	
<b>Topic 2.1</b>	
Objective 2.1.1	
Objective 2.1.2	

**Terminal Area Control Endorsement**

INTR	INTRODUCTION TO THE COURSE			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1	Students shall know and understand the training programme that they will follow during the institutional rating training		Lect.  <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>1 Course Management</b>				
1.-1	Students shall explain the aims and objectives of the course, the management structure and recognise the materials to be used		Lect.  <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>1.1 Course Introduction</b>				
1.1.1	Explain the aims and main objectives of the course	Course objectives for the specific rating/endorsement	2	
<b>1.2 Course Administration</b>				
1.2.1	Name the course leader and principal instructors		1	
<b>1.3 Study Material and Training Documentation</b>				
1.3.1	Choose appropriate documentation for course studies	Library, CBT library	3	
1.3.2	Integrate appropriate documentation into the course	Library, CBT library	4	

INTR	INTRODUCTION TO THE COURSE			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2 Introduction to the ATC Training Course</b>				
2.-.1 Students shall state the methodology and describe the assessment procedures used in the course			Lect.  <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>2.1 Course Content</b>				
2.1.1 State the different methods of teaching the subjects	Theoretical training, practical training, self-study, taxonomy, action verbs	1		
2.1.2 Describe, in general terms, the content of the subjects		2		
2.1.3 Describe the organisation of theoretical training		2		
2.1.4 Describe the organisation of simulation training	Structure of participation, simulation exercises, briefing, debriefing	2		
<b>2.2 Training Ethos</b>				
2.2.1 Recognise the feedback mechanisms available	Instructor discussions, training progress, assessment, results, briefing, debriefing	1		
2.2.2 Describe the positive effect in working together with fellow course participants	How the influence of interactive studies can lead to success	2		
<b>2.3 The Assessment Process</b>				
2.3.1 Describe the assessment procedure	The assessment process applied during the course and associated re-sit procedures	2		

**Terminal Area Control Endorsement**

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.-.1 Students shall: <ul style="list-style-type: none"> <li>i. appreciate the principles of aviation law;</li> <li>ii. know, understand and apply the Rules of the Air and the Regulations, including airspace and flight planning;</li> <li>iii. appreciate the authority vested in the controller and the means by which that authority is exercised</li> </ul>				
<b>1 Rules and Regulations</b>				
1.-.1 Students shall explain and apply the rules and regulation which affect ATC operations				
<b>1.1 General</b>				
1.1.1 Differentiate between the Air Navigation Services	ICAO Doc 9161- ATM (ATS, ATFM, ASM)	2		
1.1.2 Explain the considerations which determine the need for the Air Traffic Services (ATS)	ICAO Annex 11 Chapter 2	2		
1.1.3 Differentiate between the ATS	ATC service, advisory service, FIS, alerting service	2		

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.2 Reports</b>				
1.2.1 State the standard forms for reports	e.g. incident/accident, airmis/airprox, breach of regulations, watch/log book, records	1		
1.2.2 Describe the functions of, and processes for, reporting	e.g. incident/accident, airmis/airprox, breach of regulations, watch/log book, records	2		
1.2.3 Use the standard forms for reporting	ICAO Doc 4444 Appendix 4	3		
1.2.4 Explain the use of air traffic incident/accident report form	ICAO Doc 4444 Part 2, national regulations	2		
1.2.5 Use the ICAO air traffic incident/accident report form	ICAO Doc 4444	3		
1.2.6 Use the national air traffic incident/accident report form		3		
<b>1.3 Airspace</b>				
1.3.1 Appreciate types of airspace and their relevance to APS/RAD/TC or ACS/RAD/TC control	Classes A-G as appropriate, national classifications	3	Lesson  <i>Lesson RSTD AV GTMD</i>	



LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.3.2 Provide planning, co-ordination and control actions appropriate to the airspace classification	ICAO Annex 11, national requirements (AIP), international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, airspace structure Link to ATM 1.4.2. NOTE: the simulated environment must be related to the specific rating and take account of the local airspace classification requirements	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>   PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
1.3.3 Appreciate the structure of airspace and its relevance to the APS/RAD/TC or ACS/RAD/TC endorsement	ICAO Annex 11, national requirements (AIP), international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, airspace structure	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.3.4 Provide planning, co-ordination and control actions appropriate to the airspace structure	ICAO Annex 11, national requirements (AIP), international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, airspace structure NOTE: the simulated environment must be related to the specific rating and take account of the local airspace classification requirements	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>1.4 Rules of the Air</b>				
1.4.1 Provide planning, co-ordination and control actions appropriate to the General Rules	ICAO Annex 2, ICAO Annex 11, Chapter 3 NOTE: the simulated environment must be related to the specific rating and take account of the appropriate rules	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.4.2 Provide planning, co-ordination and control actions appropriate to the VFR, IFR, and meteorological flying conditions	ICAO Annex 2, ICAO Annex 11. Chapters 4 and 5 NOTE: the simulated environment must be related to the specific rating and take account of the appropriate rules	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
1.4.3 Provide planning, co-ordination and control actions appropriate to the rules for minimum safe height and terrain clearance	Responsibility for terrain clearance, terrain clearance dimensions, minimum safe altitudes, safe sectors, transition level, minimum flight level	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>1.5 Flight Plans</b>				
1.5.1 Obtain flight plan information in order to provide Air Traffic Services (ATS)	Types of FPL (RPL, AFIL, etc.), supplementary information	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

<b>LAW</b>	<b>AVIATION LAW</b>			
<b>Objectives</b>	<b>Training Content</b>	<b>L</b>	<b>Type of Training Event</b>	<b>Educational Material and References</b>
L = Level				
1.5.2 Use flight plan information in order to provide ATS	Types of FPL (RPL, AFIL, etc.), supplementary information	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.5.3 Appreciate the pilot's responsibilities in relation to adherence to flight plan	Inadvertent changes, intended changes, position reporting	3		
<b>1.6 National Legislation and Procedures</b>				
1.6.1 Describe the methods by which national regulations are implemented in the APS/RAD/TC or ACS/RAD/TC endorsement		2		
<b>1.7 Special National Legislation and Procedures</b>				
1.7.1 Provide planning, co-ordination and control actions in accordance with special national legislation and procedures	e.g. security, environmental (noise abatement, conservation areas, fuel jettisoning), sensitive areas (hospitals, VIP residences), priority allocation, special purpose codes			
<b>2 Holding</b>				
2.-.1 Students shall describe holding patterns and procedures				

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.1 Holding IFR</b>				
2.1.1 Describe types of holding patterns	Published, non-published, extended Link to ATM 10	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.1.2 Describe an ICAO holding pattern	ICAO Doc 8168 - parts of an IFR holding pattern, entry/exit procedures, dimensions of patterns, protected airspace, holding areas, alignment, rates of turns, holding times, expect further clearance, Expected Approach Times (EATs) Link to ATM 7.10	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
2.1.3 Describe the use and purpose of holding	Effect of speed, effect of level used, effect of navigation aid in use Link to ATM 7.10	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
<b>2.2 Holding VFR</b>				
2.2.1 Describe the purpose and principles of VFR holding		2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

LAW	AVIATION LAW			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>3 ATC Licensing</b>				
3.-.1 Students shall appreciate the legal aspects associated with the ATC Licence ('European Manual of Personnel Licensing – Air Traffic Controllers') [EATMP, 2000c])			Lesson <i>Lesson RSTD AV GTMD</i>	
<b>3.1 Privileges and conditions</b>				
3.1.1 Describe the conditions which must be met for the issue and maintenance of the APS/RAD/TC or ACS/RAD/TC rating		2	Lesson <i>Lesson RSTD AV GTMD</i>	'European Manual of Personnel Licensing - Air Traffic Controllers' [EATMP, 2000c])
3.1.2 Describe the privileges associated with the APS/RAD/TC or ACS/RAD/TC rating		2	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>3.2 Incident/Accident</b>				
3.2.1 Explain the procedures used following an incident/accident	National regulations	2		

**Terminal Area Control Endorsement**

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1 Students shall apply operational procedures to ensure a safe, orderly and expeditious service				
<b>1 Air Traffic Services and Airspace Management</b>				
1.-.1 Students shall provide the appropriate service			Team Simul  <i>SIMUL REAL SIM ITMD</i>	
<b>1.1 Air Traffic Control Services</b>				
1.1.1 Provide the appropriate air traffic control services	ICAO Annex 11, ICAO Doc 7030, ICAO Annex 11, ICAO Doc 4444, national docs, operation manuals	4	Lesson  <i>Lesson RSTD AV GTMD</i>  CBT  <i>Inter Self MMC ITMD</i>	
1.1.2 Appreciate own area of responsibility	NOTE: the simulated environment must be related to the specific rating	3	Lesson  <i>Lesson RSTD AV GTMD</i>  PTP  <i>Pre Simul RSTD PTT ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			CBT  <i>Inter Self MMC ITMD</i>	
<b>1.2 Flight Information Service (FIS)</b>				
1.2.1 Explain the responsibility for the provision of a FIS	ICAO Doc 4444, Part 2	2		
1.2.2 Relay appropriate information concerning the location of other conflicting traffic	Traffic information, essential traffic information	3		
1.2.3 Provide FIS	ICAO Doc 4444	4		
1.2.4 Use radar for the provision of FIS	ICAO Doc 4444, information to identified aircraft concerning: traffic, weather, navigation	3	CBT  <i>Inter Self MMC ITMD</i>  PTP  <i>Pre Simul RSTD PTT ITMD</i>	
<b>1.3 Alerting Service</b>				
1.3.1 Explain the responsibility for the provision of an alerting service	ICAO Annex 11	2	STBF  <i>Brief RSTD VIS GTMD</i>	



ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.3.2 Provide appropriate action in abnormal situations	ICAO Doc 4444 special codes, seek assistance (TRM), checklist, national legislation/requirements, overdue action, emergency action, uncertainty, alert, distress	4	STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
1.3.3 Respond to distress and urgency messages and signals		3	STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
1.3.4 Apply national requirements in abnormal situations	Priority allocation, special purpose codes	3		
1.3.5 Co-ordinate with RCC		4		
1.3.6 Provide appropriate action in abnormal situations using radar derived information		4		
<b>1.4 Air Traffic Flow Management (ATFM)</b>				
1.4.1 Apply principles of ATFM	Working principles of ATFM, flexible use of airspace, free flight	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.4.2 Organise traffic flows and patterns to take account of airspace boundaries	Civil & military, controlled, uncontrolled, advisory, restricted, danger, prohibited, special rules, sector boundaries, national boundaries, FIR boundaries, delegated airspace, transfer of control, transfer of communications, en-route, off route Link to Aviation Law 1.3	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.4.3 Organise traffic flows and patterns to take account of radar coverage		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.4.4 Organise traffic flows and patterns to take account of areas of responsibility	TMA	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.4.5 Balance demand against capacity	Capacity of adjacent sectors, capacity of own sector, evaluation of personal traffic load, evaluation of other sources of predicted traffic load	5	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.4.6 Inform supervisor of situation	e.g. abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, relevant information (e.g. reported ground-based incidents, forest fire, smoke, oil pollution), unusual meteorological conditions	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.4.7 Apply flow management procedures		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1.5    Airspace Management (ASM)</b>				
1.5.1 Appreciate the working principle of ASM	FUA	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.5.2 Organise traffic to take account of ASM	Conditional routes	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

<b>2 Communication</b>				
2.-.1	Students shall appreciate the necessity for effective communication and use approved phraseology			
<b>2.1 Effective Communication</b>				
2.1.1	Analyse examples of pilot and controller communication for effectiveness		4	
2.1.2	Explain the need for approved phraseology	ICAO Doc 4444, Part 10, ICAO Doc 9432, standards words and phrases as contained in ICAO Annex 10 chapter 5	2	
2.1.3	Use ICAO-approved phraseology	ICAO Doc 4444, Part 10, ICAO Doc 9432, standards words and phrases as contained in ICAO Annex 10 chapter 5	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>
2.1.4	Use national approved phraseology when applicable		3	
2.1.5	Perform communication effectively	Transmission techniques	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.2 Phraseology for Unusual Events</b>				
2.2.1 Analyse examples of pilot and controller communication for effectiveness		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Cases  <i>Cases</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	
2.2.2 Interpret the rules to provide an effective service where approved phraseology is not available	Receiver (RX) only, transmitter (TX) only, speechless aircraft, incomplete messages	5	Cases  <i>Cases</i> <i>RSTD</i> <i>MMC</i> <i>ITMD</i>	
<b>2.3 Mode S Data Transfer</b>				
2.3.1 Appreciate the use of Mode S	Data which can be exchanged, limitations, advantages, disadvantages	3		
<b>3 ATC Clearances and Instructions</b>				
3.-.1 Students shall issue appropriate ATC clearances and instructions				
<b>3.1 ATC Clearances</b>				
3.1.1 Provide appropriate ATC clearances	e.g. climb, joining, en-route	4		
<b>3.2 ATC Instructions</b>				
3.2.1 Provide appropriate ATC instructions	e.g. SSR Code	4		

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>4 Co-ordination</b>				
4.-.1 Students shall understand the need for, and conduct co-ordination				
<b>4.1 Necessity</b>				
4.1.1 Identify the need for co-ordination		3		
<b>4.2 Tools &amp; Methods</b>				
4.2.1 Use the available tools for co-ordination methods	e.g. electronic transfer of light data, telephone, interphone, intercom, direct speech, radio telephone, local agreements	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>4.3 Co-ordination Procedures</b>				
4.3.1 Initiate appropriate co-ordination	Delegation/transfer of responsibility for air/ground communications and separation, transfer of control	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
4.3.2 Analyse effect of co-ordination requested by an adjacent operational position	Delegation/transfer of responsibility for air/ground communications and separation, transfer of control	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
4.3.3 Select, after negotiation, an appropriate course of action	Including the cases: when additional traffic cannot be accepted by adjacent control position, when additional traffic cannot be accepted by own control position	5	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
4.3.4 Ensure that the agreed course of action is carried out		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>5 Altimetry and Level Allocation</b>				
5.-.1 Students shall allocate appropriate levels to aircraft				
<b>5.1 Altimetry</b>				
5.1.1 Calculate appropriate levels	e.g. TRL, TA, transition layer, height, flight level, altitude, vertical distance to airspace boundaries	3	CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
5.1.2 Allocate levels (height, altitude, flight level) according to altimetry data		4	CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
5.1.3 Ensure separations according to altimetry data	e.g. TRL, TA, transition layer, height, flight level, altitude, vertical distance to airspace boundaries	4	CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

**5.2 Terrain Clearance**

5.2.1 Integrate safe vertical distance from terrain into control actions	e.g. lowest available flight level, minimum safe altitude, Minimum Sector Altitude (MSA)	4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
5.2.2 Ensure safe vertical distance from terrain	e.g. radar vectoring area, lowest available flight level, minimum safe altitude, Minimum Sector Altitude (MSA)	4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

**6 Separation Standards**

6.-.1 Students shall select and maintain appropriate separation between aircraft				
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**6.1 Radar Separation**

6.1.1 Describe how radar separation is applied	On an analogue radar display, on a synthetic radar display, between primary radar blips, between secondary radar responses, primary vs., secondary Radar Position Symbols (RPS)	2		
6.1.2 Provide radar separation	ICAO Doc 4444, ICAO Doc 7030, standard, increased, reduced, emergency separations, speed control	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	



ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
6.1.3 Provide radar separation by practising radar vectoring in a variety of situations	Transit, meteorological phenomena, vectoring for approach, departure vs. transit vs. arrival	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>6.2 Vertical Separation</b>				
6.2.1 Provide standard vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
6.2.2 Provide increased vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
6.2.3 Provide reduced vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
6.2.4 Provide emergency vertical separation	ICAO Doc 4444, ICAO Doc 7030, level allocation, during climb/descent, rate of climb/descent	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
6.2.5 Provide vertical separation in a radar environment	Into/out of radar cover, radar failure, Mode C derived information	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>6.3 Horizontal Separation</b>				
6.3.1 Provide longitudinal separation in a radar environment	Within radar coverage: speed control, mach number speed control	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>6.4 Delegation of Separation</b>				
6.4.1 Delegate separation in the case of aircraft continuing visually		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
6.4.2 Delegate separation to pilots in the case of VMC climb/descent		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
<b>6.5 Wake Turbulence Separation</b>				
6.5.1 Provide wake turbulence separation		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>7 Data Display</b>				
7.-.1 Students shall analyse data in order to manage air traffic				
<b>7.1 Data Management</b>				
7.1.1 Update the data display to accurately reflect the traffic situation	Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs	3	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
7.1.2 Analyse pertinent data on data displays		4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	
7.1.3 Organise pertinent data on data displays		4	PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>8 Operational Environment</b>				
8.-.1 Students shall recognise and maintain the integrity of the simulated operational environment			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>8.1 Integrity of the Operational Environment</b>				
8.1.1 Obtain information concerning the operational environment	e.g. briefing, take-over, notices, local orders, verify information	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
8.1.2 Check and maintain the integrity of the operational environment	e.g. integrity of displays, verify the information provided by displays	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
8.1.3 Inform the relieving controller of the operational environment	e.g. briefing, take-over, notices, local orders, verify information	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
<b>8.2 Verification of the Currency of Operational Procedures</b>				
8.2.1 Check all relevant documentation before managing traffic	e.g. briefing, LOAs, NOTAM, AIC	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
8.2.2 Apply procedural changes while managing traffic		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>9 Provision of Control Service</b>				
9.-.1 Students shall provide an appropriate control service, applicable to the specific rating - viz Terminal Area Control Endorsement			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>9.1 General</b>				
9.1.1 Describe the division of responsibility between air traffic control units	ICAO Doc 4444, national requirements	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
9.1.2 Describe the responsibility in regard to military traffic	ICAO Doc 4444, national requirements	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  PTP  <i>Pre Simul</i> <i>RSTD</i> <i>PTT</i> <i>ITMD</i>  CBT  <i>Inter</i> <i>Self</i> <i>MMC</i> <i>ITMD</i>	
9.1.3 Obtain operational information	ICAO Doc 4444, local operational manuals	3	Team Simul   <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
9.1.4 Interpret operational information		5	Team Simul   <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
			STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
9.1.5 Organise forwarding of operational information		4	STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
9.1.6 Integrate operational information into control decisions		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>  STBF  <i>Brief</i> <i>RSTD</i> <i>VIS</i> <i>GTMD</i>	
<b>9.2 Terminal Control</b>				
9.2.1 Explain the responsibility for the provision of a terminal radar control service	ICAO Doc 4444, local operational manuals	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
9.2.2 Explain the functions that can be performed with the use of radar derived information in a terminal radar control service	Holding, approach procedures, sequencing, calculation of EATs, missed approach procedures, departing traffic, overflying traffic	2	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

<b>10 Holding</b>				
10.-.1 Students shall manage holding traffic			Team Simul	
			<i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>10.1 Holding</b>				
10.1.1 Use holding patterns	ICAO Doc 4444, separation from holding patterns Link to Aviation Law 2	3	Team Simul	
			<i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.2 Issue holding instructions		3	Team Simul	
			<i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.3 Calculate expected onward clearance times		3	Team Simul	
			<i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.4 Consider the effect of: wind, aircraft speed, rate of turn, height, aircraft type, aircraft performance		2	Team Simul	
			<i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	



ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
10.1.5 Allocate holding levels		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.6 Provide vertical separation between aircraft in a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.7 Provide vertical separation between aircraft in a holding pattern and transiting aircraft		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.1.8 Provide separation between aircraft in a holding pattern and departing traffic		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
10.1.9 Update Expected Approach Times (EATs)		3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
10.1.10 Manage holding traffic on intermediate approach procedures		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
10.1.11 Organise the traffic landing sequence in a holding pattern	Change of sequence due to: company preference, aircraft approach capability (ILS categories)	4	Team Simul  <i>SIMUL REAL SIM ITMD</i>  STBF  <i>Brief RSTD VIS GTMD</i>	
<b>10.2 Holding in a Radar Environment</b>				
10.2.1 Provide vectors to aircraft entering a holding pattern		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
10.2.2 Ensure vertical separation exists before radar separation is lost		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
10.2.3 Provide vectors to transiting aircraft to ensure radar separation from a holding area		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
10.2.4 Provide vectors to aircraft leaving a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.2.5 Ensure re-identification of aircraft leaving a holding pattern		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
10.2.6 Maintain vertical separation until radar separation is established		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>11 Radar Identification</b>				
11.-.1 Students shall: i. establish and maintain radar identification; ii. respond to a loss of radar identification			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>11.1 Establishment of Radar Identification</b>				
11.1.1 Apply the methods of establishing radar identification using primary radar	ICAO Doc 4444	3		
11.1.2 Appreciate the precautions when establishing radar identification using primary radar		3		

ATM	<b>AIR TRAFFIC MANAGEMENT</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
11.1.3 Apply methods of establishing radar identification using secondary radar		3	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
11.1.4 Appreciate the precautions when establishing radar identification using secondary radar		3		
11.1.5 Apply procedures in the case of misidentification		3		
<b>11.2 Maintenance of Radar Identification</b>				
11.2.1 Appreciate the necessity to maintain radar identification at all times		3		
<b>11.3 Loss of Radar Identity</b>				
11.3.1 Recognise when an aircraft identification is lost or in doubt	e.g. out of radar coverage, loss of radar service, weather clutter, other clutter, garbling	1		
11.3.2 Apply methods to re-establish radar identification		3	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
11.3.3 Respond to loss/doubt concerning radar identification	Non-radar procedures	3		

ATM	AIR TRAFFIC MANAGEMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

<b>11.4 Position Information</b>				
11.4.1 Appreciate the circumstances when radar position information should be passed to the aircraft		3		
<b>11.5 Transfer of Identity</b>				
11.5.1 Apply the methods of transfer of radar identification		3		
11.5.2 Appreciate the precautions when transferring radar identification		3		

**Terminal Area Control Endorsement**

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.-.1 Students shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS to terminal traffic				
<b>1 Atmospheric Processes</b>				
1.-.1 Students shall calculate and integrate the minimum flight levels into their decision-making process				
<b>1.1 Air Pressure</b>				
1.1.1 Calculate the minimum applicable altitude/flight level being given appropriate meteorological data	Transition altitude, transition level, minimum flight level, transition layer Linked to ATM 5	3	CBT  <i>Inter Self MMC ITMD</i>	
<b>2 Meteorological Phenomena</b>				
2.-.1 Students shall analyse and take account of meteorological phenomena in their control actions				

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

**2.1 Planning and Co-ordination**

2.1.1 Analyse data about meteorological phenomena	Wind, cloud, precipitation, pressure settings, thunderstorms, icing, jetstreams, Clear Air Turbulence (CAT), turbulence, microburst, marked mountain waves, line squalls, solar radiation	4		
2.1.2 Integrate data into planning and co-ordination		4		

**2.2 Weather Avoidance**

2.2.1 Use radar vectoring techniques to avoid adverse weather when necessary/possible		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.2.2 Use radar vectoring techniques to avoid areas of radar clutter		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.3 Clearances and instructions</b>				
2.3.1 Analyse data about meteorological phenomena	Wind, cloud, precipitation, pressure settings, thunderstorms, icing, jetstreams, Clear Air Turbulence (CAT), turbulence, microburst, marked mountain waves, line squalls, solar radiation	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.3.2 Integrate data into clearances and instructions		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>2.4 Information</b>				
2.4.1 Obtain meteorological information	Wind, cloud, precipitation, pressure settings, thunderstorms, icing, jetstreams, Clear Air Turbulence (CAT), turbulence, microburst, marked mountain waves, line squalls, solar radiation	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.2 Relay meteorological information	To: aircraft, meteorological office, FIS	3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	



MET	METEOROLOGY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
2.4.3 Decode meteorological information		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.4 Analyse data about meteorological phenomena		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
2.4.5 Integrate data into transmitted information		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

**Terminal Area Control Endorsement**

NAV	NAVIGATION			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1	Students shall analyse all navigational aspects in order to organise the traffic			
<b>1 Applied Navigation</b>				
1.-.1	Students shall appreciate the information on maps and charts and integrate this into control decisions		Lesson <i>Lesson</i> RSTD AV GTMD  SA  <i>Pre Simul</i> Self OTD ITMD	
<b>1.1 Maps and Charts</b>				
1.1.1	Use maps and charts for planning and co-operation purposes	3	Team Simul  <i>SIMUL</i> REAL SIM ITMD  PTP  <i>Pre Simul</i> RSTD PTT ITMD	
<b>1.2 Pilot Interpreted Ground-based System</b>				
1.2.1	Estimate the behaviour for aircraft according to the operational status of navigational ground-based systems	3		Limitations of navigation aids, status of NAVAIDs

NAV	NAVIGATION			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.3 On-board Systems</b>				
1.3.1 Estimate the behaviour of aircraft according to the operational status of navigational on-board systems	Limitations of on-board navigation systems	3		
<b>1.4 Satellite-based Systems</b>				
1.4.1 Estimate the behaviour of aircraft according to the operational status of navigational satellite-based systems	GPS, GLONASS, GNSS	3		
<b>1.5 Future Developments</b>				
1.5.1 Be informed about existing projects and developments which will impact on the work in the future	e.g. briefing, seminars, courses, workshops, technical journals, aviation journals	0		
<b>1.6 Navigational Assistance</b>				
1.6.1 Evaluate the necessary information to be provided to pilots in need of navigational assistance	Nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other navigational assistance relevant at the time	5	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.6.2 Assist aircraft observed to be deviating from its known intended route		3	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

**Terminal Area Control Endorsement**

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1 Students shall assess aircraft performance to integrate it into traffic organisation				
<b>1 Aircraft Instruments</b>				
1.-1 Students shall understand the relevance of the cockpit information presented to the pilot				
<b>1.1 Cockpit Instruments</b>				
1.1.1 Integrate the information provided by the pilot into the traffic situation	Flight instruments; Engine instruments; Navigational instruments; NDB (ADF); VOR (TACAN); DME; ILS; MLS; Additional instruments; TCAS; SSR transponder; Head up display; GPWS; Wind shear indicator; Weather radar; FMS; EFIS	4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
<b>2 Aircraft Types and Categories</b>				
2.-1 Students shall characterise wake turbulence and ICAO approach categories				
<b>2.1 Wake Turbulence Categories</b>				
2.1.1 Characterise each wake turbulence category and explain how to prevent their effect on other aircraft		2	Lesson  <i>Lesson RSTD AV GTMD</i>	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.2 ICAO Approach Categories</b>				
2.2.1 Characterise each ICAO approach category and explain why procedures are established accordingly		2		
<b>2.3 Planning</b>				
2.3.1 Consider aircraft categories for planning purposes	Categories A, B, C, D, E	2		
<b>3 Factors Affecting Aircraft Performance</b>				
3.-.1 Students shall integrate aircraft performance factors in the provision of terminal control			CBT  <i>Inter Self MMC ITMD</i>	
<b>3.1 Climb</b>				
3.1.1 Integrate the effect of factors affecting aircraft during climb into the analysis of traffic situations		4	Lesson  <i>Lesson RSTD AV GTMD</i>	
<b>3.2 Descent and Initial Approach</b>				
3.2.1 Integrate the effect of factors affecting aircraft during descent and initial approach into the analysis of traffic situations		4	Lesson  <i>Lesson RSTD AV GTMD</i>	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

**3.3 Final Approach and Landing**

3.3.1 Estimate the influence of factors affecting aircraft during final approach and descent	Aircraft configuration, weight, meteorological conditions, runway conditions	3	Lesson  <i>Lesson RSTD AV GTMD</i>	
3.3.2 Integrate the influence of factors affecting aircraft during final approach and descent in the management of the traffic		4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	

**3.4 Economic Factors**

3.4.1 Integrate consideration of economic factors into control actions	Routing, flight level, speed, rates of climb or descent	4	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
3.4.2 Use continuous climb techniques where applicable		3	Team Simul  <i>SIMUL REAL SIM ITMD</i>	
3.4.3 Use direct routing where applicable		3	Team Simul  <i>SIMUL REAL SIM ITMD</i>	

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

**3.5 Ecological Factors**

3.5.1 Integrate ecological restrictions into traffic planning and control action	Fuel dumping, noise abatement procedures, minimum flight levels	3	Lect.  <i>LECT.</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
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**3.6 Miscellaneous Factors**

3.6.1 Integrate operational requirements into planning	e.g. military flying, calibration flights, aerial photography	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
3.6.2 Explain the affect of antenna shadowing on RTF communications		2		
3.6.3 Explain the affect of antenna shadowing on SSR operation		2		
3.6.4 Integrate factors effecting aircraft into planning	Message relays regarding performance	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
3.6.5 Explain the operation of aircraft additional equipment	Radios (number of), emergency radios, SELCAL	2		
3.6.6 Explain the operation of aircraft additional equipment	Oxygen masks, pressurisation, noise interference	2		

ACFT	AIRCRAFT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
3.6.7 Explain the operation of aircraft additional equipment	Transponders, Mode A, Mode C, Mode S	2		
<b>4 Aircraft Data</b>				
4.-.1 Students shall: i. use the standard average performance data for the provision of TMA control; ii. recognise potential or actual emergency situations; iii. apply standard solutions in the case of simple situations				
<b>4.1 Performance Data</b>				
4.1.1 Integrate the know aircraft performance data into control action decisions	Rate of climb/descent, cruising speed, ceiling	4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	



**Terminal Area Control Endorsement**

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1 Students shall: i. recognise the necessity to constantly extend their knowledge; ii. analyse factors which affect personal and team performance				
<b>1 Psychological Factors</b>				
1.-.1 Students shall relate psychological factors to the decision-making process				
<b>1.1 Cognitive</b>				
1.1.1 Describe the factors which influence decision-making	e.g. stress, learning, knowledge, fatigue, alcohol/drugs, distraction, interpersonal relations, TRM	2		
1.1.2 Relate human factors to decision-making		4		
<b>2 Medical and Physiological Factors</b>				
2.-.1 Students shall respond to fatigue and lack of personal fitness in the performance of their duties				
<b>2.1 Fatigue</b>				
2.1.1 Describe the onset of fatigue	e.g. lack of concentration, listlessness, irritability, frustration	2		

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
2.1.2	Recognise the onset of fatigue in self	3		
2.1.3	Recognise the onset of fatigue in others	3		
2.1.4	Respond to indications of fatigue in an appropriate manner	3		
<b>2.2 Fitness</b>				
2.2.1	Recognise signs of lack of personal fitness	2		
2.2.2	Describe actions when aware of a lack of personal fitness	2		
<b>3 Social and Organisational Factors</b>				
3.-.1	Students shall develop teamworking attitudes			
<b>3.1 Human Relations</b>				
3.1.1	Apply social and organisational factors to work with other team members	3		
<b>3.2 Team Resource Management (TRM)</b>				
3.2.1	State the objectives of TRM	1		'Guidelines for Developing and Implementing Team Resource Management' (EATCHIP, 1996a)
<b>3.3 Group Dynamics</b>				
3.3.1	Identify the professional relationships between members of the group	3		
3.3.2	Identify the reasons for conflict	3		

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
3.3.3 Describe actions to prevent repetitions		2		
3.3.4 Take account of TRM programmes	TRM, CISM	2		
3.3.5 Respond to the application of TRM techniques	Role of members, allocation of responsibilities within the team, benefits of having other team members to rely on, safety aspects, assistance in abnormal situations	3		
<b>4 Communication</b>				
4.-.1 Students shall: i. accurately complete written reports; ii. express themselves clearly so as to be understood by other team members and colleagues				
<b>4.1 Written Work</b>				
4.1.1 Record information by writing effectively	e.g. strips, reports, log-books	3		
4.1.2 Pass information by writing effectively		3		
<b>4.2 Verbal/Non-verbal communication</b>				
4.2.1 Recognise human communication theory	e.g. different languages, air traffic language	1		
4.2.2 Characterise the factors which affect verbal communication	e.g. speed of speech, frequency, volume, background noise	2		

