Civil Aviation Technical Standards

Relating to

PART 172 – ATS

APPENDICES

APPENDIX 1 PRINCIPLES GOVERNING THE IDENTIFICATION OF NAVIGATION SPECIFICATIONS AND THE IDENTIFICATION OF ATS ROUTES OTHER THAN STANDARD DEPARTURE AND ARRIVAL ROUTES

***Compliance Note 1**: This Appendix prescribes guidelines for identification of navigation specifications and ATS routes in order to comply with the requirements of this Part 172. This Appendix does not include identification of standard departure and arrival routes and associated procedures.*

***Compliance Note 2**. See Appendix 3 concerning the identification of standard departure and arrival routes and associated procedures. Guidance material on the establishment of these routes and procedures is contained in the Air Traffic Services Planning Manual (Doc 9426).*

1. Designators for ATS routes and navigation specifications

1.1 The purpose of a system of route designators and navigation specification(s) applicable to specified ATS route segment(s), route(s) or area is to allow both pilots and ATS, taking into account automation requirements, to:

a) make unambiguous reference to any ATS route without the need to resort to the use of geographical coordinates or other means in order to describe it;

b) relate an ATS route to a specific vertical structure of the airspace, as applicable;

c) indicate a required level of navigation performance accuracy, when operating along an ATS route or within a specified area; and

d) indicate that a route is used primarily or exclusively by certain types of aircraft.

***Compliance Note 1:** Specifications concerning the publication of navigation specifications are given in Part 175, Sub-Part 175.09 and PANS-AIM (Doc 10066), Appendix 2.*

Compliance Note 2: *In relation to this Appendix and for flight planning purposes, a prescribed navigation specification is not considered an integral part of the ATS route designator.*

1.2 In order to meet the purpose of this Appendix, the designation system must:

a) permit the identification of any ATS route in a simple and unique manner;

b) avoid redundancy;

c) be usable by both ground and airborne automation systems;

d) permit utmost brevity in operational use; and

e) provide sufficient possibility of extension to cater for any future requirements without the need for fundamental changes.

1.3 Controlled, advisory and uncontrolled ATS routes, with the exception of standard arrival and departure routes, must therefore be identified as specified hereafter.

2. Composition of designator

2.1 The ATS route designator must consist of a basic designator supplemented, if necessary, by:

a) one prefix as prescribed in 2.3; and

b) one additional letter as prescribed in 2.4.

2.1.1 The number of characters required to compose the designator may not exceed six characters.

2.1.2 The number of characters required to compose the designator must, whenever possible, be kept to a maximum of five characters.

2.2 The basic designator must consist of one letter of the alphabet followed by a number from 1 to 999.

2.2.1 Selection of the letter must be made from those listed hereunder:

a) A, B, G, R for routes which form part of the regional networks of ATS routes and are not area navigation routes;

b) L, M, N, P for area navigation routes which form part of the regional networks of ATS routes;

c) H, J, V, W for routes which do not form part of the regional networks of ATS routes and are not area navigation routes;

d) Q, T, Y, Z for area navigation routes which do not form part of the regional networks of ATS routes.

2.3 Where applicable, one supplementary letter must be added as a prefix to the basic designator in accordance with the following:

a) K to indicate a low-level route established for use primarily by helicopters;

b) U to indicate that the route or portion thereof is established in the upper airspace;

c) S to indicate a route established exclusively for use by supersonic aircraft during acceleration, deceleration and while in supersonic flight.

2.4 When prescribed by the appropriate ATS authority or on the basis of regional air navigation agreements, a supplementary letter may be added after the basic designator of the ATS route in question in order to indicate the type of service provided in accordance with the following:

a) the letter F to indicate that on the route or portion thereof advisory service only is provided;

b) the letter G to indicate that on the route or portion thereof flight information service only is provided.

***Compliance Note 1**: Due to limitations in the display equipment on board aircraft, the supplementary letters "F" or "G" may not be displayed to the pilot.*

***Compliance Note 2**. Implementation of a route or a portion thereof as controlled route, advisory route or flight information route is indicated in aeronautical charts and aeronautical information publications in accordance with the provisions in NAMCAR/NAM/CATS Part 175.*

3. Assignment of basic designators

3.1 Basic ATS route designators must be assigned in accordance with the following principles.

3.1.1 The same basic designator must be assigned to a main trunk route throughout its entire length, irrespective of terminal control areas, State or regions traversed.

Compliance Note: *This is of particular importance where automated ATS data processing and computerized airborne navigation equipment is used.*

3.1.2 Where two or more trunk routes have a common segment, the segment in question must be assigned each of the designators of the routes concerned, except where this would present difficulties in the provision of air traffic service, in which case, by common agreement, one designator only may be assigned.

3.1.3 A basic designator assigned to one route not be assigned to any other route.

3.1.4 The State's requirements for designators must be notified to the Regional Office of ICAO for coordination.

4. Use of designators in communications

4.1 In printed communications, the designator must be expressed at all times by not less than two and not more than six characters.

4.2 In voice communications, the basic letter of a designator must be spoken in accordance with the ICAO spelling alphabet.

4.3 Where the prefixes K, U or S specified in 2.3 are used, they must, in voice communications, be spoken as follows:

K — KOPTER

U — UPPER

S — SUPERSONIC

The word “kopter” must be pronounced as in the word “helicopter” and the words “upper” and “supersonic” as in the English language.

4.4 Where the letters “F” or “G” specified in 3.4 are used, the flight crew must not be required to use them in voice communications.

APPENDIX 2 PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

***Compliance Note**. This Appendix prescribes principles governing the establishment and identification of significant points in order to comply with the requirements of this Part 172. This Appendix does not include identification of identification of standard departure and arrival routes.*

1. Establishment of significant points

1.1 Significant points must, whenever possible, be established with reference to ground-based radio navigation aids, preferably VHF or higher frequency aids.

