

**ENR 1.6 ATS SURVEILLANCE SERVICES AND PROCEDURES****1. Primary Radar**

- 1.1 Primary Radar service is not available in Colombo FIR (VCCF)

**2. Secondary Surveillance Radar (SSR)**

- 2.1 Radar units are operated as an integral part of the parent ATC unit and provide radar service to aircraft to the maximum extent practicable subject to limitations of,

- Effective radar coverage dependent on prevailing propagation conditions.
- Intensity of weather clutter areas.
- The technical capability and reliability of the backup facilities of the radar.
- Serviceability of communication systems facilities and terminations Viz-VHF tele-talk and inter ATS unit communications capability.
- Wind speeds in excess of 105 Km/h

- 2.2 The procedures for the provision of radar services are those listed in Part X of ICAO DOC 4444(PANS-RAC) and are supplemented by procedures in this section and in any air traffic control instructions issued from time to time.

**2.3 Surveillance Services**

- 2.3.1 Air Traffic Surveillance Service in Colombo FIR (VCCF) consists of

**a) Radar Service**

- Area Surveillance Radar (MSSR)
- Terminal Approach Radar(MSSR)

**b) ADS-B : Refer paragraph ENR 1.6.3****2.3.2 Surveillance Coverage**

- Area Surveillance Radar (MSSR)  
240NM FM Piduruthalagala  
(COORD:070003N0804618E)
- Terminal Approach Radar(MSSR)  
120NM FM Katunayake  
(COORD:071057N0795337E)

- 2.3.3 The ATC Surveillance Units consists of,

- Colombo Area Control Center
- Colombo Approach Control Center

- 2.3.4 The ATC Surveillance Units will use the following call signs when providing surveillance services.

- Aircraft under Colombo Area Control Center- "Colombo Control"
- Aircraft under Colombo Approach Control Center- "Colombo Director"

- 2.3.5 The ATC Surveillance Units provide Surveillance services within following range.

- Colombo Area Control Service MSSR- A lateral area described in 2.3.2 bounded by VCCF FIR boundary to the west and north-west. With vertical limits 10,000 FT up to FL460.
- Colombo Approach Control Service MSSR – A lateral area within 60NM FM KAT With vertical limits FM ground to FL150

- 2.4 Application of Air Traffic Control with regard to Surveillance Services

- 2.4.1 Aircraft Identification is achieved in accordance with the provisions specified by ICAO.

- 2.4.1.1 System of Transponder Code Assignment.

Aircraft operating in Colombo FIR will be assigned codes as follows.

- International Flights: 7301-7377
- Domestic Flights: 4000-4077

**Note:** Military aircraft may be assigned domestic codes until discreet codes are agreed upon.

- 2.4.2 The Air Situation Display information shall be used to provide the following general functions as an integral part of the Air Traffic Control Services.

- Maintain watch on the progress of flights in order to provide Colombo Area Control and Approach Control Units with,
  - Position information on aircraft under control.
  - Information on unreported traffic
  - Information on significant deviation, by aircraft from the ATC clearance issued.

