

United Kingdom Overseas Territories Aviation Circular

**OTAC 171-09
172-16**

Use of Non-Radar ATS Surveillance Systems

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GENERAL

Overseas Territories Aviation Circulars (OTACs) are issued to provide advice, guidance and information on standards, practices and procedures necessary to support Overseas Territory Aviation Requirements (OTARs). They are not in themselves law but may amplify a provision of the Air Navigation (Overseas Territories) Order (AN(OT)O or provide practical guidance on meeting a requirement contained in the OTAR.

PURPOSE

The purpose of this OTAC is to provide information on the requirement to include in appropriate Air Traffic Services (ATS) Operations Manuals (MATS/ATS Exposition) guidance material on the use of ATS surveillance systems in the provision of an Air Traffic Control (ATC) or Aerodrome Flight Information Service (AFIS). **For clarity, the use of 'ATS' throughout this document refers to both ATC and AFIS as appropriate.**

RELATED REQUIREMENTS

This Circular relates to OTAR Parts 171 and 172.

CHANGE INFORMATION

First issue.

ENQUIRIES

Enquiries regarding the content of this Circular should be addressed to Air Safety Support International at the address on the ASSI website www.airsafety.aero or to the appropriate Overseas Territory Aviation Authority.

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UNCONTROLLED WHEN PRINTED**1 Introduction**

- 1.1 Recent developments in ATS surveillance technologies, particularly Automatic Dependent Surveillance – Broadcast (ADS-B), mean that it is becoming increasingly economically viable to support the provision of ATS in certain classes of airspace with information from an ATS surveillance system.
- 1.2 ASSI has been working with our industry and regulatory partners across the world to develop procedures and specifications relating to an ATS surveillance system whose purpose is solely to support the provision of ATS. As such, the system does not require the level of integrity of more traditional ATS surveillance systems that are used by air traffic controllers to establish and maintain separation minima between aircraft.
- 1.3 In an aerodrome (non-radar) context, the ATS surveillance system may take electronic conspicuity data from a number of sources (e.g. Secondary Surveillance Radar (SSR) and ADS-B) and present that information to unit personnel¹ through a Flight Information Display (FID). This is known as cooperative surveillance but it requires all elements in the surveillance chain to be interoperable. Where cooperative surveillance alone is used, aircraft without operating and/or interoperable SSR transponders or ADS-B transmitters will not be detected. As a result, unit personnel will not be aware of their presence and thus not be able to warn other pilots of their proximity.
- 1.4 The purpose of the FID is to improve the situational awareness of unit staff and to assist them in providing information that is useful for the safe and efficient conduct of flights. The information presented on the FID shall not be used as a substitute for pilot position reports, or to replace the read-back of those ATS messages specified in ICAO Doc 4444. The information presented on the FID may be used as an aid to confirm pilot position reports.
- 1.5 The use of an ATS surveillance system in the provision of an ATS does not relieve the pilot-in-command of an aircraft of any responsibilities.

2 Background

- 2.1 Whilst area control centres have utilised ATS surveillance systems for some years to assist in the reduction and prevention of airspace infringements, they have not used them to directly support the provision of ATS in the aerodrome environment within the UK Overseas Territories (OTs). Moreover, the costs associated with such systems have, typically, been prohibitive for smaller aerodromes.
- 2.2 The use of ADS-B technology in supporting the provision of ATS has been trialled, with the results of that trial demonstrating that we are in a position to develop policy and procedures relating to the more widespread use of this technology in an aerodrome context.
- 2.3 ASSI has also been working with our industry and regulatory partners across the world to develop equipment specifications for ATS surveillance systems whose purpose is solely to aid in the provision of ATS in a non-radar environment. As such, the system does not require the same level of integrity of more traditional ATS surveillance systems that are used by Air Traffic Control Officers (ATCOs) to establish and maintain separation minima between aircraft.

¹ In the context of this document 'unit personnel' means an Air Traffic Control Officer (ATCO) or Flight Information Service Officer (FISO) (as appropriate).

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- 2.4 Finally, these developments need to be seen in the wider context of ASSI's ongoing work to expedite the widespread adoption of electronic conspicuity utilising ADS-B across the aviation sector. From an ATS perspective, we can use the information from ATS surveillance systems to support service provision and, specifically, to reduce the risks of mid-air collision, airspace infringement and controlled flight into terrain through improved knowledge of an aircraft's position and level.

3 General

- 3.1 This OTAC, at Appendix A, introduces new policies and procedures relating to the use of developing ATS surveillance systems which, once mature, will become a new OTAR Part 172 Appendix and in turn, where appropriate, be transposed into the Air Navigation Service Provider's (ANSP's) operations manual. It describes the functions for which an ATS surveillance system may be utilised – basic functions and enhanced functions – and describes how these functions are to be provided.
- 3.2 At present, the technical specifications for ADS-B based ATS surveillance systems support the provision of the basic functions alone. The use of ATS surveillance systems to provide enhanced functions is dependent upon wider developments including, inter alia, more widespread use of ADS-B technology, adoption of ASSI proposals on training, qualification and licensing etc.