1.2 Where such ground-based radio navigation aids do not exist, significant points must be established at locations which can be determined by self-contained airborne navigation aids, or, where navigation by visual reference to the ground is to be effected, by visual observation. Specific points may be designated as ‘‘transfer of control’’ points by agreement between adjacent air traffic control units or control positions concerned.

2. Designators for significant points marked by the site of a radio navigation aid

2.1 Plain language name for significant points marked by the site of a radio navigation aid

2.1.1 Whenever practicable, significant points must be named with reference to an identifiable and preferably prominent geographical location.

2.1.2 In selecting a name for the significant point, care must be taken to ensure that the following conditions are met:

a) the name must not create difficulties in pronunciation for pilots or ATS personnel when speaking in the language used in ATS communications. Where the name of a geographical location in the national language selected for designating a significant point gives rise to difficulties in pronunciation, an abbreviated or contracted version of this name, which retains as much of its geographical significance as possible, must be selected;

Example: FUERSTENFELDBRUCK = FURSTY

b) the name must be easily recognizable in voice communications and must be free of ambiguity with those of other significant points in the same general area. In addition, the name must not create confusion with respect to other communications exchanged between air traffic services and pilots;

c) the name must, if possible, consist of at least six letters and form two syllables and preferably not more than three;

d) the selected name must be the same for both the significant point and the radio navigation aid marking it.

2.2 Composition of coded designators for significant points marked by the site of a radio navigation aid

2.2.1 The coded designator must be the same as the radio identification of the radio navigation aid. It must be so composed, if possible, as to facilitate association with the name of the point in plain language.

2.2.2 Coded designators must not be duplicated within 1 100 km (600 NM) of the location of the radio navigation aid concerned, except as noted hereunder.

Compliance Note*: When two radio navigation aids operating in different bands of the frequency spectrum are situated at the same location, their radio identifications are normally the same.*

2.3 The requirements for coded designators must be notified to the ICAO Regional Office for coordination.

3. Designators for significant points not marked by the site of a radio navigation aid

3.1 Where a significant point is required at a position not marked by the site of a radio navigation aid, and is used for ATC purposes, it must be designated by a unique five-letter pronounceable "name-code". This name-code designator then serves as the name as well as the coded designator of the significant point.

Compliance Note: *The principles governing the use of alphanumeric name-codes in support of RNAV SIDs, STARs and instrument approach procedures are detailed in PANS-OPS (ICAO Doc 8168).*

3.2 The name-code designator must be selected so as to avoid any difficulties in pronunciation by pilots or ATS personnel when speaking in the language used in ATS communications.

Examples: ADOLA, KODAP

3.3 The name-code designator must be easily recognizable in voice communications and must be free of ambiguity with those used for other significant points in the same general area.

3.4 The unique five-letter pronounceable name-code designator assigned to a significant point may not be assigned to any other significant point. When there is a need to relocate a significant point, a new name-code designator must be chosen. In cases when the ANSP wishes to keep the allocation of specific name-codes for re-use at a different location, such name-codes may not be used until after a period of at least six months.

3.5 The requirements for name-code designators must be notified to the Regional Offices of ICAO for coordination.

3.6 In areas where no system of fixed routes is established or where the routes followed by aircraft vary depending on operational considerations, significant points must be determined and reported in terms of World Geodetic System — 1984 (WGS-84) geographical coordinates, except that permanently established significant points serving as exit and/or entry points into such areas must be designated in accordance with the applicable provisions in 2 or 3.

4. Use of designators in communications

4.1 Normally the name selected in accordance with 2 or 3 must be used to refer to the significant point in voice communications. If the plain language name for a significant point marked by the site of a radio navigation aid selected in accordance with 2.1 is not used, it must be replaced by the coded designator which, in voice communications, must be spoken in accordance with the ICAO spelling alphabet.

4.2 In printed and coded communications, only the coded designator or the selected name-code may be used to refer to a significant point.

5. Significant points used for reporting purposes

5.1 In order to permit ATS to obtain information regarding the progress of aircraft in flight, selected significant points may need to be designated as reporting points.

5.2 In establishing such points, consideration must be given to the following factors:

a) the type of air traffic services provided;

b) the amount of traffic normally encountered;

c) the accuracy with which aircraft are capable of adhering to the current flight plan;

d) the speed of the aircraft;

e) the separation minima applied;

f) the complexity of the airspace structure;

g) the control method(s) employed;

h) the start or end of significant phases of a flight, (climb, descent, change of direction, etc.);

i) transfer of control procedures;

j) safety and search and rescue aspects;

k) the cockpit and air-ground communication workload.

5.3 Reporting points must be established either as “compulsory” or as “on-request”.

5.4 In establishing “compulsory” reporting points the following principles apply:

a) compulsory reporting points must be limited to the minimum necessary for the routine provision of information to air traffic services units on the progress of aircraft in flight, bearing in mind the need to keep cockpit and controller workload and air-ground communications load to a minimum;

b) the availability of a radio navigation aid at a location may not necessarily determine its designation as a compulsory reporting point;

c) compulsory reporting points may not necessarily be established at flight information region or control area boundaries.

5.5 “On-request” reporting points may be established in relation to the requirements of air traffic services for additional position reports when traffic conditions so demand.

5.6 The designation of compulsory and on-request reporting points must be reviewed regularly with a view to keeping the requirements for routine position reporting to the minimum necessary to ensure efficient air traffic services.

5.7 Routine reporting over compulsory reporting points may not systematically be made mandatory for all flights in all circumstances. In applying this principle, particular attention must be given to the following:

a) high-speed, high-flying aircraft must not be required to make routine position reports over all reporting points established as compulsory for low-speed, low-flying aircraft;

b) aircraft transiting through a terminal control area must not be required to make routine position reports as frequently as arriving and departing aircraft.

5.8 In areas where the above principles regarding the establishment of reporting points would not be practicable, a reporting system with reference to meridians of longitude or parallels of latitude expressed in whole degrees may be established.