HUM	HUMAN FACTORS				
Objectives	Training Content	L	Type of Training Event	Educational Material and References	
L = Level					
4.2.3	Characterise non-verbal communication	e.g. body language, facial expressions	2		
4.2.4	Use language effectively in the practice of air traffic control		3		
<b>5 Stress</b>					
5.-.1	Students shall integrate stress management procedures in the performance of their duties				
<b>5.1 Stress</b>					
5.1.1	Recognise the effects of stress	Stress and its symptoms in self and in others	1		
<b>5.2 Helplessness</b>					
5.2.1	Respond to feelings of helplessness	Normal/abnormal situations	3		
<b>5.3 Stress Management</b>					
5.3.1	Act to relieve or minimise stress in self and/or others	The effect of personality in coping with stress, the benefits of active stress management	3		
5.3.2	Obtain assistance in stressful situations	TRM, CISM, the benefits of offering and accepting help in stress situations	3		
5.3.3	Recognise the effect of shocking and stressful events	Self and others, abnormal situations, CISM, TRM	1		

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
5.3.4 Consider the benefits of Critical Incident Stress Management (CISM)		2		
5.3.5 Explain the procedures used following and incident/accident	CISM, national/local procedures and/or regulations, counselling, human element	2		
<b>6 Human Error</b>				
6.-.1 The student shall be able to discuss the concept of human error				
<b>6.1 Human Error</b>				
6.1.1 Explain the relationship between error and safety	Number and combination of errors, pro-active versus reactive approach to discovery of error	2		
6.1.2 State the different types of error	Slips, lapses, mistakes, violations	1		
6.1.3 Differentiate between errors and violations		2		
6.1.4 Describe error-prone conditions		2		
<b>7 Working Methods</b>				
7.-.1 Students shall discuss the effect of human factor's considerations on efficiency				

HUM	HUMAN FACTORS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>7.1 Efficiency</b>				
7.1.1 Consider, from a human factors point of view, the factors effecting efficiency in the provision of air traffic control	Own workload, adjacent sector workload, OJT, customer requirements, economy, ecology, safety	2		
<b>8 Working Knowledge</b>				
8.-.1 Students shall explain the importance of maintaining and updating professional knowledge for controllers				
<b>8.1 Controller Knowledge</b>				
8.1.1 Maintain and update professional knowledge to retain competence in the operational environment	e.g. briefing, LOAs, NOTAM, AICs, reports of accident/incident, VOLMET, ATIS, SIGMET	3		

**Terminal Area Control Endorsement**

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
--.1 Students shall: i. demonstrate knowledge and understanding of the basic working principles of equipment that is in general use in ATC; ii. select and operate the appropriate equipment in order to provide a safe and efficient ATC service in a simulated environment				
<b>1 General</b>				
1.-.1 Students shall be familiar with typical equipment to be found in a control environment				
<b>1.1 ATC Equipment</b>				
1.1.1 Maintain the technical integrity of the operational position	Notification procedures, responsibilities	3		
1.1.2 Operate the various items of equipment in the simulator	Electronic displays, flight progress board (strip display), meaning of colours	3		
1.1.3 Operate all available equipment in abnormal situations		3		
<b>1.2 Controller Knowledge</b>				
1.2.1 Explain the importance of maintaining professional knowledge concerning new equipment		2		

EQPM	<b>EQUIPMENT AND SYSTEMS</b>			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.2.2 List the available means to maintain professional knowledge	e.g. briefing, seminars, courses, workshops, technical journals, aviation journals, familiarisation flights	1		
<b>2 Radio</b>				
2.-.1 Students shall correctly operate the radio and direction finding				
<b>2.1 Radio Theory</b>				
2.1.1 Consider radio range	Transfer to another frequency, apparent radio failure, failure to get radio contact	2		
<b>2.2 Radio Communications</b>				
2.2.1 Operate two-way communication	Equipment, procedures, frequency selection, all available equipment in abnormal situations	3		
2.2.2 Check for indications of correct operation of radio equipment	Indicator lights, serviceability displays, selector/frequency displays	3		
2.2.3 Check for faulty operation of radio equipment	Indicator lights, serviceability displays, selector/frequency displays	3		
2.2.4 Initiate corrective action when faulty operation is detected	In accordance with local instructions and procedures	3		



EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>2.3 Direction Finding</b>				
2.3.1 Measure and decode direction finding information	e.g. ADF/UDF/VDF, QDM, QDR, QTE	3		
2.3.2 Use direction finding information to assist in managing a safe orderly and expeditious flow of traffic	ADF/UDF/VDF	3		
<b>3 Other Voice Communications</b>				
3.-.1 Students shall operate the communication equipment				
<b>3.1 ATC Communications</b>				
3.1.1 Use telephone, interphone and intercom	In accordance with local instructions and procedures	3		
<b>4 Radar</b>				
4.-.1 Students shall use the radar equipment				
<b>4.1 Use of Radars</b>				
4.1.1 Operate radar equipment	Switch on an adjust settings in accordance with local instructions	4		
4.1.2 Operate appropriate anti-clutter devices	In accordance with local instructions, weather clutter, permanent echoes, unwanted targets	3		
4.1.3 Analyse the information provided by the radar equipment	Including: use, advantages, limitations	4		

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>4.2 Secondary Radar</b>				
4.2.1 Explain code management	Normal codes, specials codes, international, national, local	2		
4.2.2 Allocate codes		4		
<b>5 Future Equipment</b>				
5.-.1 Students shall be aware of known future developments				
<b>5.1 New Developments</b>				
5.1.1 Be aware of future developments	Voice recognition, Mode S	0		
<b>6 Automation in ATS</b>				
6.-.1 Students shall extract appropriate information from automated data				
<b>6.1 Aeronautical Fixed Telecommunications Network (AFTN)</b>				
6.1.1 Identify and decode the information disseminated through AFTN	Aircraft movement messages, NOTAM, SNOWTAM, BIRDTAM	3		
<b>6.2 On-Line Data Interchange (OLDI)</b>				
6.2.1 Operate electronic data transfer equipment		3		
<b>7 Operational Positions</b>				
7.-.1 Students shall identify, interpret and operate the equipment				

EQPM	EQUIPMENT AND SYSTEMS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>7.1 General</b>				
7.1.1 Use equipment in a TMA operational position		3		
<b>7.2 Information Systems</b>				
7.2.1 Check availability of information material		3		
<b>7.3 Flight Data Systems</b>				
7.3.1 Integrate the flight data displays at operational positions	Working principles, duties, equipment in use	4		
<b>8 Systems Limitations</b>				
8.-.1 Students shall understand the significance of system limitations				
<b>8.1 System and Equipment Limitations</b>				
8.1.1 Take account of the limitations of systems and equipment		2		

**Terminal Area Control Endorsement**

PENV	PROFESSIONAL ENVIRONMENT			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1	Students shall appreciate the need for close co-operation with other agencies			
<b>1 Study Visits and Customer Relations</b>				
1.-.1	When available, students shall participate in programmes to enhance their knowledge and understanding of ATC			
<b>1.1 Flight Familiarisation and/or Flight Simulator</b>				
1.1.1	Enhance knowledge of the ATC users operation by participating in familiarisation flights and flight simulator programmes	3		
<b>1.2 Other Units</b>				
1.2.1	Characterise other civil and military facilities	2		Study visits to: e.g. TWR, APP, ACC, AIS, RCC, air defence units
<b>1.3 Customer Relations</b>				
1.3.1	Appreciate the role of ATC as a service provider	3		
1.3.2	Appreciate the requirements of the users	3		e.g. civil and military operators, business users, recreational aviation operators, airport authorities

**Terminal Area Control Endorsement**

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.-.1 Students shall manage air traffic in unusual situations			Team Simul	
<b>1 Unusual/Emergency Situations</b>				
<b>1.1 Aircraft Problems</b>				
1.1.1 List of aircraft failures	e.g. engine failure, hydraulic failure, fire on board, lack of fuel, bird strike, transponder failure, decompression, ACFT lost/unsure of position	1	Cases <i>Cases RSTD TXT GTMD</i>	
1.1.2 Apply the recommended ATC procedures for given unusual situations		3	Cases <i>Cases RSTD TXT GTMD</i>	
<b>1.2 Unknown Traffic</b>				
1.2.1 Apply the procedures in the case of unknown traffic	Inside controlled airspace, outside controlled airspace, IFR/VFR	3	Lesson <i>Lesson RSTD AV GTMD</i>	
<b>1.3 Radar Vectoring Outside Controlled Airspace</b>				
1.3.1 Explain the circumstances which may require aircraft to be vectored out of controlled airspace	Weather avoidance, emergency, traffic avoidance	2	Lesson <i>Lesson RSTD AV GTMD</i>	
1.3.2 Apply procedures regarding vectoring out of controlled airspace	e.g. co-ordination, information to aircraft	1		

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.4 Transponder Failure</b>				
1.4.1 Apply procedures in the event of a SSR transponder failure	e.g. total, partial, national regulations, ICAO Doc 4444, ICAO Doc 7030	3		
<b>1.5 Radio Failure</b>				
1.5.1 Apply procedures when a controller experiences complete or partial failure of ground radio communication equipment		3		
1.5.2 Explain the procedures followed by a pilot when he experiences complete or partial radio failure	e.g. civil, military, special national procedures	2		
1.5.3 Apply ATC procedures associated with a pilot experiencing complete or partial radio failure	e.g. civil, military, special national procedures	3		
<b>1.6 Diversions</b>				
1.6.1 Provide flight information to diverting aircraft	e.g. nearest most suitable aerodrome, aerodrome information	4		
1.6.2 Provide flight information to other aircraft	e.g. concerning an emergency descent	4		
1.6.3 Perform appropriate co-ordination	e.g. other sectors and units	3		
1.6.4 Provide navigational assistance to diverting aircraft	Track/heading, distance, other navigational assistance	4		
1.6.5 Provide radar vectoring to diverting aircraft	Track/heading, distance	4		

UNIN	UNUSUAL/EMERGENCY SITUATIONS			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.7 Hijack</b>				
1.7.1 Apply ATC procedures associated with hijack	National, international	3		

**Terminal Area Control Endorsement**

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
-.1	Students shall integrate system degradation procedures in the management of air traffic			
<b>1 Communication Equipment</b>				
1.-.1	Students shall ensure the transfer of data by alternative methods			
<b>1.1 Ground/Air Radio Equipment</b>				
1.1.1	Recognise that ground radio equipment has degraded	e.g. VHF, UHF, HF	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>
1.1.2	Provide information to aircraft using standby/backup equipment		4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>
<b>1.2 Ground/Ground Equipment</b>				
1.2.1	Recognise that equipment has degraded	e.g. telephone, interphone, intercom	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>
1.2.2	Provide information to adjacent sectors by using standby/backup equipment		4	Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>



DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.3 Data Link Equipment</b>				
1.3.1 Recognise data link equipment has degraded	e.g. Mode S, automatic data transfer, automatic data transfer, automatic co-ordination	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
1.3.2 Use alternative methods of transferring data between ground and aircraft	e.g. ground/air radio	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
1.3.3 Use alternative methods of transferring data between units/work stations	e.g. telephone, direct pointing, intercom	3	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>1 Surveillance Equipment</b>				
1.-.1 Students shall respond to degradation of surveillance equipment			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
<b>1.1 Partial or Total Display Degradation</b>				
1.1.1 Recognise that surveillance equipment has degraded	Partial power failure, loss of certain facilities, total failure	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
1.1.2 Integrate remedial procedures and/or techniques	e.g. inform adjacent sectors, inform aircraft, apply vertical separation, emergency, increased radar separation, reduce the number of aircraft entering area of responsibility, transfer aircraft to another unit	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>2 Processing Systems</b>				
2.-.1 Students shall respond to degradation in the processing systems associated with the surveillance equipment				
<b>2.1 ATC Processing System Degradation</b>				
2.1.1 Recognise a system degradation	e.g. FDPS, RDPS, software processing of surveillance display	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

DEGS	DEGRADED SYSTEMS CAPABILITY			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
2.1.2 Integrate appropriate procedure following a processing system degradation	e.g. national procedures, local unit procedures	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>  Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>3 Navigation Equipment</b>				
3.-.1 Students shall respond to the degradation of non-surveillance navigation equipment			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	
<b>3.1 Navigational Aid Degradation</b>				
3.1.1 Recognise when a navigational equipment failure will effect operational ability	e.g. VOR, approach aid, navigational aids	1	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	
3.1.2 Integrate appropriate procedures in the event of a navigational equipment failure	e.g. vertical separation (standard, emergency), other non-radar separation (geographical, visual), inform aircraft, seek assistance from adjacent units	4	Lesson  <i>Lesson</i> <i>RSTD</i> <i>AV</i> <i>GTMD</i>	

<b>DEGS</b>	<b>DEGRADED SYSTEMS CAPABILITY</b>			
<b>Objectives</b>	<b>Training Content</b>	<b>L</b>	<b>Type of Training Event</b>	<b>Educational Material and References</b>
			Team Simul  <i>SIMUL</i> <i>REAL</i> <i>SIM</i> <i>ITMD</i>	

L = Level

**Terminal Area Control Endorsement**

AGA	AERODROMES			
Objectives	Training Content	L	Type of Training Event	Educational Material and References
L = Level				
1.1.1	Students shall recognise and understand the design and layout of aerodromes		Lect.  <i>LECT. RSTD AV GTMD</i>	
<b>1 General</b>				
<b>1.1 Standards and Recommended Practices (SARPs)</b>				
1.1.1	Explain the difference between SARPs	ICAO Annex 14	2	
<b>1.2 Definitions</b>				
1.2.1	Describe the general layout of an aerodrome	ICAO Annex 14	2	
1.2.2	Define the component parts of an aerodrome	ICAO Annex 14 e.g. aerodrome elevation, reference point, apron, movement area, manoeuvring area	1	
<b>1.3 Co-ordination</b>				
1.3.1	Identify the information that has to be passed between Air Traffic Services and the airport authority	Airport conditions, fire/rescue category, condition of ground equipment and navigational aids, AIRAC, ICAO Annex 14	3	

AGA	<b>AERODROMES</b>				
Objectives	Training Content	L	Type of Training Event	Educational Material and References	
L = Level					
<b>2 Movement Area</b>					
<b>2.1 Movement Area</b>					
2.1.1 Describe Movement Area	ICAO Annex 14	2			
2.1.2 Explain the marking of obstacles and unusable or unserviceable areas	Flags, signs on pavement, lights	2			
2.1.3 Identify the conditions of the movement area that have to be passed to aircraft		3			
<b>2.2 Manoeuvring Area</b>					
2.2.1 Describe manoeuvring area	ICAO Annex 14	2			
2.2.2 Describe Taxiway		2			
2.2.3 Describe the daylight marking on taxiways		2			
2.2.4 Describe taxiway lighting		2			
<b>2.3 Runways</b>					
2.3.1 Describe runway	Runway, runway surface, runway strip, shoulder, runway and safety areas, clearways, stopways	2			
2.3.2 Describe instrument runway	Annex 14	2			
2.3.3 Describe non-instrument runway	Annex 14	2			
2.3.4 Explain declared distances	TORA, TODA, ASDA, LDA	2			
2.3.5 Explain the differences between ACN and PCN	Strength of pavements	2			

AGA	<b>AERODROMES</b>				
Objectives	Training Content	L	Type of Training Event	Educational Material and References	
L = Level					
2.3.6	Explain the numbering system and orientation of runways	Deka degrees, left, centre, right	2		
2.3.7	Describe the daylight markings on runways	e.g. colour, designation, centre line, threshold, aiming point, fixed distance, touchdown zone, side strip	2		
2.3.8	Describe runway lights	e.g. colour, centre line, intensity, edge, touchdown zone, threshold, barrettes	2		
2.3.9	Explain the functions of visual landing aids	e.g. AVASI, VASI, PAPI	2		
2.3.10	Describe the approach lighting systems	Centre line, cross bars, stroboscopic, colours, intensity and brightness	2		
2.3.11	Characterise the effect of water/ice on runways	Damp, wet, water patches, flooding, snow, slush, ice	2		
2.3.12	Describe braking action		2		
2.3.13	Explain the runway visual range		2		
<b>3 Obstacles</b>					
<b>3.1 General</b>					
3.1.1	Explain the standards and recommendations for obstacle restrictions	Obstacle limitation surface, obstacle limitation requirements, objects outside the obstacle limitation surfaces, other obstacles	2		

AGA	AERODROMES			
Objectives	Training Content	L	Type of Training Event	Educational Material and References

L = Level

3.2 Obstacle Limitation Surfaces				
3.2.1 Explain obstacle clearance surfaces	Outer horizontal, conical, inner approach, transitional, inner transitional, balked landing, take off climb	2		



## **ANNEX A: PROCEDURES FOR MODULE 7**

### **1. GENERAL PROCEDURES**

#### **1.1 Introduction**

The vertical dimensions of the Airosar *Upper Flight Information Region* (UIR) are from FL 245 to unlimited. An outline of UIR and sector boundaries is shown on [Map 1](#).