UNCONTROLLED WHEN PRINTED**APPENDIX A – Operations with a Flight Information Display (FID)**

The introduction of the use of an ATS surveillance system represents a change to the functional system that is to be notified in accordance with OTAR Part 171. The ATS provider shall undertake a safety assessment in accordance with OTAR Part 171 and OTAR Part 172 and obtain regulatory approval prior to using a FID in the ATS environment.

1.1 Functions of ATS surveillance systems in ATS

ATS surveillance systems may be utilised to perform different functions – basic functions and enhanced functions – in supporting the provision of ATS and, by inference, a basic service. The performance of basic functions or enhanced functions is dependent upon, inter alia, the performance specification of the ATS surveillance system in-use and the licence privileges granted to the ATCO/FISO.

1.2 Basic functions of ATS surveillance systems in ATS

In the absence of a 'conventional' ATS surveillance system (See ICAO PANS-ATM 8.10.1) and when approved by the regulator, the FID may be used to support the provision of ATS in performing the following functions:

- a) flight path monitoring of aircraft on final approach;
- b) flight path monitoring of other aircraft in the vicinity of the aerodrome;
- c) providing navigation assistance to Visual Flight Rules (VFR) flights; and,
- d) enhancing the provision of traffic information.

1.3 Enhanced functions of ATS surveillance systems in ATS

1.3.1 ICAO Doc 4444 PANS-ATM² (8.7, 8.8, 8.9 & 8.11) describes the functions of ATS surveillance systems in the provision of flight information services and, in relation to ATS, ASSI considers these to be 'enhanced functions'.

1.3.2 At present, the technical specification developed by ASSI for the FID supports only the use of ATS surveillance systems to provide basic functions. For reference, ATS operational procedures that will be utilised in relation to the enhanced functions of an ATS surveillance system in the provision of ATS will be sourced from ICAO Doc 4444 PANS-ATM Section 8.

1.3.3 Units wishing to enquire about or gain further guidance on the enhanced functions should contact their ASSI/OTAA ATS Inspector.

1.4 Suggested Phraseology – Basic Functions

1.4.1 In relation to the basic functions described in Appendix A, paragraph 1.2:

a) Flight path monitoring of aircraft on final approach

1) 'Flight path monitoring' means that information from an ATS surveillance system may be used to:

- confirm that an aircraft that reported as being on final is approaching the correct runway;

² ICAO Doc 4444 PANS-ATM Section 8.11

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- monitor the progress of a flight conducting a notified instrument approach procedure (IAP) at the aerodrome;

2) For example:

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CONFIRM FINAL RUNWAY 27

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CAUTION, CHECK LEVEL

b) Flight path monitoring of other aircraft in the vicinity of the aerodrome

1) 'Flight path monitoring of other aircraft in the vicinity of the aerodrome' means that information from an ATS surveillance system may be used to:

- monitor the progress of a flight conducting a notified Instrument Approach Procedure (IAP) at the aerodrome;
- assist in confirming the reported position of aircraft joining and established within the aerodrome traffic circuit;
- determine whether aircraft operating in the vicinity of the aerodrome and not in receipt of an ATS from that unit pose a collision hazard to aerodrome traffic;
- determine whether aerodrome traffic, or aircraft in receipt of an ATS from the unit, are proximate to adjacent airspace structures and at risk of infringing airspace;
- assist in visually acquiring aircraft operating within the aerodrome traffic circuit; and,
- assist in confirming the position of aircraft in a state of DISTRESS or URGENCY.

2) For example:

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CAUTION, BELIEVE YOU'RE APPROACHING THE BAYSIDE CTR, CONFIRM INTENTIONS

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CONFIRM YOUR [POSITION] / [LEVEL] / [ROUTING]

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CONFIRM DOWNWIND RUNWAY 27

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CONFIRM EMERGENCY

c) Providing navigation assistance to VFR flights

1) 'Providing navigation assistance to VFR flights' means that information from an ATS surveillance system may be used to advise the pilot:

- of their position in relation to a known geographic feature (for example, a town or the aerodrome);
- if they are proximate to adjacent airspace structures and at risk of infringing airspace;
- if they appear to be approaching an area with a markedly different Minimum Sector Altitude (MSA) and are reported or are observed to be operating below that MSA.

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2) For example:

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, YOUR POSITION INDICATES 3 MILES NORTH OF WEST BAY.

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CONFIRM YOUR [POSITION] / [LEVEL] / [ROUTING]

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CAUTION, BELIEVE YOU'RE APPROACHING THE BAYSIDE CTR, CONFIRM INTENTIONS

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, CAUTION, BELIEVE YOU'RE APPROACHING AN AREA OF RISING TERRAIN.

d) **Enhancing the provision of traffic information**

1) 'Enhancing the provision of traffic information' means that information from an ATS surveillance system may be used to supplement that received from pilot reports and the unit staffs' visual observations. For example:

- broadcast a warning, in general terms, to aerodrome traffic about unknown aircraft that are observed to be approaching the aerodrome traffic circuit including the area in which AIPs are being conducted;
- provide a warning, in general terms, to departing or arriving flights about aerial activity that is observed to be operating in the vicinity of the intended route of the departing or arriving flight; and,
- provide a warning to a pilot when unit staff consider that a definite risk of collision exists.