APPENDIX 3 PRINCIPLES GOVERNING THE IDENTIFICATION OF STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES

Compliance Note 1. *The ANS provider is required under this Part 172 to identify standard departure and arrival routes. This Appendix prescribes the principles governing identification of standard departure and arrival routes in order to comply with this Part.*

Compliance Note 2*. Material relating to the establishment of standard departure and arrival routes and associated procedures is contained in the Air Traffic Services Planning Manual (Doc 9426)*

1. Designators for standard departure and arrival routes and associated procedures

1.1 The system of designators must:

a) permit the identification of each route in a simple and unambiguous manner;

b) make a clear distinction between:

(i) departure routes and arrival routes;

(ii) departure or arrival routes and other ATS routes;

(iii) routes requiring navigation by reference to ground-based radio aids or self-contained airborne aids, and routes requiring navigation by visual reference to the ground;

c) be compatible with ATS and aircraft data processing and display requirements;

d) be of utmost brevity in its operational application;

e) avoid redundancy;

f) provide sufficient possibility for extension to cater for any future requirements without the need for fundamental changes.

1.2 Each route must be identified by a plain language designator and a corresponding coded designator.

1.3 The designators must, in voice communications, be easily recognizable as relating to a standard departure or arrival route and must not create any difficulties in pronunciation for pilots and ATS personnel.

2. Composition of designators

2.1 Plain language designator

2.1.1 The plain language designator of a standard departure or arrival route must consist of:

a) a basic indicator; followed by
b) a validity indicator; followed by
c) a route indicator, where required; followed by
d) the word “departure” or “arrival”; followed by
e) the word “visual”, if the route has been established for use by aircraft operating in accordance with the visual flight rules (VFR).

2.1.2 The basic indicator must be the name or name-code of the significant point where a standard departure route terminates or a standard arrival route begins.

2.1.3 The validity indicator must be a number from 1 to 9.

2.1.4 The route indicator must be one letter of the alphabet. The letters “I” and “O” may not be used.

2.2 Coded designator

The coded designator of a standard departure or arrival route, instrument or visual, must consist of:

a) the coded designator or name-code of the significant point described in 2.1.1 a); followed by
b) the validity indicator in 2.1.1 b); followed by
c) the route indicator in 2.1.1 c), where required.

***Compliance Note**: Limitations in the display equipment on board aircraft may require shortening of the basic indicator, if that indicator is a five-letter name-code, e.g. KODAP. The manner in which such an indicator is shortened is left to the discretion of operators.*

3. Assignment of designators

3.1 Each route must be assigned a separate designator.

3.2 To distinguish between two or more routes which relate to the same significant point (and therefore are assigned the same basic indicator), a separate route indicator as described in 2.1.4 must be assigned to each route.

4. Assignment of validity indicators

4.1 A validity indicator must be assigned to each route to identify the route which is currently in effect.

4.2 The first validity indicator to be assigned must be the number "1".

4.3 Whenever a route is amended, a new validity indicator, consisting of the next higher number, must be assigned. The number "9" must be followed by the number "1".

5. Examples of plain language and coded designators

5.1 Example 1: Standard departure route — instrument:

a) Plain language designator: BRECON ONE DEPARTURE

b) Coded designator: BCN 1

5.1.1 *Meaning*: The designator identifies a standard instrument departure route which terminates at the significant point BRECON (basic indicator). BRECON is a radio navigation facility with the identification BCN (basic indicator of the coded designator). The validity indicator ONE (1 in the coded designator) signifies either that the original version of the route is still in effect or that a change has been made from the previous version NINE (9) to the now effective version ONE (1) (see 4.3). The absence of a route indicator (see 2.1.4 and 3.2) signifies that only one route, in this case a departure route, has been established with reference to BRECON.

5.2 Example 2: Standard arrival route — instrument:

a) Plain language designator: KODAP TWO ALPHA ARRIVAL

b) Coded designator: KODAP 2 A

5.2.1 *Meaning*: This designator identifies a standard instrument arrival route which begins at the significant point KODAP (basic indicator). KODAP is a significant point not marked by the site of a radio navigation facility and therefore assigned a five-letter name-code in accordance with Appendix 2. The validity indicator TWO (2) signifies that a change has been made from the previous version ONE (1) to the now effective version TWO (2). The route indicator ALPHA (A) identifies one of several routes established with reference to KODAP and is a specific character assigned to this route.

5.3 *Example 3*: Standard departure route — visual:

a) Plain language designator ADOLA FIVE BRAVO DEPARTURE VISUAL

b) Coded designator: ADOLA 5 B

5.3.1 *Meaning*: This designator identifies a standard departure route for controlled VFR flights which terminates at ADOLA, a significant point not marked by the site of a radio navigation facility. The validity indicator FIVE (5) signifies that a change has been made from the previous version

FOUR (4) to the now effective version FIVE (5). The route indicator BRAVO (B) identifies one of several routes established with reference to ADOLA.

6. Composition of designators for MLS/RNAV approach procedures

6.1 Plain language designator

6.1.1 The plain language designator of an MLS/RNAV approach procedure must consist of:

a) "MLS"; followed by
b) a basic indicator; followed by
c) a validity indicator; followed by
d) a route indicator; followed by
e) the word "approach"; followed by
f) the designator of the runway for which the procedure is designed.

6.1.2 The basic indicator must be the name or name-code of the significant point where the approach procedure begins.

6.1.3 The validity indicator must be a number from 1 to 9.

6.1.4 The route indicator must be one letter of the alphabet. The letters "I" and "O" may not be used.

6.1.5 The designator of the runway must be in accordance with the aerodromes regulations

6.2 Coded designator

6.2.1 The coded designator of an MLS/RNAV approach procedure must consist of:

a) "MLS"; followed by
b) the coded designator or name-code of the significant point described in 6.1.1 b); followed by
c) the validity indicator in 6.1.1 c); followed by
d) the route indicator in 6.1.1 d); followed by

e) the runway designator in 6.1.1 f).

6.3 Assignment of designators

6.3.1 The assignment of designators for MLS/RNAV approach procedures must be in accordance with paragraph 4. Procedures having identical tracks but different flight profiles must be assigned separate route indicators.