DG7 sector is a sector within the Airosar UIR. There are two other sectors within the Airosar UIR, Beelan and Redee. Adlin UIR is located to the west of Airosar UIR and has two sectors, Menra and Nolan – [Map 1](#).

This document details the DG7 sector dimensions and route structures, the sector operating procedures and the responsibilities of the sector executive and planner controllers.

#### **1.2 DG7 Airspace**

##### **1.2.1 General**

The DG7 sector is a sector within the Airosar UIR operated by an Executive Controller and a Planner Controller. Flights are assigned flight levels in accordance with the 'Tables of Cruising Levels' published in ICAO Annex 2. All aircraft entering the airspace at FL 290 or above will be MASPS<sup>(3)</sup> compliant for RVSM<sup>(4)</sup> procedures.

##### **1.2.2 Lateral Dimensions and Vertical Dimensions**

The lateral dimensions of the DG7 Sector are shown in [Map 2](#). The vertical dimensions are FL 245 to unlimited.

##### **1.2.3 Airspace Category**

The DG7 Sector airspace is classified as ICAO Category A.

##### **1.2.4 Responsibilities**

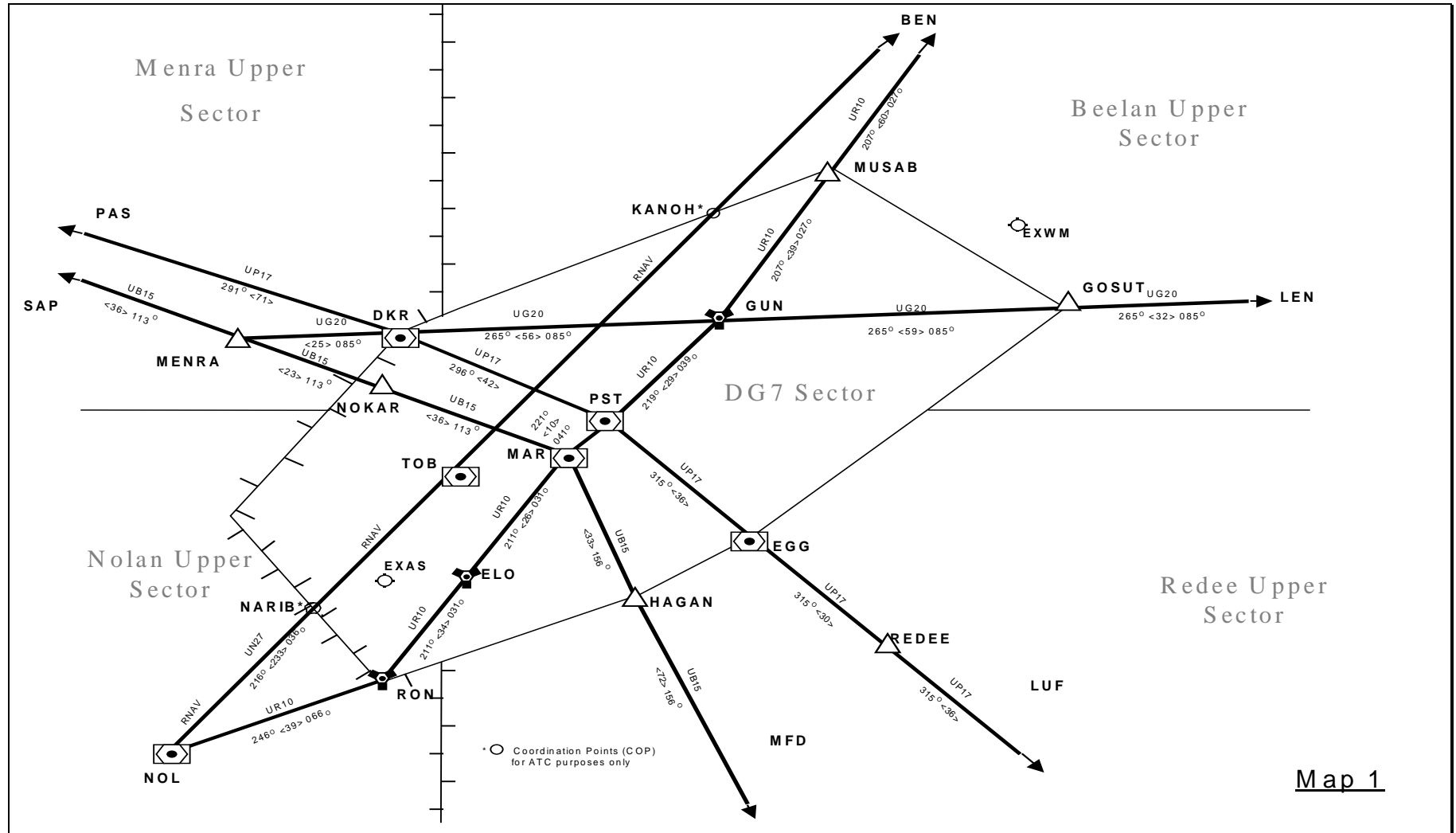
The DG7 Sector provides Air Traffic Control Service to aircraft within the sector.

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<sup>(3)</sup> MASPS = Minimum Aircraft Systems Performance Specifications

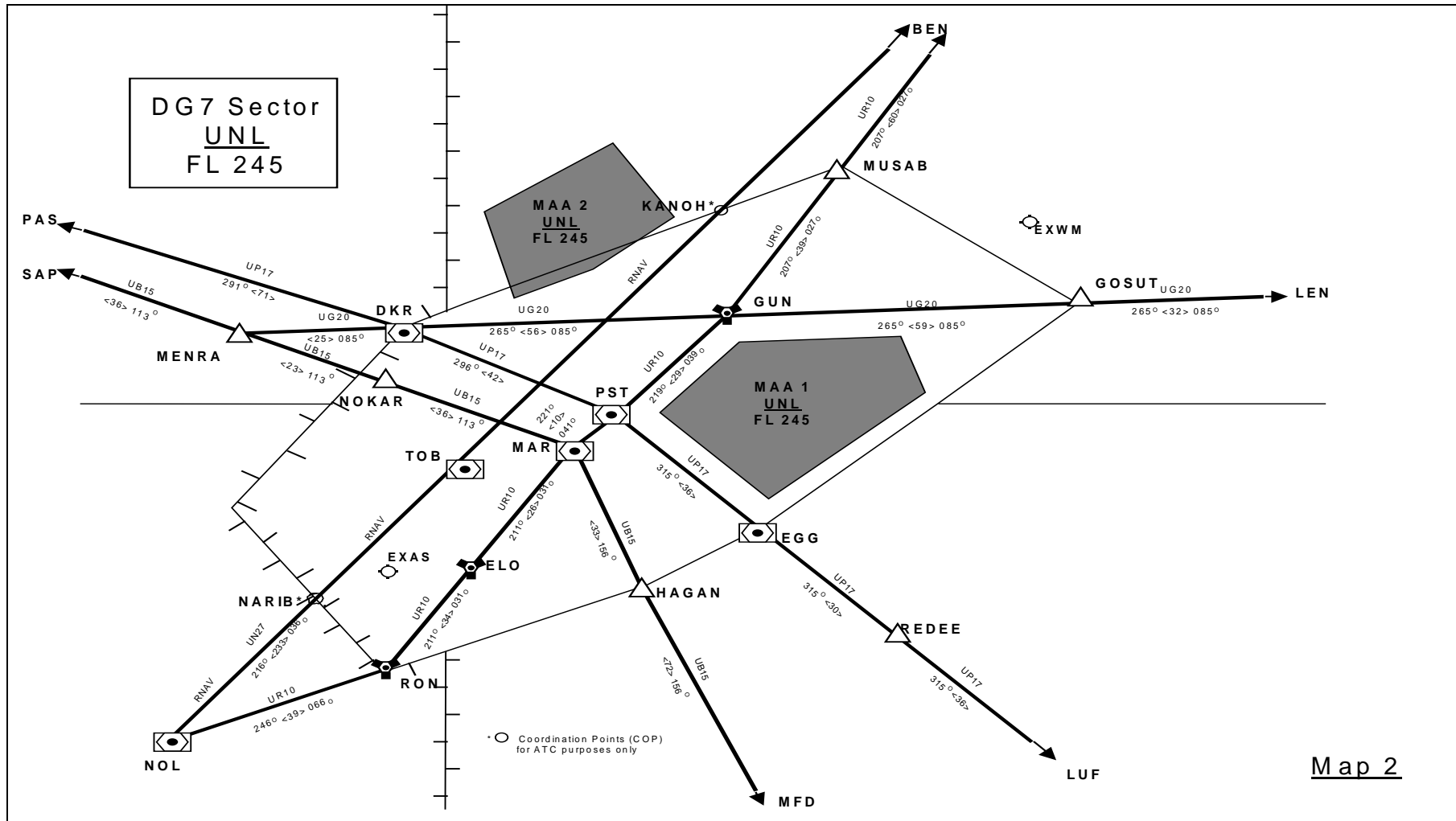
<sup>(4)</sup> RVSM = Reduce Vertical Separation Minimum

Map 1: Airosar UIR



Map 1

Map 2: DG7 Sector



### 1.2.5 Adjacent Airspace

<b>ADJACENT AIRSPACE</b>	<b>EXIT/ENTRY UPPER ATS ROUTES</b>
a) Redee sector	: UB15, UP17
b) Beelan sector	: UR10, UG20, UN 27
c) Nolan sector	: UR10, UN 27
d) Menra sector	: UB15, UP17, UG20
e) Airosar TMA	: Lower Airspace

### 1.2.6 Military Air Exercise Area

The lateral dimensions of MAA 1 and MAA 2 airspace are as shown in Map 2.

Times of activity of MAA 1 and MAA 2 will be as scheduled in the practical exercises.

The vertical dimensions of MAA 1 and MAA 2 are from FL 245 / unlimited.

### 1.3 Navigation Aids and Intersections

SAP	SUMMAP	DVOR/DME
MENRA	MENRA	INTERSECTION
NOKAR	NOKAR	INTERSECTION
MAR	MARIO	DVOR/DME
HAGAN	HAGAN	INTERSECTION
MFD	MANFORD	VORTAC
PAS	PASTA	DVOR/DME
DKR	DEKER	DVOR/DME
PST	PISTE	DVOR/DME
EGG	EGGIB	DVOR/DME
REDEE	REDEE	INTERSECTION
LUF	LUMFAR	VORTAC
MUSAB	MUSAB	INTERSECTION
BEN	BEELAN	VORTAC
GUN	GUNNA	VORTAC
ELO	EKELO	VORTAC
RON	RONALD	VORTAC
TOB	TOBAR	DVOR/DME
GOSUT	GOSUT	INTERSECTION

NOL	NOLAN	DVOR/DME
LEN	LINEEN	DVOR/DME
NARIB	NARIB	COP
KANOH	KANOH	COP

## 1.4 Duties Common to Executive and Planner Controllers

- Adjust the relevant displays so that control functions can be performed properly and notify the instructor of any technical failure.
- Analyse, plan and control the flow of traffic by use of system and radar derived information.
- Detect potential conflicts between aircraft by use of system and radar derived information.
- Provide and maintain the prescribed separation between aircraft and between aircraft and airspace boundaries.
- Manage several coinciding tasks while maintaining situational awareness.
- Monitor flight data displays and ensure that they are maintained up-to-date.
- Prioritise tasks and delegate when appropriate.
- Communicate in a clear and precise manner using standard phraseology when available.
- Ensure that all co-ordinations are carried out in accordance with prescribed.
- Manage complete or partial communications failures.
- Assist and give priority to aircraft in emergency and take all actions necessary to ensure aircraft safety.

## 1.5 Co-ordination Procedures

### 1.5.1 General

ACT messages are transmitted via On-line Data Interchange (OLDI) to automatically update and activate the corresponding flight plans in the receiving centre 10 min. before the co-ordination Point (COP).

If it is necessary to pass a verbal revision the planner controller shall ensure that the OLDI system is updated.

When an Activation Message (ACT) has not been successfully transmitted the Planner Controller shall ensure co-ordination. In this case estimates will be passed as follows:

<u>Adjacent UAC/Sector</u>	<u>Routing</u>	<u>COP</u>
Redee Sector	UB15	HAGAN
Beelan Sector	UG20	GOSUT
Beelan Sector	UR10	MUSAB (Northbound)
Menra Sector	UG20	DKR
Menra Sector	UP17	DKR
Nolan Sector	UR10	RON (Southbound)
Nolan Sector	UN27	NARIB (UIR Boundary)
Beelan Sector	UN27	KANOH (DG7 Boundary)

Revisions to estimates shall be passed as appropriate.

The DG7 sector will co-ordinate on an individual basis the transfer of control for aircraft descending into the Airosar Terminal Area (TMA).

### 1.5.2 Expedite Clearance

An Expedite Clearance is an urgent clearance request from an ATS unit to the ATS unit concerned for an aircraft in flight whenever the flying time to the transfer of control point is less than the agreed pre-notification time. (*EATCHIP – The Common Format, Cross Border, Inter-Centre Letter of Agreement*).

The pre-notification time for the DG7 sector is 10 min.

Flight level changes for an already notified aircraft which is within 5 min. of the transfer of control point shall also be in the form of an 'Expedite Clearance'.

### 1.5.3 Approval Request

An Approval Request is a request from an ATS unit to the ATS unit concerned for an approval of:

- an aircraft not yet airborne, whenever the flying time to the transfer of control point is less than the agreed minimum pre-notification time, or,
- an aircraft in flight intending to operate under conditions other than those described in mutually agreed procedures. (*EATCHIP – The Common Format, Cross Border, Inter-Centre Letter of Agreement*).

## **1.6 Release Procedures**

### **1.6.1 Release for Climb**

A Release for Climb is an authorisation for the accepting unit to climb (a) specific aircraft before the transfer of control.

Note: The transferring unit remains responsible for separation within its area of responsibility unless otherwise agreed. (*EATCHIP – The Common Format, Cross Border, Inter-Centre Letter of Agreement*).

### **1.6.2 Release for Descent**

A Release for Descent is an authorisation for the accepting unit to descend (a) specific aircraft before transfer of control.

Note: The transferring unit remains responsible for separation within its Area of Responsibility unless otherwise agreed. (*EATCHIP – The Common Format, Cross Border, Inter-Centre Letter of Agreement*).

### **1.6.3 Release for Turn**

A Release for Turn is an authorisation for the accepting unit to turn (a) specific aircraft away from the current flight path by not more than 45° before the transfer of control.

Note: The transferring unit remains responsible for separation within its area of responsibility unless otherwise agreed (*EATCHIP – The Common Format, Cross Border, Inter-Centre Letter of Agreement*).

### **1.6.4 ADJACENT AERODROMES**

Molam (EXWM) : Bearing 067/53 NM GUN

Airosar (EXAS) : Bearing 263/16 NM ELO

Adlin (EXAN) : Bearing 295/50 NM DKR

Manford (EXMD) : Bearing 160/73 NM HAGAN

Rakon (EXRN) : Bearing 029/65 NM MUSAB

Hammtown (EXHT) : Bearing 121/13 NM PST

## **2. EXECUTIVE CONTROLLER RESPONSIBILITIES**

### **2.1 Radar Separation Minima**

The radar separation shall be a minimum of 5 NM (9.3 km).