- b.) Provide monitoring of aircraft and vectoring identified aircraft when necessary,
- I) To effect expeditious climb of departing traffic to cruising levels.
  - II) For resolving potential conflict with other traffic.
  - III) To assist in the navigation of aircraft when required.
  - IV) For expeditious descent from cruising levels in preparation for approach and landing.
  - V) To intercept ILS or terminal approach aids.
  - VI) To accommodate pilot preferred trajectories.
  - VII) To monitor PBN-RNAV arrival, departures, approaches and conventional (ILS, VOR & NDB) approaches in order to advise aircraft deviations from normal approach paths.
- c.) To provide vectoring for visual approaches.
- d.) Provide separation and maintain normal traffic flow when an aircraft experiences communication failure within the area of surveillance coverage.
- 2.4.3 The Minimum Horizontal Separation.
- a.) Colombo Area Control Center.
    - I) Area Surveillance Radar or ADS-B Surveillance separation will be 5NM in Colombo FIR in following airspace.
      - From Piduruthalagala to 230NM radius : 10000FT to FL460
      - BTN 230NM - 330NM radius from Piduruthalagala : FL290 to FL 460
  - b.) Colombo Approach Control Center.
    - I) Terminal Approach Radar only  
Within 60NM from Katunayake: 5NM  
Subject to Minimum Vectoring Altitude.
- 2.4.3.1 Above minimum horizontal separation values may be increased at the discretion of the individual controller when the following circumstances so necessitates;
- a.) High rates of closure between aircraft of track convergence.
  - b.) Slow rates of renewal of surveillance information.
  - c.) When the controller expects communication difficulties due to congestion of communication channels.
- 2.4.3.2 Levels assigned by the controller to pilots will provide a minimum terrain clearance during entire phase of flight.
- 2.4.4 Surveillance & Communication Failure Procedure
- 2.4.4.1 Area Control Center
- a.) Radar Failure  
As a redundancy, Approach Radar, ADS-B or ADS-C is available.
  - b.) Communication Failure Refer 2.5.8
- 2.4.4.2 Approach Control Center
- a.) Radar Failure In the event of radar failure or loss of radar identification, instructions will be issued to restore procedural separation and change over to appropriate frequency if considered necessary
  - b.) Communication Failure In case of controlled aircraft experiencing communication failure and is an area where radar separation is applied, such radar separation shall continue to be applied.  
If the aircraft is one which has not been identified, the radar controller shall maintain separation between aircraft under radar control and any identified aircraft observed along the expected route of the aircraft with communication failure, until it is known that the aircraft has passed through the airspace concerned or has landed elsewhere. Also refer 2.5.8
- 2.5 Operating Procedures of Aircraft with Regard to Surveillance Service.
- 2.5.1 System of Transponder Code Assignment. (See ENR 1.6-2.4.1)
- 2.5.2 All aircraft flying within designated Controlled Airspace shall operate transponders selecting Mode A (4096 codes) and Mode C simultaneously.
- 2.5.3 All aircraft operating in Colombo FIR shall operate transponders in accordance with instructions given by ATC.
- 2.5.4 Pilots who have been received specific instructions from ATC concerning the setting of the transponder shall maintain that setting except in circumstances detailed in following paragraphs 2.5.6, 2.5.7 & 2.5.8.
- 2.5.5 When entering the airspace of a different ATC Unit, aircraft shall operate the transponder code last assigned by the previous ATC or if no code has been assigned, the ATC should be contacted for the required code or shall squawk A2000.
- 2.5.6 Emergency Procedure
- 2.5.6.1 The pilot of an aircraft encountering a state of emergency shall set the transponder code to A7700.

- 2.5.7 Unlawful Interference
- 2.5.7.1 Pilot of an aircraft in flight subjected to unlawful interference shall endeavor to set the transponder to Mode A code 7500 to make the situation known, unless circumstances warrant the use of Mode A code 7700.
- 2.5.8 Radio Communication Failure
- 2.5.8.1 In case of an aircraft experiencing two-way radio communication failure, the pilot of the aircraft shall set his transponder to code A7600 and follow the established procedure and subsequent control of the aircraft will be based on these procedures.
- 2.6 Graphical Portrayal of Radar Coverage
- 2.6.1 Chart depicting the surveillance coverage (Radar) is not published.
- 3. Automatic Dependent Surveillance-Broadcast (ADS-B)**
- 3.1 Aircraft equipage mandate for ADS-B (OUT)
- 3.1.1 Aircraft operates within Colombo ADS-B (Out) airspace ;
- The aircraft must carry serviceable 1090MHz extended squitter (1090ES) ADS-B transmitting equipment that has been certificated as meeting:-
- European Aviation Safety Agency - Certification Considerations for the Enhanced ATS in Non-Radar areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHz Extended Squitter (AMC 20-24), or
  - European Aviation Safety Agency - Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance Subpart D — Surveillance (SUR) (CS-ACNS.D.ADS-B) , or
  - Federal Aviation Administration – Advisory Circular No: 20-165A (or later versions) Airworthiness Approval of Automatic Dependent Surveillance – Broadcast (ADS-B) Out Systems, or
  - The equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.
- 3.1.2 Any registered aircraft with a maximum certified take-off mass exceeding 5700 kg or having a maximum cruising true airspeed capability greater than 250 knots, with a date of manufacture on or after 1 January 2020 which intends to operate within Colombo ADS-B airspace be equipped with ADS-B avionics compliant with Version 2 ES (equivalent to RTCA D0-260B) or later version.
- 3.1.3 Carriage of ADS-B equipment will remain as an option for aircraft flying below FL290 until further notice.
- 3.1.4 No Operational approval is required by the aircraft operators, to conduct ADS-B (Out) operations within Colombo ADS-B (Out) airspace.
- 3.1.5 Aircraft not complying with the equipment requirements specified in paragraph 3.1.1 and 3.1.2 will not be permitted to operate in the Colombo ADS-B (Out) airspace.
- 3.2 Surveillance and separation
- 3.2.1 ADS-B data may be used alone within the exclusive ADS – B airspace and in the rest of the surveillance airspace, in combination with data obtained by Radar.
- 3.2.2 All safety net features (MSAW, STCA, MTCD, RAM, DAIW etc.) shall possess the same responsiveness as equivalent radar safety net features.
- 3.2.3 ADS-B separation standard shall be 5NM within the Colombo ADS-B airspace.
- 3.3 Contingencies
- 3.3.1 ATC shall terminate the Surveillance separation and immediately provide the Procedural separation for aircraft, if the radar and or ADS-B contact is lost from an ATC air situation display.
- 3.3.2 The pilot-in-command, upon awareness of an onboard ADS-B equipment failure, shall inform ATC as soon as possible. ATC would then provide the necessary clearance to ensure separation with other flights operating in the delineated airspace.