6.3.2 The route indicator letter for MLS/RNAV approach procedures must be assigned uniquely to all approaches at an airport until all the letters have been used. Only then may the route indicator letter be repeated. The use of the same route indicator for two routes using the same MLS ground facility is not permitted.

6.3.3 The assignment of validity indicator for approach procedures must be in accordance with paragraph 4.

6.4 Example of plain language and coded designators

6.4.1 *Example:*

a) Plain language designator: MLS HAPPY ONE ALPHA APPROACH RUNWAY ONE EIGHT LEFT

b) Coded designator: MLS HAPPY 1 A 18L

6.4.2 *Meaning:* The designator identifies an MLS/RNAV approach procedure which begins at the significant point HAPPY (basic indicator). HAPPY is a significant point not marked by the site of a radio navigation facility and therefore assigned a five-letter name-code in accordance with Appendix 2. The validity indicator ONE (1) signifies that either the original version of the route is still in effect or a change has been made from the previous version NINE (9) to the now

effective version ONE (1). The route indicator ALPHA (A) identifies one of several routes established with reference to HAPPY and is a specific character assigned to this route.

7. Use of designators in communications

7.1 In voice communications, only the plain language designator may be used.

Compliance Note: For the purpose of identification of routes, the words "departure", "arrival" and "visual" described in 2.1.1 d) and 2.1.1 e) are considered to be an integral element of the plain language designator.

7.2 In printed or coded communications, only the coded designator may be used.

8. Display of routes and procedures to air traffic control

8.1 A detailed description of each currently effective standard departure and/or arrival route/approach procedure, including the plain language designator and the coded designator, must be displayed at the working positions at which the routes/procedures are assigned to aircraft as part of an ATC clearance, or are otherwise of relevance in the provision of air traffic control services.

8.2 Whenever possible, a graphic portrayal of the routes/ procedures must also be displayed.

APPENDIX 4 ATS AIRSPACE CLASSES — SERVICES PROVIDED AND FLIGHT REQUIREMENTS

Class	*Type of flight*	*Separation provided*	*Service provided*	*Speed limitation**	*Radio communication requirement*	*Subject to an ATC clearance*
A	IFR only	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
B	IFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
	VFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
C	IFR	IFR from IFR IFR from VFR	Air traffic control service	Not applicable	Continuous two-way	Yes
	VFR	VFR from IFR	1) Air traffic control service for separation from IFR; 2) VFR/VFR traffic information (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
D	IFR	IFR from IFR	Air traffic control service, traffic information about VFR flights (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	IFR/VFR and VFR/VFR traffic information (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
E	IFR	IFR from IFR	Air traffic control service and, as far as practical, traffic information about VFR flights	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	Traffic information as far as practical	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
F	IFR	IFR from IFR as far as practical	Air traffic advisory service; flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
G	IFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No

* When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 should be used in lieu of 10 000 ft.

APPENDIX 5 ATS FACILITIES AND EQUIPMENT

1. General

1.1 This section sets out the operational requirements for equipment and facilities necessary for the provision of air traffic service.

1.2 An ATS provider must establish facilities that are appropriate to the air traffic services which they are required to provide, and that are listed in their Manual of Procedure, specifically:

(a) Aerodrome Control;

(b) Approach Control;

(c) Area Control;

(d) Flight Information Services; and

(e) dedicated training and assessment facilities.

1.3 Air Traffic Services under 1.2 (b), (c) and (d) may be provided from a shared facility.

2. Control Towers

Compliance Note: *The following requirements must be met for any new tower. For existing towers, an ATS provider must attempt to comply as far as is reasonably practicable with the requirements. Where it is not possible to comply, the ATS provider must provide a safety assessment of the impact of the deficiency.*

2.1 An ATS provider that provides an aerodrome control service must ensure that any control tower, including any temporary control tower, is constructed and situated to provide the maximum practicable visibility including:

(a) adequate visibility to all the manoeuvring areas and airspace which are under the controllers' area of responsibility;

(b) a view of all runway ends and taxiways, with suitable depth perception;

(c) maximum visibility of airborne traffic patterns with primary consideration given to the view from the aerodrome control position;

(d) unobstructed lines of sight from the control tower eye level to:

i. the manoeuvring area of the aerodrome;

ii. the runway approach lights;

iii. any fire routes service roads adjacent to the areas mentioned in (a) and (b) above;

iv. sections of aprons used as a taxiway;

(e) sufficient visual resolution of all aerodrome movement areas for which the controller has a responsibility;

(f) ability to detect movement of a departing aircraft as soon as possible after it has commenced its take-off run.

2.2 The control tower must be constructed to provide:

(a) protection from glare and reflection; and

(b) protection from noise.

2.3 The control tower must be safeguarded from any development that would affect the requirements of 2.1 and 2.2 above.

2.4 At locations where it is intended to operate control towers for any period of time with one controller, the tower must be provided with:

(a) toilet facilities that ensure the minimum possible interruption to, or degradation of, services; and

(b) storage and preparation facilities for food and drink in the visual control room.

2.5 Each control tower must be provided with equipment which will enable two-way voice communication with:

(a) any aircraft, in or adjacent to airspace for which the ATS provider has responsibility; and

(b) any aircraft, vehicle, and person, on, or adjacent to, the manoeuvring area.