### **2.2 Specific Duties of the Executive Controller**

- Maintain a continuous listening watch on the sector frequencies and carry out all RTF communication.
- Take the necessary control actions within the sector's area of responsibility to comply with the plan established by the Planner Controller.
- Liaise with the Planner Controller when planned exit levels cannot be achieved.
- Ensure that the Planner Controller is warned that the traffic situation is developing to the extent that the sector could be overloaded.
- Ensure that the Planner Controller is informed of any potential or actual emergency or unusual occurrence taking place within the sector's area of responsibility.

### **2.3 Radar Identification**

- The radar identification methods described in ICAO Doc 4444 shall be used.
- All correlated traffic from an adjacent sector may be considered as being identified, as the identification established by the previous sector is maintained by the system.
- If the transfer of radar identity is necessary it shall be completed in accordance with the procedures in ICAO Doc 4444.

### **2.4 Transfer of Control**

Generally, the transfer of control shall be at the sector boundary unless otherwise agreed by prior co-ordination. In order to ensure separation between traffic operating in the vicinity of the sector boundaries aircraft shall not be vectored, climbed or descended while within 2½ NM of the sector boundary, unless prior co-ordination is effected.



## 2.5 Transfer of Communications

### 2.5.1 General

Transfer of communications for aircraft entering/exiting the DG7 Sector from/into adjacent sectors/units shall be effected at a point not closer than 10 NM from the appropriate sector/unit boundary unless agreed by prior co-ordination.

### 2.5.2 Callsigns of Sectors/Units and Frequencies

SECTOR	CALLSIGN	FREQ/CHANNEL
a) DG7 Sector	Airosar Radar	133.250
b) Nolan Upper Sector	Adlin Radar	132.850
c) Menra Upper Sector	Adlin Radar	127.625
d) Redee Upper Sector	Airosar Radar	120.050
e) Airosar TCL	Airosar Radar	124.075
f) Beelan Upper Sector	Airosar Radar	131.050

### Determination of Level Occupancy

The procedures shall be in accordance with ICAO Doc 4444.

### **3. PLANNER CONTROLLER RESPONSIBILITIES**

#### **3.1 Introduction**

The following paragraphs are meant to guide the Planner Controller in planning traffic. The Planner Controller together with the Executive Controller are expected to use their initiative in those circumstances that may require special handling.

#### **3.2 Planning Standards**

The Planning Standards are:

- a) The Procedural Separation Standards, as listed in ICAO Doc 4444.
- b) The Reduced Longitudinal Separation Standards as laid down in ICAO Doc 7030.
- c) The Radar Separation planned between aircraft on the same track, same level – 10 NM constant or increasing unless co-ordinated.
- d) 20 NM for traffic on crossing tracks.

#### **3.3 Conflict Warning**

The Planner Controller will provide warning to the Executive Controller when, taking into account entry flight levels and the projected tracks of aircraft entering the sector, the Planning Standards are infringed.

Before passing such warning the Planner Controller will ascertain that the flight plans of the aircraft concerned are available and that at least one of the conflicting aircraft is displayed on the radar display.

#### **3.4 Specific Duties of the Planner Controller**

- Plan and accept aircraft safely into the sector in accordance with prescribed procedures.
- Plan exit conditions according to the Planning Standards or as agreed with the accepting unit/sector.
- Co-ordinate with adjacent units/sectors joining and crossing clearances, estimates, revisions, approval requests and expedite clearances in accordance with prescribed procedures.

- Ensure that co-ordination is effected prior to transferring aircraft.
- Co-ordinate with the Executive Controller the acceptance of any aircraft entering the sector's area of responsibility not complying with navigation or communication requirement (e.g. unserviceable transponder).
- Transfer received radar identity of an aircraft to the Executive Controller.
- Ensure that the Executive Controller is aware of any co-ordinated climb or descent made with an adjacent unit/sector.
- Inform the Watch Supervisor of unusual/emergency situations within the sector's area of responsibility.

### 3.5 Sector Procedures

The agreed flight levels for traffic landing in the following airports are as follows.

<u>Aerodrome</u>	<u>Adjacent Sector</u>	<u>Agreed Flight Level</u>	<u>COP</u>
Adlin	Menra	FL 260	15 NM prior DKR
Manford	Redee	FL 250	15 NM prior HAKAN
Rakon	Beelan	FL 250	15 NM prior MUSAB
Molam	Airosar TCL	FL 250	at GUN
Airosar	Airosar TCL	FL 250	at GUN

An inbound clearance shall be issued by the DG7 sector as soon as practicable to all aircraft landing at Airosar.

Aircraft departing from aerodromes within the Menra sector intending to enter the DG7 sector will be cleared by Menra sector to cross the sector boundary at FL 250.

If this restriction cannot be met, Menra sector shall co-ordinate directly with Airosar TCL. In the case where transfer of communication to the Airosar TCL is necessary, Menra sector shall notify the DG7 Sector.

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## ANNEX B: PROCEDURES FOR MODULE 8

### 1. AIRSPACE AND UNIT ORGANISATION

The vertical dimensions of the Airosar FIR are from surface to FL 245. Airosar TMA is an airspace within the Airosar FIR. Airosar TCL is a sector within the Airosar TMA. There are two other sectors within the Airosar FIR, Beelan and Redee. Adlin FIR is located to the west of Airosar FIR and has two sectors, Menra and Nolan – [Map 3](#).

Within the Airosar TMA there are three controlled airspaces, namely:

- (i) A Control Zone surrounding the major airport, Airosar (EXAS) under the jurisdiction of Airosar Tower.
- (ii) Above and around the control zone is Airosar Approach sector under the jurisdiction of Airosar Approach Control.
- (iii) Above and around Airosar Approach sector is a Terminal Control Area, Airosar TCL under the jurisdiction of Airosar TCL – [Map 4](#).

Approach Control and TCL Control are situated in the TCL operations room.

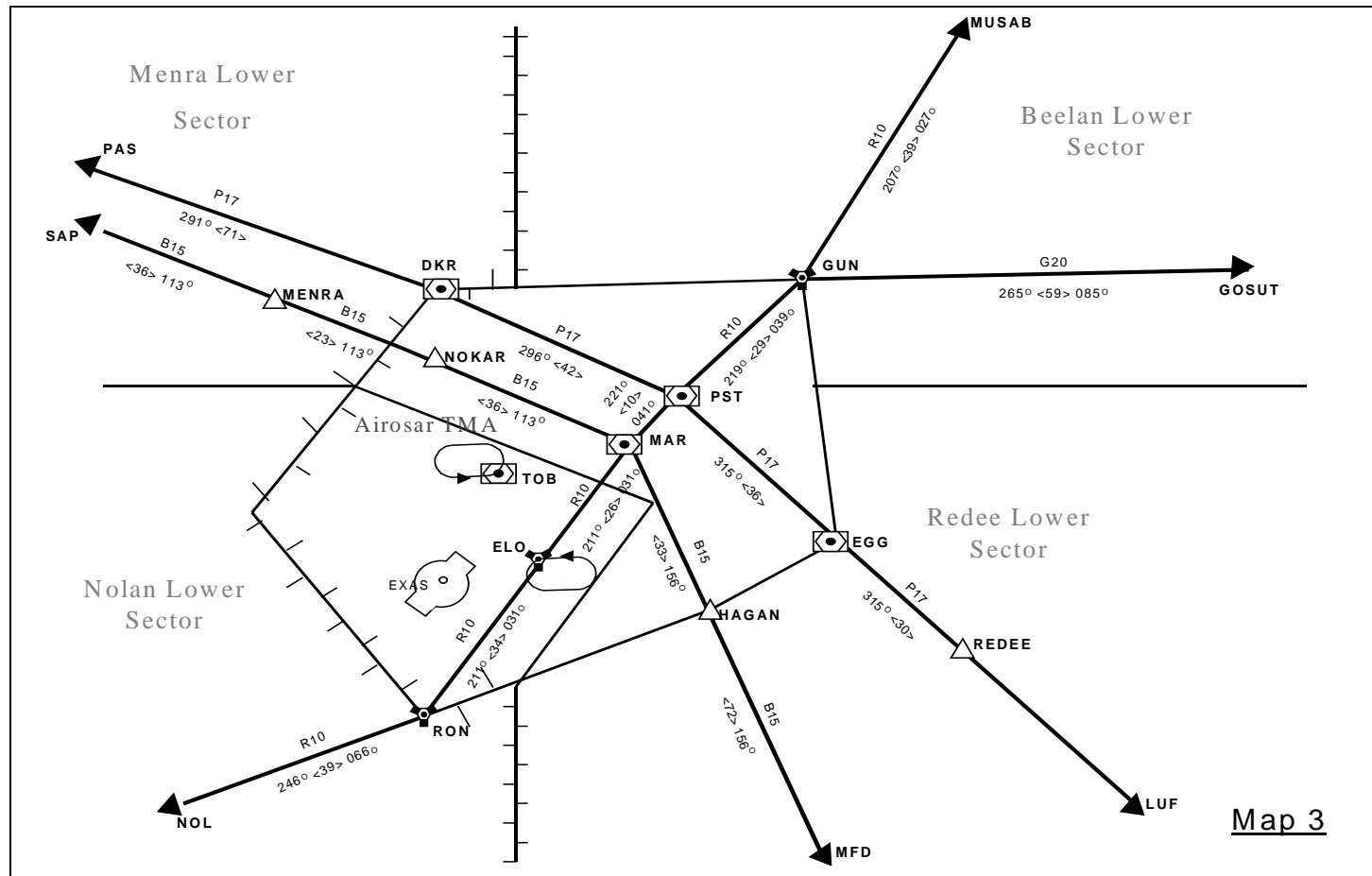
The vertical dimensions and ICAO classifications of Airosar airspace are shown in [Table 6](#).

**Table 6: Airosar Airspace**

AIRSPACE	ORGANISATIONAL SECTOR	DIMENSIONS	CLASS
Airosar CTR	Airosar Tower	SFC - 1000'	D
Airosar APP	Airosar Approach	1000' – FL 95	C
Airosar TCL	Airosar TCL	1000' - FL 95	E
		FL 95 – FL 245	C
Airosar FIR (Below TMA)	Airosar APP/TCL	SFC - 1000'	G
Hammtown Class 'F'	Hammtown Information	SFC - 1000	F

**Note:** A rectangular shaped airspace around Hammtown airport from surface to 1000 ft is designated ICAO Class 'F' airspace when activated - [Map 4](#). See [Appendix 2](#) for details of activation of this airspace.

Map 3: Airosar TMA



Map 3



## **2. GENERAL PROCEDURES**

### **2.1 Radar Separation**

The minimum radar separation within the Airosar TCL is 5 NM.

Outbound aircraft shall be transferred by TCL sectors to en-route sectors radar separated by a minimum of 5 NM, constant or increasing.

### **2.2 Standard Agreement**

An aircraft may enter the airspace under the jurisdiction of another sector without individual co-ordination when it is following a standard route on its own navigation and it has been cleared to, or is at, an agreed level (see 6. 'Agreed Levels') before communication is transferred to the receiving sector.

### **2.3 Transfer of Control**

The transfer of control of traffic is effective at the TMA sector boundaries unless otherwise agreed. Transfer of communication may take place earlier.

### **2.4 Speed Control**

Aircraft shall be transferred to Approach Control at a maximum speed of 250 KT.

### **2.5 Radar Identification**

The radar identification methods described in ICAO Doc 4444 shall be used.

All correlated traffic from an adjacent sector may be considered as being identified.

If the transfer of radar identity is necessary it shall be completed in accordance with the procedures described in ICAO Doc 4444.

### **2.6 Atmospheric Pressure Setting**

The transition altitude for the TMA is 6000 feet.

The minimum holding level available to Airosar TCL at ELO and TOB is FL 100.



### 3. OUTBOUND PROCEDURES

Aircraft departing from EXAS will be on a Standard Instrument Departure (SID) and climbing to FL 90 or lower requested flight level unless otherwise co-ordinated.

Aircraft departing from other airfields within the sector of responsibility are required to obtain a clearance from TCL before take-off.

All aircraft departing from airfields within the TCL sector of responsibility will observe an IAS limit of 250 KT below FL 100. TCL controllers should remove speed limitations as soon as traffic permits.

### 4. INBOUND PROCEDURES

#### 4.1 Standard Arrival Routes

Aircraft inbound to EXAS will be routed via Standard Arrival Routes (STARs) as shown in Table 7.

Table 7: STARs

ROUTE	HOLDING AREA	STAR
MUSAB-GUN-PST-MAR-TOB	TOB	MARIO 1G
GOSUT-GUN-PST-MAR-ELO	ELO	MARIO 1A
REDEE-EGG-ELO	ELO	EGGIB 1A
MENRA-NOKAR-TOB	TOB	NOKAR 1G

#### 4.2 Releases to Approach Control

- Aircraft should be released in level order. Any level lower than FL 100 in the holding areas shall be co-ordinated with Approach Control. Transfer of communication shall be effected in level order and in sufficient time for aircraft to be given heading or holding instructions before reaching the hold.
- Aircraft cleared to a holding facility shall be vertically separated and not in conflict with overflying traffic before control is transferred.
- Release messages shall contain the following information in the standard sequence of:
  - holding area
  - callsign
  - flight level
  - release point
  - contact point
  - any qualifying instructions

## 5. HOLDING PROCEDURES

### 5.1 Separation Between Holding and Overflying Aircraft

Vertical separation between overflying aircraft approaching the holding fix and aircraft already holding in the particular area is to be established before the overflying aircraft has reached the minimum distances shown in [Table 8](#).

[Table 8](#): Vertical Separation from Holding Fix

FLIGHT LEVEL	DISTANCE FROM HOLDING FIX
FL 150 and below	15 miles
FL 160 to FL 200	25 miles
FL 210 and above	30 miles

Aircraft established in the TOB holding area are separated from aircraft established in the ELO holding area up to and including FL 140.

Standard ICAO holding speeds apply in the TOB and ELO holding patterns.

## 6. AGREED LEVELS

The agreed levels for aircraft arriving/departing from aerodromes in the Airosar TMA are shown in [Table 9](#).

[Table 9](#): Agreed levels

ADJACENT SECTOR	ROUTE	COP	INBOUND LEVEL	OUTBOUND LEVEL
Menra	IN-B15	IN-NOKAR	170	
	OUT-P17	OUT-DKR		160
Beelan	R10 AND G20	GUN	240	230
Redee	P17	EGG	200	N/A
DG7	R10 & G20	GUN	250	240

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## **APPENDIX 1: LETTER OF AGREEMENT BETWEEN AIROSAR TCL RADAR AND AIROSAR APPROACH**

### **1. GENERAL**

#### **1.1 Purpose**

This LOA describes co-ordination and control procedures for IFR and VFR flights between Airosar TCL and Airosar APP.

#### **1.2 Deviations**

In exceptional cases and if close co-ordination and agreement between the two parties exist, short-time deviations from these regulations are permitted for the purpose of improved traffic handling.

### **2. AREAS OF RESPONSIBILITY**

The areas of responsibility are displayed on the attached Airosar TMA chart.

### **3. CO-ORDINATION**

#### **3.1 Data Exchange**

Estimates are exchanged not later than 10 min. before the ETO and generally transferred by means of automated data exchange (OLDI).

#### **3.2 Arrivals**

The COP and clearance limit for all arrivals to EXAS is either ELO or TOB.

#### **3.3 Departures**

SIDs are published in the approach documentation for all departures from EXAS.

### **3.4 Transit Flights**

Transit flights through Airosar Approach airspace shall be co-ordinated on an individual basis.

## **4. CONTROL PROCEDURES**

### **4.1 Arrivals**

Arrivals to EXAS are generally released at FL 100. Individual co-ordination shall be effected if arrivals shall be released at any other flight level.