3.4 Phraseology

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| To request the capability of the ADS-B equipment                                 | a) ADVISE ADS-B CAPABILITY;<br>*b) ADS-B TRANSMITTER (data link);<br>*c) ADS-B RECEIVER (data link);<br>*d) NEGATIVE ADS-B.<br><br>* Denotes pilot transmission.<br>Note: For (b) and (c) – the options are not available for aircraft that are not equipped. |
| To request reselection of aircraft identification re-enter Flight Identification | RE-ENTER FLIGHT IDENTIFICATION  |
| Termination of RADAR and/or ADS-B service  | IDENTIFICATION LOST [reasons] (instructions).   |
| To request the operation of the MODE S or ADS-B IDENT feature                    | SQUAWK IDENT.   |

3.5 Flight Planning Requirements

3.5.1 Flight Identity

3.5.1.1 The Aircraft Identification (ACID) must be accurately recorded in “item 7” of the ICAO Flight Plan form. The Aircraft Identification, not exceeding 7 characters, is to be entered both in “item 7” of the flight plan and replicated exactly when set in the aircraft FMS (for transmission as Flight ID) in ADS-B transmissions as follows:

- (a) The ICAO three-letter designator for the aircraft operating agency followed by the flight identification; or
- (b) The aircraft registration, when the radiotelephony call sign consists of the aircraft registration.

Note: Aircraft Identification (ACID) entered should not have any leading zeros unless it is part of the flight number as indicated in “item 7” of the ICAO flight plan. Hyphens, dashes or spaces are NOT to be used.

3.5.2 Surveillance Equipment and Capabilities –“Item 10b”

3.5.2.1 Aircraft operators complying with the requirements stipulated in paragraph 3 shall indicate the appropriate ADS-B designator in “item 10b” of the flight plan.

- B1**-ADS-B with dedicated 1090 MHz ADS-B "out" capability
- B2**- ADS-B with dedicated 1090 MHz ADS-B "out" and "in" capability

**3.5.3 Transponder Capability –“Item 10b”**

**3.5.3.1** Aircraft operators complying with the requirements stipulated in paragraph 3 shall indicate the appropriate Mode S designator in “item 10b” of the ICAO flight plan.

- (a) E Transponder — Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability, or
- (b) L Transponder — Mode S, including aircraft identification, pressure-altitude, extended squitter (ADS-B) and enhanced surveillance capability.

**3.5.4 Other Information –“Item 18”**

**3.5.4.1** ICAO Aircraft Address (24 Bit Code) shall be recorded in “Item 18” of the ICAO flight plan, in hexadecimal format as per the following example:

CODE/7C432B

**3.6 Exclusive ADS-B (OUT) Airspace**

**3.6.1** Lateral:  
330NM from Piduruthalagala (COORD: 07 00 03 N 080 46 18E), within VCCF limiting from a line joining from 03 00 00 N 078 00 00 E (LAVOX) to 03 00 00 N 084 35 09 E

Vertical:  
Between FL290 & FL460 (inclusive)

(Refer ENR 1.6-9 for graphical view).

# Colombo ADS-B (Out) Airspace

CIVIL AVIATION AUTHORITY OF SRI LANKA

AIRAC AIP AMDT 1/21

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ENR 1.6-9  
15 JUL 21