2.6 Each control tower must be provided with the following minimum equipment:

(a) an appropriate power supply to service the facilities identified in this section;

(b) a display system or systems designed to show the disposition of current and pending aerodrome traffic together with ancillary information for individual aircraft;

***Compliance Note**: This may be effected by use of paper strip display boards, or similar.*

(c) appropriate and current maps and charts;

(d) binoculars;

(e) time display at each operational position meeting the appropriate requirements of this CATS;

(f) Log keeping system;

(g) Outside temperature indicator;

(h) Altimeter setting indicator meeting the appropriate requirements of this CATS;

(i) Signal lamp with green, red, and white functions;

(j) Telephone communications;

(k) Status monitors for approach and landing aids and any road or rail signalling equipment affecting the use of a runway;

(l) Visibility and cloud height checkpoints;

(m) Voice and, if applicable, data recording equipment meeting the appropriate requirements of this CATS;

(n) Wind direction and wind speed display. The display(s) must be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists. Where multiple sensor(s) are used, the displays to which they are related must be clearly marked to identify the runway and section of the runway monitored by each sensor;

(o) An audible emergency alerting system;

(p) An AFTN terminal or, if provided for in an ATS letter of agreement, an alternative means of reception and transmission of information normally conveyed by AFTN;

(q) If applicable, aerodrome lighting controls panel, including appropriate switching, monitors and controls for:

(i) runway lighting;

(ii) approach lighting;

(iii) high intensity approach and runway lighting;

(iv) taxiway lighting;

(v) PAPI;

(vi) obstruction lighting;

(vii) illuminated wind indicator; and

(viii) aerodrome beacon.

(r) Display for runway visual range (RVR) values when RVR values are measured by instrumental means. The display(s) must be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists; and

(s) At aerodromes where the height of cloud base is assessed by instrumental means the TWR must are equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays must be related to the same location(s) of observations and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.

2.7 A control tower must have a means to readily recognise the failure of any terrestrial navigation aid being used for the control of aircraft.

2.8 A control tower must have a means of ensuring that the ILS Glide Path is not radiating if the associated Localiser is not operating.

2.9 Where the tower is used only for the provision of an aerodrome flight information service the provisions of 2.1 to 2.6 may be adapted subject to an appropriate safety assessment.

3. Area and Approach Control Units

3.1 Area and Approach Control Units must incorporate the following facilities:

(a) an appropriate power supply to service the facilities identified in this section;

(b) a display system or systems designed to show the disposition of current and pending traffic, including a flight data display and an operational data display, together with ancillary information for individual aircraft;

(c) air/ground radiotelephony (RTF) and/or datalink communications equipment on assigned frequencies;

(d) ground/ground voice and/or datalink equipment to enable communication between adjacent air traffic service units including control towers and the parent area control centre or approach control unit;

(e) time display at each operational position meeting the appropriate requirements of this CATS;

(f) appropriate and current maps and charts;

(g) external communications including telephone;

(h) status monitors as appropriate for navigation, approach, and landing aids, including a means to readily recognise the failure of any terrestrial navigation aid used in providing separation to aircraft;

(i) voice and, where applicable, data recording equipment;

(j) AFTN terminal or other means to provide information normally conveyed by AFTN;

(k) log keeping system;

(l) for an approach control operating position, an ILS status monitor at the approach control or approach control radar operating position for the aerodrome concerned; and

(m) for an approach control operating position responsible for aircraft on final approach, or aircraft landing or taking off, a wind direction and wind speed display, an RVR display and a cloud height display fed from the same source as the corresponding equipment in the TWR.

4. Commissioning of New Facilities and Equipment

4.1 Any new facilities must be commissioned in accordance with procedures stated in the provider's Manual of Procedure.

4.2 The procedures must describe how the provider has determined that:

(a) the functional and performance requirements for the facility have been met; and

(b) all ATS operating procedures have been validated; and

(c) sufficient trained ATS personnel are available to operate the facility; and

(d) all support arrangements for the facilities, including any necessary agreements, are in place.

5. Communications Capabilities

5.1 Air-ground communications for ATS purposes must be provided through the use of radiotelephony and/or data link.

5.2 Where Required Communications Performance (RCP) types have been prescribed, ATS units must, in addition to the requirements specified in sub-section 3, be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP type(s).

5.3 An ATS provider must provide communications facilities in support of ATS that comply with the requirements prescribed in Part 172.

5.4 The level of reliability, availability and redundancy of communications systems must be such that the possibility of system failure, non-availability or significant degradation of performance is minimised. Adequate backup facilities must be provided.

5.5 An ATS provider must ensure that:

(a) all communication, navigation and surveillance equipment used by them in the provision of ATS is installed and maintained by an aeronautical telecommunication service provider who has been authorised under Part 171;

(b) instructions are issued in the ATS provider procedures manual prohibiting tampering or interfering with the normal operating status of equipment;

(c) instructions are issued in the ATS provider procedures manual which include the following procedures directed to unit personnel detecting an equipment malfunction:

(i) immediately report the malfunction to the maintenance personnel responsible for corrective action;

(ii) do not use the equipment if it is apparent that the malfunction could create a hazardous situation.

(d) procedures exist and are published in the ATS provider procedures manual directing unit personnel to coordinate release of equipment for routine maintenance with appropriate maintenance personnel.

5.6 An ATS provider must establish procedures to ensure that the aeronautical telecommunications equipment is operated in accordance with the requirements of Part 171.

5.7 An ATS provider must establish procedures to ensure that operational personnel check all backup radios, stand-alone transceivers and speed dial phones for functionality at regular intervals. These procedures must be published in their ATC procedures manual.

6. Visual Display Units

6.1 An ATS Provider must establish procedures to ensure that any visual display unit used in the provision of air traffic services is positioned with due regard to the relative importance of the information displayed and ease of use by the staff concerned.

6.2 An ATS provider must in its Manual of procedures, include a criteria for display of information and ensure that the displayed operational information is in accordance with the specified criteria.

6.3 An ATS provider must ensure that display equipment has a level of reliability, availability, and redundancy that minimizes the possibility of failure, non-availability, or significant degradation of performance.

7. Equipment Status Monitors

7.1 An ATS provider must establish procedures to ensure that equipment status monitors required by are fitted with:

(a) an aural signal to indicate a change of status; and

(b) a visual indication of the current status.

8. Temporary Towers

8.1 A temporary tower is not required to be provided with the equipment required under paragraphs 2.6(k), (p) and (q) if it is impracticable to do so and other appropriate measures are taken, as the case may be, to provide the person providing the air traffic service from the temporary tower with that information.