#### **4.1.1 Routing**

If not otherwise co-ordinated arrivals to EXAS are cleared via the published STARs.

#### **4.1.2 Radar Handover**

Radar handovers are not necessary if the separation between succeeding arrivals is 5 NM constant or increasing.

#### **4.1.3 Transfer of Control**

Transfer of control shall generally take place upon crossing the common boundary between areas of responsibility.

#### **4.1.4 Transfer of Communications**

Transfer of communications shall take place as early as possible, but not later than crossing the boundary between the areas of responsibility.

### **4.2 Departures**

Departures from EXAS are released at FL 90 unless otherwise agreed by individual co-ordination.

#### **4.2.1 Routing**

If not otherwise co-ordinated departures from EXDG are cleared via the published SIDs.

**4.2.2 Radar Handover**

Radar handovers are not necessary, if the separation between succeeding departures is 10 NM constant or increasing.

**4.2.3 Transfer of Control**

Transfer of control shall generally take place upon crossing the common boundary between areas of responsibility.

**4.2.4 Transfer of Communications**

Transfer of communications shall take place as early as possible, but not later than crossing the boundary between the areas of responsibility.

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## **APPENDIX 2: LETTER OF AGREEMENT BETWEEN AIROSTAR TMA AND HAMMTOWN AIRPORT**

### **1. GENERAL**

#### **1.1 Purpose**

This Letter of Agreement (LOA) describes supplementary procedures to the general regulations as laid down in the Airosar TCL operating procedures. It details the co-ordination and control procedures for IFR flights inbound to and outbound from Hammtown airport (EXHT).

EXHT is situated Southeast of PST bearing 121/13 NM. Opening hours are 0700/1800 Mon/Fri and 0900/1600 Sat/Sun. EXHT is equipped with an ILS on runway 28 – [Map 4](#).

#### **1.2 Deviations**

In exceptional cases and if close co-ordination and agreement between the two parties exist, short-term deviations from these regulations are permitted for the purpose of improved traffic handling.

### **2. AREAS OF RESPONSIBILITY**

#### **2.1 IFR Flights**

The responsibility for the provision of approach control service for all arriving and departing IFR flights rests with Airosar TCL Radar.

#### **2.2 Aerodrome Flight Information Service**

The responsibility for the provision of Aerodrome Flight Information Service (AFIS) within class F airspace rests with Hammtown Information.

### **3. CO-ORDINATION**

#### **3.1 Arrivals**

For the co-ordination of arrivals to Hammtown, Airosar TCL Radar shall provide the following data to Hammtown Information:

- callsign,
- ACFT type,
- SSR code,
- EST for PST (IAF and clearance limit),
- type of approach.

Hammtown Information shall inform Airosar TCL radar of the ATA immediately after landing.

#### **3.2 Departures**

Hammtown Information shall request a clearance from Airosar TCL for departures, stating the runway-in-use and ETD and shall relay this clearance to the departing aircraft.

Hammtown Information shall inform Airosar TCL of the ATD immediately after departure.

### **4. ACTIVATION OF HAMMTOWN AIRPORT**

#### **4.1 Arrivals**

Class F airspace will be activated for arriving aircraft 10 min. before the aircraft is estimated over PST VOR.

Class F airspace is automatically considered to be deactivated after the aircraft has landed.

#### **4.2 Departures**

Class F airspace will be activated 5 min. before the ETD of the ACFT.

Class F airspace is automatically considered deactivated once the departing ACFT has left the airspace.

### **4.3 Co-ordination**

Airosar TCL Radar and Hammtown Information inform each other about the activation/deactivation of Class F airspace.

### **4.4 Procedures**

#### **4.4.1 Separation**

Separation between IFR flights is assured by allowing only one aircraft at a time into Class F airspace.

#### **4.4.2 Flight Information Service**

Responsibility for the provision of FIS within and regarding Class F airspace is with Hammtown Information. To facilitate the provision of FIS arriving aircraft will always route via PST.

#### **4.4.3 Deviations**

Hammtown Information will inform Airosar TCL Radar immediately about any deviations from published procedures and about missed approaches.

#### **4.4.4 Transfer of Communication**

Arrivals are advised to contact Hammtown Information before entering Class F airspace.

Departures are required to contact Airosar TCL Radar immediately after departure.

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**ANNEX C: SPECIFY WORKLOAD**

To specify more accurately the workload, we use the diagram provided by the method of the IANS course on simulation creations.

This method is detailed in Section 3.

**1. WORKLOAD FOR MODULE 7**

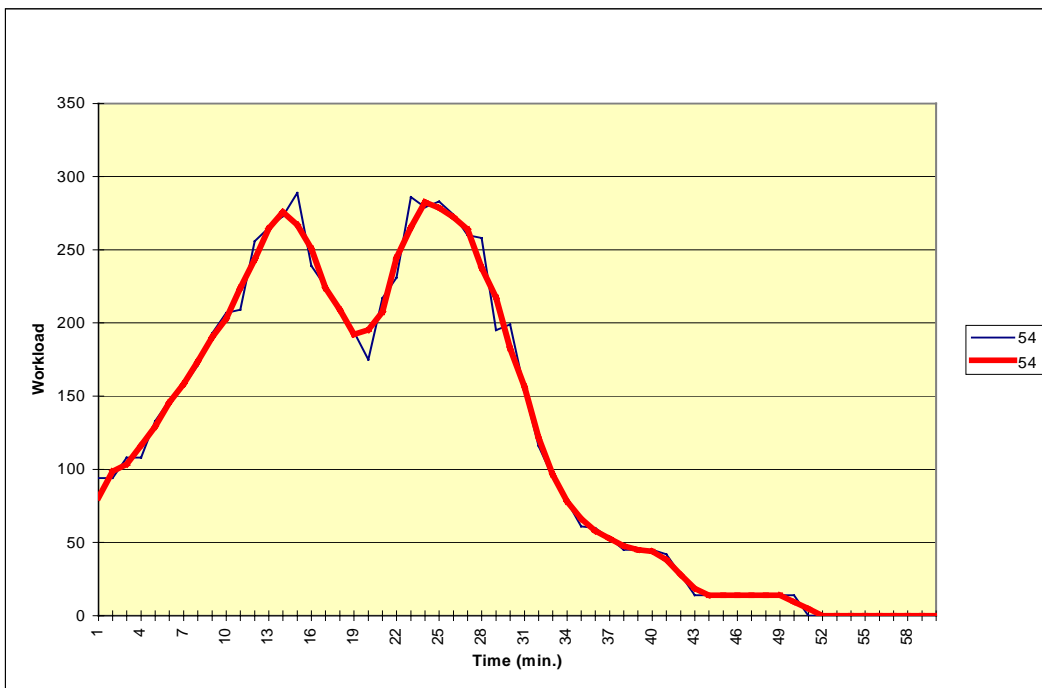


Figure 2: Exercise Workload

This workload is based on a 35 min. duration simulation. This has to be extended to 45 min.

## 2. WORKLOAD FOR MODULE 8

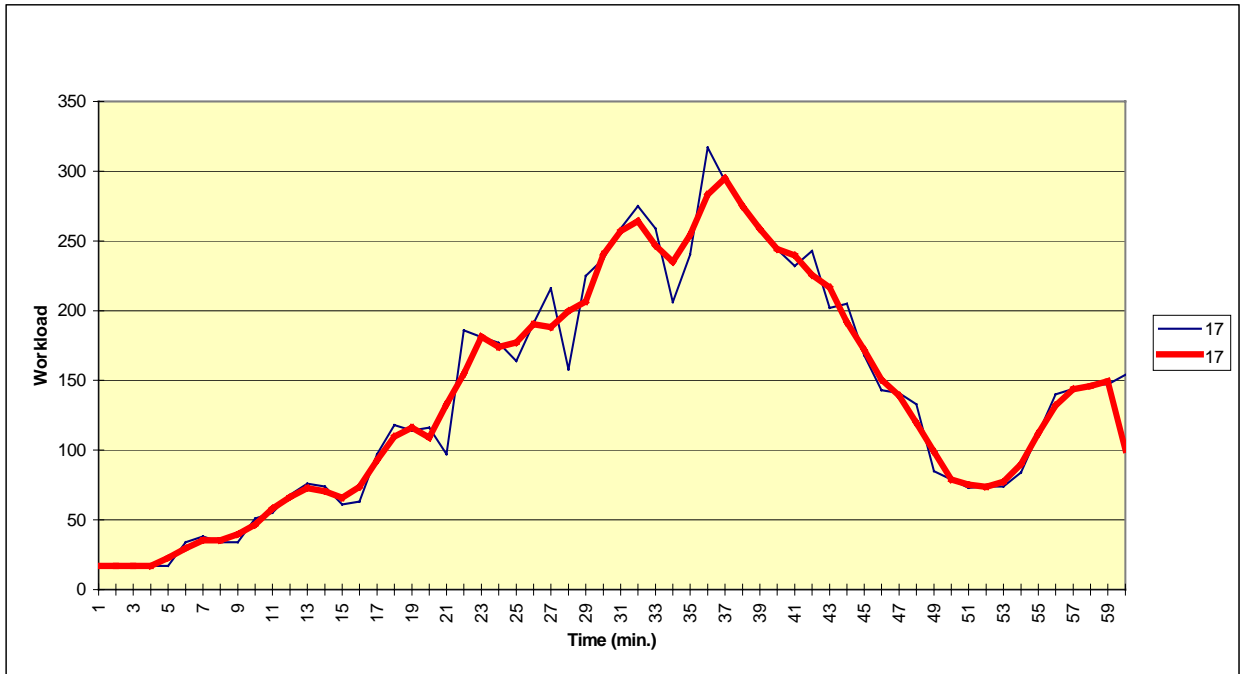


Figure 3: Exercise Workload

## 2.1 IANS Method to Measure Workload

## 2.2 Measuring the Workload

The first duty is to identify what factors are contributing to the workload of the student, based mainly on the physical activity. The next step is to assign **points or weights** to each factor based on a relative comparison between them and finally sum up all the related points per minute of exercise duration to produce a graph.

If  $p_j$  are the **Points or Weights of Workload Factors** existing in time interval  $Dt$  (in practice we proceed in steps of 1 min.) then we define a quantity called 'Workload' (WL) as:

$$WL = \frac{\sum p_j}{Dt}$$

The variation of WL along the exercise duration will produce the **Workload Graph**.

This graph will represent the Workload (WL) variation or distribution along the exercise time. The resulting Graph will have then to be shaped according to some patterns linked with the particular course phase.

## 2.3 Deciding about Factors Contributing to Workload

To decide factors of workload we should think of each one alone at a time.

### Example

We know for instance that a CONFLICT situation does create more load than a non conflict one. The speed difference during a conflicting situation creates additional problem for a student than with same speed traffic. According to the action taken to solve a conflict a VECTORING action necessitates more care and skill than with a simple level change. Yet when aircraft are CLIMBING or DESCENDING their Mode-C indication must be properly monitored or altitude reports received. The number of AIRCRAFT monitored at a moment and the way this information is displayed SSR or maybe only PRS or if the aircraft is known or UNKNOWN are also factors to be considered independently. So we end up with the following list of Workload Factors:

- CONFLICT
- SPEED
- VECTORING
- CLIMB/DESCEND
- SSR ACFT
- PSR ACFT
- UNKNOWN ACFT.

How much we may continue depends on the exercise designer who will eventually advise accordingly the training objectives. One may keep on going deeper and deeper either to further analyse or add more factors. There can be, theoretically, a long list for all workload factors but the aim is that every designer understands the process and decides his own set. Again not all problems exist for all training units or phases.

## 2.4 Deciding about Points for Every Workload Factor

Any pointing system has a meaning only if it can faithfully represent the **relative value or strength** of the various elements it weights. The workload points that can be allocated for each factor on the list needs the agreement of a larger number of instructors to **avoid objectivity** as much as we can.

The absolute values are not important at all, there is no absolute scale or universal pointing system only the relative values are of interest. This is why we should try to be satisfied that the points do reflect the relative difficulty between them. The relative difficulty could be measured as follows:

<u>Workload Factors</u>	<u>Workload Points (p<sub>i</sub>)</u>
CONFLICT	20
SPEED	10
VECTORING	30
CLIMB/DESCEND	5
SSR ACFT	2
PSR ACFT	4
UNKNOWN ACFT	5

Why two points for monitoring an SSR aircraft per min. and five for monitoring an unknown one is not the point to check, but whether the ratio of 5/2 will indicate how much the monitoring of an unknown traffic is considered as 5/2 times harder than monitoring an SSR traffic - and so on.

The more you go deeper into an analysis of factors the more you may need a larger scale of points to describe them. For instance, one could say that the factor CONFLICT is too vague and that, in ACC for instance, the angle of conflicting tracks is a very important conflict factor. The results of such an analysis could be as follows:

<u>Workload Factors</u>	<u>Workload Points (p<sub>i</sub>)</u>
CONFLICT at angles of 90 degrees	25
CONFLICT at angles of 60 degrees	20
CONFLICT at angles of 30 degrees	17
CONFLICT at reciprocal tracks	15
CONFLICT at same tracks	15

This may be considered as a more 'honest' approach to the problem but others could reject it as becoming less objective – different instructors have different views about the difficulty of each case - and too detailed to make a



real change on the total of the workload at a moment. It is left up to the exercise designer to decide. In general, if some factors have points that are becoming equivalent, within limits of  $\pm 5\%$  of difference, it is not important to differentiate them. The use of a spreadsheet, though, simplifies the working process and in practice it is not difficult at all to use either a short or a detailed list of factors and points as calculations are derived automatically.

## **2.5 Proposed Workload Factors and Points or Weights**

To make it possible to work on a practical example a list of a set of factors and their points must be provided. The following list is not to be considered as a standard but it is part of the working material available as an example on the practical phase of this course and it is embedded in the spreadsheet on which the workload is calculated.

The workload factor CODE NAME or identifier on the first column can be any shortcut or a full name that is decided by the instructor, while the points are found on the third column and can be simply modified by typing another value in the cell of the spreadsheet. In the second column there is a short reminder text of its meaning to the user.

The basic principle on the workload factors is that every factor is calculated independently and added on top of any others co-existing at the time with the same or other flights.

## **3. EXPLANATIONS ON THE MEANING AND USE OF EVERY WORKLOAD FACTOR**

The use of workload factors refers to any course type, radar or non-radar, and the choice and points allocated can be very different. The ones explained in Table 10 are for a radar course.