(2) For example:

ALL STATIONS, 'UNIT CALLSIGN', TRAFFIC BELIEVED TO BE 2 MILES EAST OF WEST BAY, TRACKING WEST, INDICATING 2 THOUSAND FEET

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, TRAFFIC BELIEVED TO BE OPERATING 10 MILES NORTH OF WEST BAY INDICATING 2 THOUSAND FEET

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, MULTIPLE AIRCRAFT BELIEVED TO BE OPERATING OVER SMALLVILLE, NO HEIGHT INFORMATION

NOVEMBER-ONE-TWO-THREE-ALPHA-BRAVO, TRAFFIC BELIEVED TO BE YOU HAS TRAFFIC CONVERGING FROM NORTH INDICATING 3 THOUSAND FEET

Note. The final example relates solely to the provision of a warning when unit staff consider that a definite risk of collision exists.

(3) Whilst these examples include the provision of height information, in developing unit local instructions, ATS units must exercise caution in considering the use of displayed aircraft level information. Geometric height information shall not be used and consideration must be given to how the ATS surveillance system processes and displays level information that is based on barometric pressure. See also 1.4.3 b) and c) below.

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1.4.2 In performing the basic functions described in paragraph 1.2, unit staff shall not use the information displayed on the FID to:

- a) establish the identification of an aircraft; and
- b) validate the SSR Mode 3A code or Mode S and ADS-B aircraft identification or verify pressure-altitude-derived level information.

Pilots requiring such a service should be advised to contact an appropriate ATS unit that provides ATS surveillance services.

1.4.3 In performing the basic functions described in paragraph 1.2, when unit staff observe that:

- a) the aircraft identification transmitted by a SSR Mode S or ADS-B equipped aircraft appears to differ from that expected from the aircraft, they should ask the pilot to confirm the aircraft identification. If, following confirmation by the pilot that the correct aircraft identification has been set on the SSR Mode S or ADS-B identification feature, the discrepancy continues to exist, the ATCO /FISO shall inform the pilot but take no further action.
- b) the pressure-altitude-derived level information transmitted by a SSR Mode C, SSR Mode S or ADS-B equipped aircraft in flight and displayed to the unit staff is either not present, or is displayed as zero(es), they should ask the pilot to confirm that they have selected the altitude reporting feature. If, following confirmation by the pilot that they have selected the pressure-altitude reporting feature, the discrepancy continues to exist, the ATCO/FISO shall inform the pilot but take no further action.
- c) the pressure-altitude-derived level information transmitted by a SSR Mode C, SSR Mode S or ADS-B equipped aircraft in flight and displayed to unit staff is \pm 300 ft or more from the level reported by the pilot, the ATCO/FISO should advise the pilot of the appropriate altimeter pressure setting.

1.5 Regulatory Requirements for use of a FID

ATS units seeking ASSI approval to utilise an ATS surveillance system to support the provision of ATS must:

- a) Comply with OTAR Part 171 and OTAR Part 172.
- b) Specify within unit local instructions, inter alia:
 - 1) the functions for which information from the ATS surveillance system will be used;
 - 2) the defined lateral and vertical area of coverage within which information from the ATS surveillance system will be utilised;

Note. The defined lateral and vertical area of coverage shall not exceed the Designated Operational Coverage (DOC).

- 3) procedures for the functions for which information from the ATS surveillance system will be used, including:
 - failure of ATS surveillance system or systems; and
 - failure of airborne electronic conspicuity, including SSR transponder failure.

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- 4) procedures for operating and configuring the FID including:
 - daily check of equipment serviceability;
 - the standardisation of map and overlay settings;
 - the standardisation of equipment settings.
- 5) system limitations including, inter alia:
 - the presentation of position plots on the FID with no integrity;
 - the sources of electronic conspicuity data utilised to provide the position indications displayed on the FID; i.e. ADS-B, SSR etc;
 - detectability; for example, out of line-of-sight, lack of multi-lateration (MLAT) system triangulation;
 - potential effects on mobile broadband communication links from outstations, which may be subject to external interference;
- 6) procedures for reporting:
 - any fault in the equipment;
 - any incident requiring investigation;
 - any occurrence where corrupt ADS-B data is displayed;
 - any circumstances which make it difficult or impractical to utilise the FID in the provision of Flight Information Services (FIS).
- c) Ensure that the FID and supporting ATS surveillance system meet the performance specification standards required for the use of either the basic or enhanced functions, as appropriate, as defined within OTAR Part 171 - Aeronautical Telecommunications Services and ICAO Annex 10.
- d) Ensure that, in developing procedures for the use of the FID, the availability and use of the FID will not be detrimental to unit staff's visual observation of aerodrome traffic.
- e) Ensure that the FID is positioned in such a way as to not be distracting or prominent to unit staff but available for 'at a glance' reference, ensuring that it does not detract from their ability to access the other equipment at the working position.