9 Recording of Voice and Surveillance Circuits

9.1 An ATS provider must ensure that all operational voice and surveillance circuits are recorded and the recorder monitor panel is located in the ATS unit if:

(a) no maintenance facility is located at the same site; or

(b) the maintenance facility is not staffed during the operational hours of the ATS unit.

9.2 Where it is not practical for maintenance to assume full responsibility for recorders, An ATS provider must ensure that:

(a) all circuits and frequencies on each recorder channel are monitored at least once daily to ensure proper recording level, good voice quality and that the time correlation is functioning correctly;

(b) recordings are suitably filed with the date and time of use indicated.; and

(c) ATC voice and surveillance recordings must be retained in accordance with the requirements of this CATS.

9.3 An ATS provider must ensure that each ATS unit is equipped with devices that record background communication and the aural environment at air traffic controller work stations,

and be capable of retaining the information recorded during at least the last twenty-four hours of operation.

9.4 Procedures relating to the recording of voice and surveillance circuits must be published in an ATS provider's ATC procedures manual as follows:

(a) Generic procedures in the ATC procedures manual - Part 1; and

(b) Unit specific procedures, where applicable, in ATC procedures manual – Part 2.

9.5 ATS Unit Managers must forward a report to the Executive Director if a failure occurs in recorder equipment during a period when an incident is known to have occurred.

10. Clocks and Time Used in ATS

10.1 An ATS provider must ensure that ATS units are equipped with clocks indicating the time in hours, minutes and seconds, clearly visible from each operating position in the unit concerned.

10.2 Each ATS unit must use Coordinated Universal Time (UTC) expressed in hours and minutes and when required, seconds of the 24-hour day, beginning at midnight (0000).

10.3 Clocks and other time display and recording devices in each ATS unit must be checked as necessary to ensure correct time to within plus or minus 30 seconds of UTC.

10.4 Wherever data link communications are utilized by an ATS unit, clocks and other time-recording devices must be checked as necessary to ensure correct time to within 1 second of UTC.

10.5 The correct time must be obtained from a standard time station or, if not possible, from another unit which has obtained the correct time from such station.

10.6 An ATS provider must publish procedures for time checks and time adjustments in Part 1 of their ATC Procedures Manual.

11. Altimeter Setting Indicator

11.1 Atmospheric pressure must be measured in Hectopascals and be transmitted to the aircraft when appropriate as published in an ATS provider's ATC procedures manual (Part 1).

11.2 The reading from the altimeter setting indicator must be compared to the weather report from the meteorological office and any discrepancy must be resolved in coordination with the MET provider.

11.3 Two independent sources of the current altimeter setting must be provided, at least one of which must be an aneroid barometer or barometric altimeter situated in the control tower.

12. ATS Surveillance System Capabilities

Compliance Note: *This section applies to the provision of surveillance system based services.*

12.1 ATS surveillance systems, such as primary surveillance radar (PSR), secondary surveillance radar (SSR), wide Area multi-lateration (WAM) and automatic dependent surveillance — broadcast (ADS-B) may be used either alone, or in combination, in the provision of air traffic services, including in the provision of separation between aircraft, provided:

(a) Reliable coverage exists in the area;

(b) The probability of detection, the accuracy and the integrity of the ATS surveillance system(s) are satisfactory; and

(c) In the case of ADS-B, the availability of data from participating aircraft is adequate.

12.2 ADS-B may be used alone, including in the provision of separation between aircraft, provided:

(a) Identification of ADS-B-equipped aircraft is established and maintained;

(b) The data integrity measure in the ADS-B message is adequate to support the separation minimum;

(c) There is no requirement for detection of aircraft not transmitting ADS-B; and

(d) There is no requirement for determination of aircraft position independent of the position-determining elements of the aircraft navigation system.

12.3 An ATS provider must ensure that ATS surveillance systems used in the provision of air traffic services have a very high level of reliability, availability and integrity. The possibility of system failures or significant system degradations which may cause complete or partial interruptions of service must be very remote. Backup facilities must be provided.

12.4 An ATS provider must ensure that ATS surveillance systems have the capability to receive, process and display, in an integrated manner, data from all the connected sources.

12.5 An ATS provider must ensure that ATS surveillance systems provide for the display of safety-related alerts and warnings, including conflict alert, minimum safe altitude warning, conflict prediction and unintentionally duplicated SSR codes and aircraft identification.

12.6 An ATS provider must ensure that they provide, for promulgation in the AIP, adequate information on the operating methods used, as well as operating practices and/or equipment limitations having direct effects on the operation of air traffic services. The provision of ATS surveillance services must be limited to specified areas of coverage and must be subject to such other limitations as have been specified by the ATS provider.

12.7 The provision of ATS surveillance services must be limited when position data quality degrades below a level determined by the ATS provider or specified by the Executive Director.

13. Situation Displays

Compliance Note: *This section applies to the provision of surveillance system based services.*

13.1 An ATS provider must ensure that situation displays providing surveillance information to the controller include, as a minimum, position indications, map information required to provide

ATS surveillance services and, where available, information concerning the identity of the aircraft and the aircraft level.

13.2 The ATS surveillance system must provide for a continuously updated presentation of surveillance information, including position indications. Position indications may be displayed as:

(a) Individual position symbols, e.g. PSR, SSR, WAM and ADS-B symbols, or combined symbols;

(b) PSR blips; or

(c) SSR responses.

13.3 An ATS provider must ensure that where surveillance data quality degrades such that services need to be limited, symbology or other means must be used to provide the controller with an indication of the condition.

13.4 An ATS provider must ensure that reserved SSR codes, including 7500, 7600 and 7700, operation of IDENT, ADS-B emergency and/or urgency modes, safety-related alerts and warnings as well as information related to automated coordination are presented in a clear and distinct manner, providing for ease of recognition.

13.5 An ATS provider must ensure that labels include, as a minimum, information relating to the identity of the aircraft, e.g. SSR code or aircraft identification and, if available, pressure-altitude-derived level information. This information may be obtained from SSR Mode A, SSR Mode C, SSR Mode S and/or ADS-B.