Table 10: Radar course workload factors

<b>PROBLEM IDENTIFIER</b>	<b>SHORT DESCRIPTION</b>	<b>Weight/pts</b>
<b>AIRCRAFT</b>		
<b>SSR</b>	Monitoring identified SSR ACFT	<b>2</b>
<b>I_SSR</b>	Identify an SSR ACFT	<b>3</b>
<b>PSR</b>	Monitoring identified non-SSR ACFT	<b>3</b>
<b>I_PSR</b>	Identify a non-SSR ACFT	<b>4</b>
<b>UNKN</b>	Monitoring an unknown ACFT	<b>5</b>
<b>CONFLICT RISK (before action is taken)</b>		
<b>LARGE</b>	'Concerned' for tfc conv near sep minim	<b>2</b>
<b>SHORT</b>	'Concerned' for tfc conv below sep minim	<b>3</b>
<b>CO-ORDINATION</b>		
<b>COO_S</b>	Standard Co-ord for the unit (e.g. transfer)	<b>4</b>
<b>COO_A</b>	Additional, for req. release, changes, etc.	<b>5</b>
<b>TEL_HVR</b>	Radar handover for each ACFT by tel-call	<b>6</b>
<b>VERTICAL PROFILE</b>		
<b>C_D</b>	ACFT on climb/desc - monitor FL/Mode C	<b>3</b>
<b>CONFLICTING TRACKS</b>		
<b>SAME</b>	Same track traffic on conflict	<b>6</b>
<b>RECIP</b>	Reciprocal track traffic on conflict	<b>6</b>
<b>C_30</b>	Traffic on 30 deg tracks in conflict	<b>8</b>
<b>C_60</b>	Traffic on 60 deg tracks in conflict	<b>8</b>
<b>C_90</b>	Traffic on 90 deg tracks in conflict	<b>10</b>
<b>C_120</b>	Traffic on 120 deg tracks in conflict	<b>9</b>
<b>SPEED DIFFERENCE</b>		
<b>S_60</b>	Conflicting ACFT faster behind by 60 Kt	<b>3</b>
<b>S_120</b>	Conflicting ACFT faster behind by 120 Kt	<b>6</b>
<b>S_240</b>	Conflicting ACFT faster behind by 240 Kt	<b>9</b>
<b>VECTORING</b>		
<b>VEC</b>	While ACFT on vectors ...	<b>10</b>
<b>WIND</b>	Add 3 pts to VEC if wind drift significant	<b>3</b>
<b>SEQ</b>	Add 4 pts to VEC if due to sequence	<b>4</b>
<b>SPEED CONTROL</b>		
<b>SPD</b>	Add 3 pts for speed cntrl due to sep/seq	<b>3</b>
<b>UNUSUAL SITUATIONS</b>		
<b>UNKN_INFO</b>	While passing info for unknown traffic	<b>7</b>
<b>RCFSSR</b>	RCF - transmitter U/S but SSR/squawk OK	<b>8</b>
<b>RCFPSR</b>	RCF - transmitter U/S but no SSR/squawk	<b>10</b>
<b>SSROFF</b>	SSR only is OFF (No Labels) – added to every ACFT	<b>5</b>
<b>NEWROUTE</b>	While Planning Diversion, Missed APP ...	<b>10</b>
<b>EMERGENCY</b>	For ACFT in danger requesting priority	<b>20</b>
<b>RADIO FREQUENCY OCCUPANCY</b>		
<b>MAX_ACFT</b>	Automatically done by spreadsheet-no action required	<b>25</b>
<b>MAXLOAD</b>	Automatically done by spreadsheet-no action required	<b>300</b>

#### 4. THE NUMBER OR AIRCRAFT FACTOR

This is the most basic factor to put on the spreadsheet first for every flight. It counts for every minute we monitor/watch or control a traffic. It can start from the time the student will 'reasonably' care for a traffic until the moment it becomes a 'no concern'. You should normally start from the moment the traffic information is available to the student. Note that according to the particular ATM system used, the time when an inbound traffic information is displayed, varies significantly.

Table 11: Number of aircraft factor

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>SSR</b>	Monitoring identified SSR ACFT	<b>2</b>
<b>I_SSR</b>	Identify an SSR ACFT	<b>3</b>
<b>PSR</b>	Monitoring identified non-SSR ACFT	<b>3</b>
<b>I_PSR</b>	Identify a non-SSR ACFT	<b>4</b>
<b>UNKN</b>	Monitoring an unknown ACFT	<b>5</b>

- SSR corresponds to the display of a transponder equipped ACFT.
- PSR to the display of purely primary radar information (usually without any label to provide identity).
- I\_SSR and I\_PSR to their identification. Vectoring points will be also allocated if so required – usually for a PSR traffic. The points will be assigned usually to 1 min. for the SSR case but more (2 or 3) for the PSR one according to the method used.
- The UNKN for monitoring an unknown aircraft. The typical unknown ACFT is the one that wanders in the sector and no information has been received for it by anyone. Some instructors may consider the difference between unknown with transponder indicating Mode C and those without. This will not, however, produce an important change of the WL/min. unless our objectives demand a significant number of such traffic involved for large periods - as can be the case with some units with much uncontrolled military or VFR traffic.

#### 5. THE CONFLICT RISK

The above factor is significant mainly on the basic training phases where students think a lot before they decide a conflict/no-conflict case and until they decide or not an action to resolve it. At times this is true for the intermediate

training phase as well as in the case of a system not equipped with modern detection facilities, like Medium-term Conflict Detection (MTCD).

A LARGE is used for every minute a conflict appears to be above, but still close, to the separation minima, while SHORT for the one that is foreseen to be at or below them.

Table 12: Conflict risk (before action is taken)

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>LARGE</b>	'Concerned' for tfc conv near sep minim	<b>2</b>
<b>SHORT</b>	'Concerned' for tfc conv below sep minim	<b>3</b>

LARGE or SHORT is calculated only up to the time an action is finally decided - or rejected. For beginner students it is a dominant workload factor which, however, may be ignored for the more advanced ones.

## 6. THE CO-ORDINATION

A very important workload factor often ignored by some designers. We should not forget that a co-ordination involves a combination of physical and mental actions and that it is part of the whole planning. In some cases the technical inefficiency of equipment produces easy saturation of the controller just with 3,4 simultaneous co-ordinations!

The COO\_S represents the standard and typical co-ordination in a unit where we pass data and we propose the acceptance of a flight to the next sector. The COO\_A represents any additional co-ordination demanded for extra actions, like an early release to descend / climb. The system abilities for the handovers is decisive on the load during a co-ordination. In radar we consider that a telephone co-ordination (TEL\_HVR) requires more time and actions from the controller while a silent co-ordination based on electronic symbols is considered as a standard one for a sector.

The co-ordination factor may be ignored if we design exercises for the EXECUTIVE COTROLLER only while the responsibility for all co-ordinations is vested with the PLANNER CONTROLLER alone.

Table 13: Co-ordination

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>COO_S</b>	Standard co-ordination for the unit (e.g. transfer)	<b>4</b>
<b>COO_A</b>	Additional, for req. release, changes, etc.	<b>5</b>
<b>TEL_HVR</b>	Radar handover for each ACFT by tel-call	<b>6</b>

## 7. THE VERTICAL PROFILE

The climb and descend of an aircraft must be monitored by a controller in the sense that he/she should observe the Mode C indication and make sure the aircraft has reached or vacated certain levels. This is why we count additional workload points while the traffic is on a climb or descend ending when the aircraft is at level flight.

Table 14: Vertical profile

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>C_D</b>	ACFT on climb/desc - monitor FL/Mode C	<b>3</b>

## 8. THE CONFLICTING TRACKS

This is a basic analysis of the CONFLICT factor and is applied to **all aircraft involved in the problem**. In some areas, especially in ACC, it is very important to differentiate between the various track configurations, in others it may not make so much sense.

If we design non-radar control exercises a very large difference is expected between the points on various factors (example: opposite, same tracks).

Table 15: Conflicting tracks

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>SAME</b>	Same track traffic on conflict	<b>6</b>
<b>RECIP</b>	Reciprocal track traffic on conflict	<b>6</b>
<b>C_30</b>	Traffic on 30 deg tracks in conflict	<b>8</b>
<b>C_60</b>	Traffic on 60 deg tracks in conflict	<b>8</b>
<b>C_90</b>	Traffic on 90 deg tracks in conflict	<b>10</b>
<b>C_120</b>	Traffic on 120 deg tracks in conflict	<b>9</b>

## 9. THE SPEED DIFFERENCE

This is a factor applied for overtaking traffic (faster behind). The speed differences at multiples of 60 Kt is so chosen mainly because of the easy calculation for separation reduction my 1 NM/min. If the difference is found at any intermediate value, it is up to the instructor to choose which of the three categories is closer. This factor is terminated when the speeds are so established that will keep the separation steady.

Table 16: Speed Difference

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>S_60</b>	Conflicting ACFT faster behind by 60 Kt	<b>3</b>
<b>S_120</b>	Conflicting ACFT faster behind by 120 Kt	<b>6</b>
<b>S_240</b>	Conflicting ACFT faster behind by 240 Kt	<b>9</b>

## 10. VECTORING, WIND EFFECT, SEQUENCING

The vectoring workload is applied for the duration **an aircraft is vectored or even instructed to continue on a heading** for any reason (spacing, navigation, etc.).

Table 17: Vectoring

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>VEC</b>	While ACFT on vectors ...	<b>10</b>
<b>WIND</b>	Add 3 pts to VEC if wind drift significant	<b>3</b>
<b>SEQ</b>	Add 4 pts to VEC if due to sequence	<b>4</b>

The WIND is applied if, during vectoring, the drift to be compensated is considered significant (above 5 degrees). SEQ is applied additional to vectoring if this is done for sequencing reasons and not only just for radar positioning or guidance – that is vectoring for sequencing has a workload point of VEC+SEQ.

## 11. THE SPEED CONTROL

Applied for any instruction of speed control passed and while the speed difference is not yet adjusted at a satisfactory level. It may be also used in ACC for Mach Number adjustments, without vectoring, especially if it is too often encountered in this sector.

Table 18: Speed (SPD) Control

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>SPD</b>	Add 3 pts for Speed Cntrl due to sep/seq	<b>3</b>

## 12. UNUSUAL OCCURRENCES/SITUATIONS

The above factors are in no way a complete set of Emergency cases. They have been included merely as an example for practice. The designer should decide accordingly what cases he/she wants to include and with how many points according to the type and the training phase.

Table 19: Unusual Situations

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>UNKN_INFO</b>	While passing info for unknown traffic	<b>7</b>
<b>RCFSSR</b>	RCF - transmitter U/S but SSR/squawk OK	<b>8</b>
<b>RCFPSR</b>	RCF - transmitter U/S but no SSR/squawk	<b>10</b>
<b>SSROFF</b>	SSR only is OFF (No Labels) - added to every ACFT	<b>5</b>
<b>NEWROUTE</b>	While Planning Diversion, Missed APP ...	<b>10</b>
<b>EMERGENCY</b>	For ACFT in danger requesting priority	<b>20</b>

**UNKN\_INFO:** For the duration we have to pass details of an unknown traffic information to a known one we control. This is obviously added additionally to other factors co-existing for the case, like the Conflict Risk, Conflicting Tracks and certainly the UNKN.

**RCFSSR:** While experiencing a transmitter U/S situation with a transponder equipped traffic than can use the IDENT feature to acknowledge instructions.

**RCFPSR:** Same as above but for no transponder traffic.

**SSROFF:** For the duration the SSR information is U/S from the screen.

**NEWROUTE:** For the duration the student is occupied to re-arrange and plan again his traffic due to a new routing asked or required by a traffic (Diversion, Return to aerodrome, Missed Approach).

**EMERGENCY:** For an ACFT experiencing a dangerous situation and requesting priority of actions by the student.

The time duration of any unusual situation case is decided by the personal judgement of the designer when he/she tests the exercise.

### 13. RADIO FREQUENCY OCCUPANCY

The frequency occupancy is considered as a very important factor in ATC. Sector collapsing or expanding and traffic limitations are mostly related to radio frequency occupancy. It relies exclusively on the personal judgement of the designer to define the conditions of 'radio saturation' in a sector, that is how many aircraft (MAX\_ACFT) monitored at the same, not necessarily all talking together, will create a saturating maximum load (MAXLOAD) in **absolute value**.

This factor is **NOT ADDED**, as it is created automatically by the spreadsheet and follows a linear increase. That is the number of aircraft, say N, at a moment is calculated and extra points are added to the existing workload according to the ratio  $N / \text{MAX\_ACFT}$  or the same, the additional load points added are:

$$= N \times \text{MAXLOAD} / \text{MAX\_ACFT}$$

Table 20: Radio Frequency Occupancy

PROBLEM IDENTIFIER	SHORT DESCRIPTION	Weight/pts
<b>MAX_ACFT</b>	The max. ACFT/min. that can saturate the frequency	25
<b>MAXLOAD</b>	The max. points of WL/min. on a saturated frequency	300

### 14. DECIDING THE SHAPE OF THE WORKLOAD GRAPH

#### Viewing the Graph – smoothing

Because the created graph is a result of a mathematical process we see originally a polygon line that unites all the plotted workload values. This, however, may lead to erroneous concepts especially when abrupt changes of this line are observed. It might be that at one minute we have high workload, then the next minute almost zero workload, then the next minute a huge jump to a much higher value. We understand that the low value in between cannot represent a really 'quiet' moment and no student will feel at ease for one minute while he/she was very busy the rest of the time.

In order to get an 'average' view of this graph a smoothing algorithm is automatically applied in the spreadsheet so as to interpolate plotted values according to the workload tendency between the average of the present and passed minute and the value of the next one. Again this is done automatically by the spreadsheet and both the actual and the smoothed graphs are displayed, although the second one only is highlighted in bold red (see [Figure 4](#)).



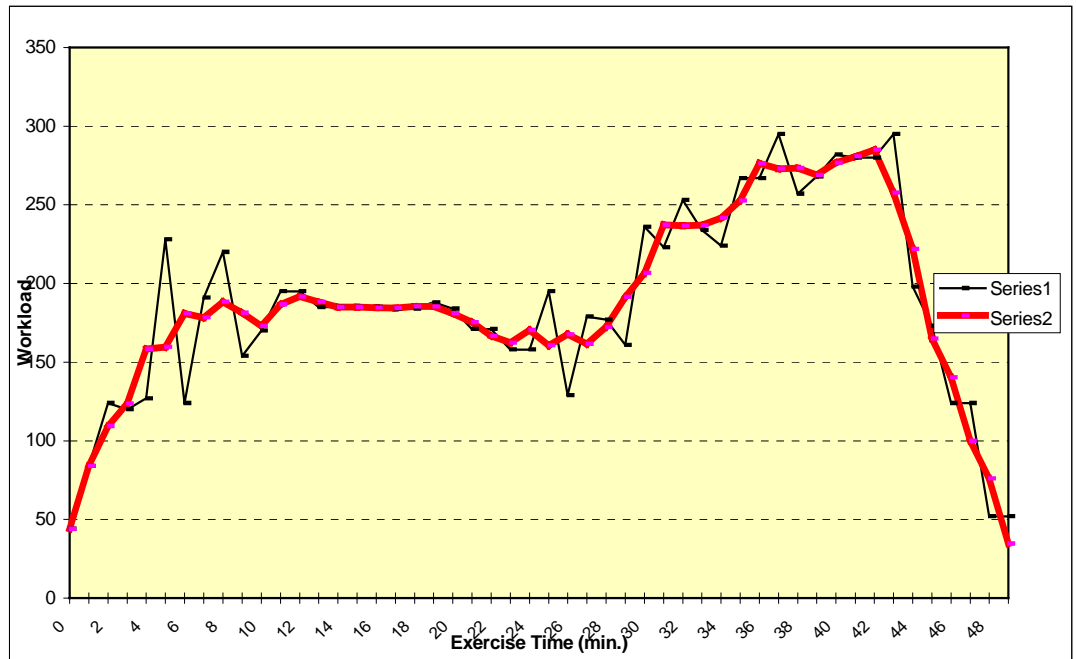


Figure 4: Exercise Workload

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**ANNEX D: TRAINING EVENTS TYPES**

**1. LIST OF MAIN TRAINING EVENTS USED IN THIS TRAINING**

<b>TRAINING EVENT NAME</b>	<b>Type</b>	<b>Method</b>	<b>Media</b>	<b>Rate</b>	<b>Mode</b>
Cases		Cases	MMC or TXT Or VIS	RSTD	ITMD Or GTMD
CBPE		Lesson	VIS	RSTD	GTMD
CBT	Guided and self Or Guided and RSTD Or Explorative	Inter	MMC	Self	ITMD
Lesson		Lesson	TXT Or MMC	Self Or RSTD	ITMD Or GMD
PTP	PTP	Pre Simul	PTT	RSTD	ITMD
SA	SA	Pre Simul	OTD	Self	ITMD
STBF	Structured briefing	Brief	VIS	RSTD	GTMD
Simul	Indiv	SIMUL	SIM Or HI FI SIM	REAL	ITMD
Simul	Team	SIMUL	SIM Or HI FI SIM	REAL	ITMD
Simul	Group	SIMUL	SIM Or HI FI SIM	REAL	GTMD
Visit	Visit	Sup. Pract.	Real	RSTD	GTMD Or ITMD

## **2. DEFINITIONS OF TRAINING EVENTS**

For more details the reader will refer to the reference document 'Specifications on Training Methods and Tools' (EATMP, 2000b).