13.6 Labels must be associated with their position indications in a manner precluding erroneous identification by or confusion on the part of the controller. All label information must be presented in a clear and concise manner.

14. Performance of Radar Equipment

Compliance Note: *This section applies to the provision of surveillance system based services.*

14.1 An ATS provider must ensure that:

(a) the performance of the radar equipment is checked in accordance with operating instructions provided by the aeronautical telecommunication service provider under Part 171; and

(b) the technical instruction issued in respect to each radar equipment is complied with.

14.2 Each ATS provider must ensure that procedures are published in their ATC procedures manual requiring their Air Traffic Controllers to conduct the performance checks specified in 14.1.

15. Radar and Automated Systems

Compliance Note: *This section applies to the provision of surveillance system based services.*

15.1 An ATS provider must:

(a) Ensure that information concerning equipment performance, obtained from flight checks and quality of performance checks, is made available to controllers and published in Part 2 of their ATC procedures manual and develop arrangements or procedures that use the capabilities of automated systems to process and display flight data.

(b) Develop procedures that ensure the integrity of flight data exchanged between units. These procedures must include the requirement to:

(i) Forward revised flight data;

(ii) Obtain appropriate information if the flight data received from another unit cannot be processed or is incomplete; and

(c) Define co-ordination procedures to inform control sectors of revised or incomplete flight data.

16. Hand-Offs

Compliance Note: *This section applies to the provision of surveillance system based services.*

16.1 If radar hand-offs are to be used, an ATS provider must publish applicable procedures in the ATC procedures manual and, through coordination with other units if necessary, ensure that:

(a) each of the radar displays to be used provides reliable radar coverage for a sufficient distance beyond the proposed hand-off point;

(b) both displays present radar data in the hand-off area with an accuracy that meets required tolerances; and

(c) the hand-off point and any special conditions or procedures are defined.

16.2 The ATS provider may develop arrangements which omit the requirement for verbal hand-offs between IFR units subject to detailed procedures established between the units.

17. Automated System Failures

17.1 An ATS provider must ensure that automated systems inform operational personnel immediately of any failure of an automated system component that may limit their use of the equipment.

18. Interruptions to Navigation Aids (NAVAIDS) or Associated Frequencies

18.1 An ATS provider must ensure that procedures are published, allowing unit personnel to determine the circumstances under which navigational aids or frequencies must be permitted to be shutdown. These procedures must be published in the ATC procedures manual.

APPENDIX 6 TABLES OF CRUISING LEVELS

The cruising levels to be observed when so required by this Annex are as follows:

RVSM — FEET

a) in areas where feet are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 1 000 ft is applied between FL 290 and FL 410 inclusive:*

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres
010	1 000	300	–	–	–	020	2 000	600	–	–	–
030	3 000	900	035	3 500	1 050	040	4 000	1 200	045	4 500	1 350
050	5 000	1 500	055	5 500	1 700	060	6 000	1 850	065	6 500	2 000
070	7 000	2 150	075	7 500	2 300	080	8 000	2 450	085	8 500	2 600
090	9 000	2 750	095	9 500	2 900	100	10 000	3 050	105	10 500	3 200
110	11 000	3 350	115	11 500	3 500	120	12 000	3 650	125	12 500	3 800
130	13 000	3 950	135	13 500	4 100	140	14 000	4 250	145	14 500	4 400
150	15 000	4 550	155	15 500	4 700	160	16 000	4 900	165	16 500	5 050
170	17 000	5 200	175	17 500	5 350	180	18 000	5 500	185	18 500	5 650
190	19 000	5 800	195	19 500	5 950	200	20 000	6 100	205	20 500	6 250
210	21 000	6 400	215	21 500	6 550	220	22 000	6 700	225	22 500	6 850
230	23 000	7 000	235	23 500	7 150	240	24 000	7 300	245	24 500	7 450
250	25 000	7 600	255	25 500	7 750	260	26 000	7 900	265	26 500	8 100
270	27 000	8 250	275	27 500	8 400	280	28 000	8 550	285	28 500	8 700
290	29 000	8 850				300	30 000	9 150			
310	31 000	9 450				320	32 000	9 750			
330	33 000	10 050				340	34 000	10 350			
350	35 000	10 650				360	36 000	10 950			
370	37 000	11 300				380	38 000	11 600			
390	39 000	11 900				400	40 000	12 200			
410	41 000	12 500				430	43 000	13 100			
450	45 000	13 700				470	47 000	14 350			
490	49 000	14 950				510	51 000	15 550			
etc.	etc.	etc.				etc.	etc.	etc.			

* Except when, on the basis of regional air navigation agreements, a modified table of cruising levels based on a nominal vertical separation minimum of 1 000 ft (300 m) is prescribed for use, under specified conditions, by aircraft operating above FL 410 within designated portions of the airspace.

** Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks

as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

*** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.
Compliance Note. Guidance material relating to vertical separation is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).

RVSM — METRES

b) in areas where metres are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 300 m is applied between 8 900 m and 12 500 m inclusive:*

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
0030	300	1 000	–	–	–	0060	600	2 000	–	–	–
0090	900	3 000	0105	1 050	3 500	0120	1 200	3 900	0135	1 350	4 400
0150	1 500	4 900	0165	1 650	5 400	0180	1 800	5 900	0195	1 950	6 400
0210	2 100	6 900	0225	2 250	7 400	0240	2 400	7 900	0255	2 550	8 400
0270	2 700	8 900	0285	2 850	9 400	0300	3 000	9 800	0315	3 150	10 300
0330	3 300	10 800	0345	3 450	11 300	0360	3 600	11 800	0375	3 750	12 300
0390	3 900	12 800	0405	4 050	13 300	0420	4 200	13 800	0435	4 350	14 300
0450	4 500	14 800	0465	4 650	15 300	0480	4 800	15 700	0495	4 950	16 200
0510	5 100	16 700	0525	5 250	17 200	0540	5 400	17 700	0555	5 550	18 200
0570	5 700	18 700	0585	5 850	19 200	0600	6 000	19 700	0615	6 150	20 200
0630	6 300	20 700	0645	6 450	21 200	0660	6 600	21 700	0675	6 750	22 100
0690	6 900	22 600	0705	7 050	23 100	0720	7 200	23 600	0735	7 350	24 100
0750	7 500	24 600	0765	7 650	25 100	0780	7 800	25 600	0795	7 950	26 100
0810	8 100	26 600	0825	8 250	27 100	0840	8 400	27 600	0855	8 550	28 100
0890	8 900	29 100				0920	9 200	30 100			
0950	9 500	31 100				0980	9 800	32 100			
1010	10 100	33 100				1040	10 400	34 100			
1070	10 700	35 100				1100	11 000	36 100			
1130	11 300	37 100				1160	11 600	38 100			
1190	11 900	39 100				1220	12 200	40 100			
1250	12 500	41 100				1310	13 100	43 000			
1370	13 700	44 900				1430	14 300	46 900			
1490	14 900	48 900				1550	15 500	50 900			
etc.	etc.	etc.				etc.	etc.	etc.			

* Except when, on the basis of regional air navigation agreements, a modified table of cruising levels based on a nominal vertical separation minimum of 1 000 ft (300 m) is prescribed for use, under specified conditions, by aircraft operating above FL 410 within designated portions of the airspace.

** Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

*** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

Compliance Note. Guidance material relating to vertical separation is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).

Non-RVSM — FEET

c) in other areas where feet are the primary unit of measurement for altitude:

TRACK*											
From 000 degrees to 179 degrees**						From 180 degrees to 359 degrees**					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres
010	1 000	300	–	–	–	020	2 000	600	–	–	–
030	3 000	900	035	3 500	1 050	040	4 000	1 200	045	4 500	1 350
050	5 000	1 500	055	5 500	1 700	060	6 000	1 850	065	6 500	2 000
070	7 000	2 150	075	7 500	2 300	080	8 000	2 450	085	8 500	2 600
090	9 000	2 750	095	9 500	2 900	100	10 000	3 050	105	10 500	3 200
110	11 000	3 350	115	11 500	3500	120	12 000	3 650	125	12 500	3 800
130	13 000	3 950	135	13 500	4 100	140	14 000	4 250	145	14 500	4 400
150	15 000	4 550	155	15 500	4 700	160	16 000	4 900	165	16 500	5 050
170	17 000	5 200	175	17 500	5 350	180	18 000	5 500	185	18 500	5 650
190	19 000	5 800	195	19 500	5 950	200	20 000	6 100	205	20 500	6 250
210	21 000	6 400	215	21 500	6 550	220	22 000	6 700	225	22 500	6 850
230	23 000	7 000	235	23 500	7 150	240	24 000	7 300	245	24 500	7 450
250	25 000	7 600	255	25 500	7 750	260	26 000	7 900	265	26 500	8 100
270	27 000	8 250	275	27 500	8 400	280	28 000	8 550	285	28 500	8 700
290	29 000	8 850	300	30 000	9 150	310	31 000	9 450	320	32 000	9 750
330	33 000	10 050	340	34 000	10 350	350	35 000	10 650	360	36 000	10 950
370	37 000	11 300	380	38 000	11 600	390	39 000	11 900	400	40 000	12 200
410	41 000	12 500	420	42 000	12 800	430	43 000	13 100	440	44 000	13 400
450	45 000	13 700	460	46 000	14 000	470	47 000	14 350	480	48 000	14 650
490	49 000	14 950	500	50 000	15 250	510	51 000	15 550	520	52 000	15 850
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

Non- RVSM - METRES

d) in other areas where metres are the primary unit of measurement for altitude:

TRACK*											
From 000 degrees to 179 degrees**						From 180 degrees to 359 degrees**					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
0030	300	1 000	–	–	–	0060	600	2 000	–	–	–
0090	900	3 000	0105	1 050	3 500	0120	1 200	3 900	0135	1 350	4 400
0150	1 500	4 900	0165	1 650	5 400	0180	1 800	5 900	0195	1 950	6 400
0210	2 100	6 900	0225	2 250	7 400	0240	2 400	7 900	0255	2 550	8 400
0270	2 700	8 900	0285	2 850	9 400	0300	3 000	9 800	0315	3 150	10 300
0330	3 300	10 800	0345	3 450	11 300	0360	3 600	11 800	0375	3 750	12 300
0390	3 900	12 800	0405	4 050	13 300	0420	4 200	13 800	0435	4 350	14 300
0450	4 500	14 800	0465	4 650	15 300	0480	4 800	15 700	0495	4 950	16 200
0510	5 100	16 700	0525	5 250	17 200	0540	5 400	17 700	0555	5 550	18 200
0570	5 700	18 700	0585	5 850	19 200	0600	6 000	19 700	0615	6 150	20 200
0630	6 300	20 700	0645	6 450	21 200	0660	6 600	21 700	0675	6 750	22 100
0690	6 900	22 600	0705	7 050	23 100	0720	7 200	23 600	0735	7 350	24 100
0750	7 500	24 600	0765	7 650	25 100	0780	7 800	25 600	0795	7 950	26 100
0810	8 100	26 600	0825	8 250	27 100	0840	8 400	27 600	0855	8 550	28 100
0890	8 900	29 100	0920	9 200	30 100	0950	9 500	31 100	0980	9 800	32 100
1010	10 100	33 100	1040	10 400	34 100	1070	10 700	35 100	1100	11 000	36 100
1130	11 300	37 100	1160	11 600	38 100	1190	11 900	39 100	1220	12 200	40 100
1250	12 500	41 100	1280	12 800	42 100	1310	13 100	43 000	1370	13 400	44 000
1370	13 700	44 900	1400	14 000	46 100	1430	14 300	46 900	1460	14 600	47 900
1490	14 900	48 900	1520	15 200	49 900	1550	15 500	50 900	1580	15 800	51 900
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.