### **2.1 Mode of Delivery, Media, Learning Rate and Training Techniques**

#### **2.1.1 Introduction**

As explained in the definition of training event, our methodology to design training strategy is based on the answers to the following questions:

- Is the training individual or in group? (Mode of delivery)
- Is the learning rate free or restricted or real? (Learning rate)
- Which media is used to carry the training message? (Media)
- What are the relations between the matter, the student and the instructor? (Training technique)

To use the methodology the training designer will first try to find the appropriate training event type within the existing list. If not found a thought should be given to the possibility that the same type could be used with a local different denomination: the four parameters should help to sort this out.

If this is not the case the additional training event type should be characterised by its four parameters.

#### **2.1.2 Mode of Delivery**

##### Individualised Training

Features of the individualised training are the provision of possibly different stimuli to each student, the separated analysis of their response and the provision of consequent new stimuli independent of the answers of other students.

Note: Instruction of a small group of students considered as an entity (for example planner and executive) is classed as individualised training. In ATC training this consideration of team building and the operational conditions very often imply that the 'learner' is a 'team' rather than an individual.

A team is:

*... a group of two or more persons who interact dynamically and interdependently within assigned specific roles, functions and responsibilities. They have to adapt continuously to each other to ensure the establishment of a safe, orderly and expeditious flow of traffic.*

There is of course an apparent contradiction between the terms 'individualised' and 'team interaction'. This has to be understood by differentiation between 'team' and 'group'.

A typical example is a radar simulation, in area radar control, provided to twelve students, working in six teams of two (planner plus executive) on six control positions simulating the same airspace sector.

Even if the proposed air traffic is the same for the six teams and even if the training objectives are the same, the simulations will progress differently for each of the teams. In addition, the simulations are not necessarily happening at the same time. This is not 'group' training. It might be considered as 'small-group training' if the teams were always composed of the same students. Generally, this is not the case: in fact, most of the training is addressed to each individual who has to cope with a very close and very complex element (his partner in the team) among other more distant elements (other sectors, units, aircraft, etc.). The fact that each partner sometimes reacts differently increases the individualisation of the training because none of the students can be confronted with the same situation.

#### Group Training

All the participants are presented the same learning material under the same conditions.

### **2.1.3 Media**

Media is the physical means by which an instructor or a training designer communicates a message. One media can use several supports (for instance, a Multimedia Computer (MMC) could use a diskette or CD-ROM). In this document we are going to define the media related to simulation but shall not attempt to make an exhaustive list of the many types of support and educational materials.

#### ***Real Equipment***

Either used in operational conditions (On-the-Job Training [OJT]) or in non-operational conditions (shadowing or demonstration).

**HI FI SIM: *High-fidelity Simulator***

A full size replica of Controller Work Positions (CWPs) including all equipment and computer programmes necessary to represent full tasks of the sector or the tower and their environment. A spare operational position used as simulator is a good example of HI FI SIM. In the case of aerodrome it includes an out-of-the-tower view.

**SIM: *Simulator***

A device that presents the student with a representation of the important features of the real situation and reproduces the operational conditions under which the student can practise real-time tasks directly.

**PTT: *Part-Task Trainer***

A training machine for the student to practise some operational functions independently of other functions which are not represented there, although they are necessarily associated to the first ones in the operational task.

**OTD: *Other Training Device***

A training machine which presents the student with some operational functions on a non-realistic reproduction of the operational devices. It includes a generic MMC.

**MMC: *Multimedia Computer***

A (networked or stand-alone) multimedia computer or workstation dedicated to one student or to a small cell. The hardware is off-the-shelf and has not been deeply modified for specific ATC purposes.

**AV: *Audiovisual aids***

The generation, recording, storage and reproduction of visual animated images and associated sounds (video, films and other).

**VIS: *Visual aids***

Aids to communication which utilise the sense of sight such as computer-based presentation, slides, overheads or view foils, mock-up and models. Very often, a LCD projector enables to display the images from some multimedia computers to a classroom group.

**AUD: *Audio aids***

Aids to communication that utilise the sense of hearing.

**TXT: *Text***

The provision of written documents including handouts, books, manuals, training documents, etc.

**2.1.4 Learning Rate**

**Self: *Self-paced learning***

A learning/teaching system whereby the learner is able to control the pace at which he/she works.

**RSTD: *Time-restricted learning***

A learning/teaching system whereby the course developer or the instructor controls the pace at which the learner has to work.

**Real: *Real Time***

A learning/teaching system whereby the pace at which the learner has to work is the same than in real operation.

**2.1.5 Training Techniques**

**Lect.: *Lecture***

A straight talk or exposition, possibly using visual or other aids, but without group participation other than questions, usually at the conclusion.

**Lesson: *Lesson/Demonstration***

A training technique incorporating a number of instructional techniques designed to ensure the participation of the students in reaching the specified behavioural objectives. The instructor is able to ascertain whether material is being assimilated.

**Cases: *Case Study***

A technique in which a real or fictional situation or series of events are presented to trainees for their analysis and consideration of possible solutions or problems identified. Their findings in a real situation can be compared with what actually occurred.

**Sup. Pract.: *Supervised Practices***

Manipulations of equipment where the instructor provides the necessary feedback.

**Interactive: *Interactive Training***

The provision of knowledge and skills by means of a computer with numerous interactions, student response analysis and allowing when appropriate free individual rhythm of learning (self-paced manner).

**Pre Simul: *Pre-simulation***

It allows to practice in restricted or in real time a part of the skills necessary for the operational task in a possibly not realistic environment (2D aerodrome for instance).

**SIMUL: *Simulation***

The provision of knowledge, skills and attitudes by means of a representation of air traffic responding to any student action as real air traffic. It always includes briefing, tutoring and debriefing.

**Role: *Role Play***

Students act out a working model of some real-world human situation in interacting group. They are provided with background data and roles to play together with constraints which may change as the play proceeds.

**STBF: *Structured Briefing***

Planned group introduction for a simulation (or a series of simulations) stating the objectives of the exercise, the simulated operational procedures, the operation of the simulator, the expected role of each team member, including the instructor, and possibly demonstrations of simulation exercises.

**Brief: *Briefing***

Briefing is an introduction for a training event during which interruption of the student's activity is not normally anticipated (e.g. OJT and simulation). The technique is used during the simulation (briefing/debriefing) or planned separately (structured briefing / structured debriefing).

**STDF: *Structured Debriefing***

Planned group review and discussion of the outcome of a simulation (or a series of simulations). The discussion is centred on the strategies chosen and their results.

**Debrief: *Debriefing***

Debriefing is a review and discussion on the outcome of a training event based on a formative assessment of that event. The technique is used



during the simulation (briefing/debriefing) or planned separately (structured briefing / structured debriefing).

### **Tutoring**

The act of giving additional knowledge and guidance to an individual or small group of trainees in an off-the-job, informal training situation. Tutoring is considered as a supplementary training event and may be automated in the case of guided simulation.

## **2.2 Simulations and Simulators**

### **2.2.1 Definitions**

The process is to consider a model of communication where the learner, either **individually** or **in group** receives information through a **media** at a **rate** according to a **training technique**. The combination of these elements defines the training event. In this report the training technique is always simulation.

#### **2.2.1.1 Media**

For our concern, we use five media: Real (Real equipment), HI FI SIM (High-fidelity Simulator), SIM (Simulator), PTT (Part-Task Trainer) and OTD (Other Training Device)

#### **2.2.1.2 Rate of Learning**

We might use any of the three rates of learning (SELF, RSTD, REAL) although most of our exercises will be in real time.

#### **2.2.1.3 Training Technique**

The training techniques to be used are simulation and pre-simulation but, due to the importance of simulation and its extensive use, we have defined several **types of simulation** and we have added the notion of guidance.

- **SIMUL: Simulation**

The Provision of knowledge, skills and attitudes by means of a representation of air traffic responding to any student action as real air traffic. Simulation always includes briefing, tutoring and debriefing.

### **2.2.2 Types of Simulations**

- **IND SIMUL: Individual Simulation**

Real-time full-task simulation involving one single student.

- **TEAM SIMUL: Team Simulation**

Real-time full-task simulation involving an individualised cell made of several students. A team consists of two or more students who are required to work together on related or interacting tasks.

- **GROUP SIMUL: Group Simulation**

Real-time full-task simulation involving several individual or team simulations simultaneously.

### 2.2.3 Types of Pre-simulations

- **SA: Skill Acquisition**

It allows self-pace, restricted or real-time practice of a part of the skills necessary for the operational task in a possibly non-realistic environment (e.g. 2-D aerodrome).

- **PTP: Part-Task Practice**

It allows restricted or real time practice of a part of the skills which are necessary for the operational task in a realistic environment (PTT or SIM).

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## ABBREVIATIONS AND ACRONYMS

For the purposes of this document the following abbreviations and acronyms shall apply:

2-D	Two dimensional
3-D	Three dimensional
a/c	aircraft
ACC	Area Control Centre
ACFT	Aircraft
ACN	Aircraft Classification Number
ACS	Area Control Surveillance
ADC	Aerodrome Control
ADF	Automatic Direction Finding Equipment
AFIL	Air-Filed Flight Plan
AFIS	Aerodrome Flight Information Service
AFTN	Aeronautical Fixed Telecommunications Network
AGA	Aerodromes (air routes and ground aids)
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
ANS	Air Navigation Services
APP	Approach Control
APS	Approach Control Surveillance
ASDA	Accelerate-Stop Distance Available
ASM	Airspace Management
ATA	Actual Time of Arrival
ATC	Air Traffic Control
ATCO	Air Traffic Controller / Air Traffic Control Officer (US/UK)
ATD	Actual Time of Departure

ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATS	Air Traffic Services
AUD	Audio aids
AV	Audiovisual aids
AVASI	Abbreviated Visual Approach Slope Indicator
BIRDTAM	BIRD hazard noTAM
Brief	Briefing
Cases	Case Study
CAT	Clear Air Turbulence
CBPE	Computer-Based Projected Exercise
CBT	Computer-Based Training
CISM	Critical Stress Incident Management
COP	Co-ordination Point
CWP	Controller Work Position
Debrief	Debriefing
DEGS	Degraded Systems Capability
DG7	Drafting Group 7 ( <i>EATCHIP, HUM, HRT, TSG, TF-CCC</i> )
DIS	Director(ate) Infrastructure, ATC Systems & Support ( <i>EUROCONTROL Headquarters, SDE</i> )
DIS/HUM	See 'HUM (Unit)'
DME	Distance Measuring Equipment
DVOR	Doppler VOR
E	East
EAT	Expected Approach Time
EATCHIP	European Air Traffic Control Harmonisation and Integration Programme ( <i>now EATMP</i> )
EATMP	European Air Traffic Management Programme ( <i>formerly EATCHIP</i> )

ECAC	European Civil Aviation Conference
EET	Estimated Elapsed Time
EFIS	Electronic Flight Instrument System
EQPM	Equipment and systems
ESARR	EUROCONTROL Safety Regulatory Requirement
ET	Executive Task ( <i>EATCHIP</i> )
ETD	Estimated Time of Departure
EUROCONTROL	European Organisation for the Safety of Air Navigation
FDPS	Flight Data Processing System
FIR	Flight Information Region
FIS	Flight Information Service
FL	Flight Level
FMS	Flight Management System
FPL	(Filed) Flight Plan
FUA	Flexible Use of Airspace
GLONASS	Global Navigation Satellite System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
GROUP SIMUL	Group Simulation
GSIMUL	Guided Simulation
GTMD	Group Training Material Dependent
GUI	Guidelines ( <i>EATCHIP/EATMP</i> )
HF	High Frequency
HI FI SIM	High-Fidelity Simulator
HRS	Human Resources Programme ( <i>EATMP, HUM</i> )
HRT	Human Resources Team ( <i>EACHIP/EATMP, HUM</i> )
HUM	Human Factors
HUM	Human Resources (Domain) ( <i>EATCHIP/EATMP</i> )

HUM Unit	Human Factors and Manpower Unit ( <i>EUROCONTROL Headquarters, SDE, DIS; formerly know as the 'ATM Human Resources Unit'; also known as DIS/HUM</i> )
IANS	Institute of Air Navigation Services ( <i>EUROCONTROL, Luxembourg</i> )
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organization ( <i>US</i> )
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IND SIMUL	Individual Simulation
Interactive	Interactive Training
INTR	Introduction to the course
ITMD	Individual Training Material Dependent
KT	Knot(s)
LAW	Aviation Law
LDA	Landing Distance Available
Lect.	Lecture
LOA	Letter Of Agreement
LVP	Low Visibility Procedure
MASPS	Minimum Aircraft Systems Performance Specifications
MAS UAC	Maastricht Upper Area Control Centre ( <i>EUROCONTROL, The Netherlands</i> )
MAXLOAD	Maximum Load
MET	Meteorology
Min.	Minute
MLS	Microwave Landing System
MMC	MultiMedia Computer
MSA	Minimum Sector Altitude
MTCD	Medium-Term Conflict Detection
N	North
NAV	Navigation



NAVAID	Navigation(al) Aid
NDB	Non-Directional Beacon
NM	Nautical Mile(s)
NOTAM	Notice to Airmen
NPR	Noise Preferential Route
OJT	On-The-Job-Training
OLDI	On-Line Data Interchange
OTD	Other Training Device
PAPI	Precision Approach Path Indicator
PCN	Pavement Classification Number
PENV	Professional Environment
Pre Simul	Pre-simulation
Proj	Projector
PSR	Primary Surveillance Radar
PST	Pacific Standard Time
PTP	Part-Task Practice
PTT	Part-Task Trainer
RAD	Radar
RCC	Rescue Co-ordination Centre
RDPS	Radar Data Processing System
REAL	Real time
RNAV	Area Navigation
Role	Role Play
RPL	Repetitive Flight Plan
RPS	Radar Position Symbol
RSTD	Time-Restricted learning
RTF	Radiotelephone or Radiotelephony
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RX	Receiver

S	South
SA	Skill Acquisition
SDE	Senior Director, Principal EATMP Directorate <i>or, in short, Senior Director(ate) EATMP (EUROCONTROL Headquarters)</i>
SELCAL	Selective Calling System
SELF	Self-paced learning
SEQ	Sequencing
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
SIM	Simulator
SIMUL	Simulation
SNOWTAM	NoTAM on SNOW conditions
SPD	Speed
SRC	Safety Regulation Commission ( <i>EUROCONTROL</i> )
SSR	Secondary Surveillance Radar
ST	Specialist Task ( <i>EATCHIP</i> )
STAR	Standard Arrival Route
STBF	Structured Briefing
STD	Standard ( <i>EATCHIP/EATMP</i> )
STDF	Structured Debriefing
Sup. Pract.	Supervised Practices
TA	Transition Altitude
TACAN	UHF Tactical Air Navigation Aid
TAF	Terminal Area Forecast
TCAS	Traffic Alert and Collision-Avoidance System
TCL	Terminal Control
TDH Unit	Training Development and Harmonisation Unit ( <i>EUROCONTROL, IANS</i> )
TEAM SIMUL	Team Simulation

TF-CCC	Task Force Common Core Content ( <i>EATCHIP, HUM, HRT, TSG</i> )
TMA	Terminal Area
TODA	Take-Off Distance Available
TORA	Take-Off Run Available
TRL	Transition Level
TRM	Team Resource Management
TSG	Training Sub-Group ( <i>EATCHIP/EATMP, HUM, HRT</i> )
TSP	Training Sub-Programme ( <i>EATMP, HUM, HRS</i> )
TWR	Tower
TX	Transmitter
TXT	Text
UAC	Upper Area Control Centre
UDF	UHF Direction Finding Station
UHF	Ultra High Frequency
UIR	Upper Flight Information Region
UNIN	Unusual/Emergency Situations
UNKN	Unknown
VASI	Visual Approach Slope Indicator
VDF	VHF Direction Finding Station
VEC	Vectoring
VFR	Visual Flight Rules
VHF	Very High Frequency
VIP	Very Important Person
VIS	Visual aids
VOLMET	Meteorological Information for Aircraft in Flight
VOR	VHF Omnidirectional Radio Range
VORTAC	VOR and TACAN combination
W	West
WIND	Wind effect

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