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Common Aeradio Communications

Interface Control Document

for the North Atlantic Region

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RECORD OF AMENDMENTS

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EXECUTIVE SUMMARY

1. The North Atlantic air navigation plan, which was developed in the context of the regional implementation of the ICAO communications navigation surveillance/air traffic management systems, has, at its core, the need for a communications and data interchange infra-structure that will largely obviate the need for verbal coordination between those facilities providing communications and air traffic services to aircraft operating in the North Atlantic Region.

2. Data interchange, as defined in this document, provides the means by which North Atlantic air traffic services units will be able to communicate with aeradio stations other than the station with which it would normally be associated. This should provide harmonization of the systems used in the North Atlantic Region. While looking to the future, the message sets and procedures contained herein have been designed to meet today's needs as well as to enable the transition to an automatic dependent surveillance based air traffic control system.

3. This document also defines the basic communications and support mechanisms needed to underpin the coordinated implementation, throughout the North Atlantic Region, of the data interchange requirements.

4. Finally, in order to ensure stability in the design and implementation of the messages listed herein, a configuration management process has been agreed to which is applicable to all North Atlantic provider States.

FOREWORD

1. HISTORICAL

1.1 At its twenty-fifth meeting (Paris, September 1988), the North Atlantic Systems Planning Group (NAT SPG) established a Task Force to develop a future ATS system concept for the whole of the NAT Region (NAT SPG/25, Conclusion 25/11 refers).

1.2 In order to carry out the work, the Task Force established several working groups to examine various matters including OAC's requirements for OLDI. Consequently, a need was identified for a common Interface Control Document (ICD) that would lay down the modalities to support OLDI exchanges between ATS units within and adjacent to the NAT Region. These exchanges are a pre-requisite for the integration of the various Flight Data Processing System/Flight Plan Processing Systems (FDPS/FPPS).

1.3 The NAT SPG reviewed the recommendation of the Task Force at its twenty-sixth meeting (Paris, May 1990) and agreed that an OLDI working group should be established to oversee the evolutionary development and coordinated implementation of a common ICD for the NAT Region (NAT SPG/26, Conclusion 26/17 refers). The NAT SPG also agreed that all matters related to OLDI should be added to the NAT SPG Work Programme and reviewed at each meeting. On this basis, the NAT OLDI Group met twice (Ottawa, 26-30 November 1990 and Paris 15-19 April 1991) in order to develop sufficient material to allow States to start planning for the implementation of OLDI.

1.4 At its twenty-seventh meeting (Paris, June 1991), the NAT SPG noted that the ICD was sufficiently mature to be used for planning purposes and therefore agreed that States should endeavour to replace agreements that existed at the time with the common ICD by the end of 1991. At the same time, the NAT SPG agreed to include a master list of fixes (MLF) in the ICD and to change the original terms of reference of the NAT OLDI group to include database compatibility, the development of standardized air/ground messages transmitted between aeradio stations and OACs, air/ground messages data link messages needed to support trials and to address other OLDI matters as appropriate (NAT SPG/27, Conclusion 27/28 refers). In the same context, the NAT OLDI group was named as the Group of Primary Interest for several lines of action included in the NAT Implementation Document (NAT ID) as shown in Attachment E of Part VI of the report of NAT SPG/27.

1.5 The ICD contained herewith has been developed, initially, by the NAT OLDI group and thereafter by the NAT Communications and ATM automation Group (COMAG) in accordance with the above.

1.6 After the formation of the NAT Implementation Management Group (IMG) the work of maintaining the ICD was delegated to the Communications and Datalink Applications Group (CADAG) with input also received from the NAT/SPG Aeronautical Communications Sub-Group (ACSG).

1.7 In 2004 a Task Force established by the Implementation Management Group of the NAT/SPG reviewed the document and updated it to version 1.3.

ABOUT THE DOCUMENT

The Common aeradio communications ICD for the NAT Region is divided into the following 2 Parts:

PART I - PURPOSE, POLICY AND UNITS OF MEASUREMENT

This part provides an overall philosophical view of the ICD, general information concerning the units of measurement that are used and information on data that is applicable to all service providers.

PART II - NAT ATS AERADIO COMMUNICATIONS MESSAGES

This part describes, in detail, all the messages used to exchange data between NAT OAC/ACC FDPSs and concerned aeradio stations.

PART I - PURPOSE, POLICY AND UNITS OF MEASUREMENT

1. PURPOSE

1.1 The purpose of this document is to ensure that data interchange between NAT Air Traffic Service (ATS) units and aeradio stations is harmonised to a common standard. This document does not take into account the implementation of air/ground data links.

1.2 It is not intended that procedures already in existence and in use between aeradio stations and their associated oceanic area control centre/area control centre (OAC/ACC) be necessarily affected by the requirements of this ICD. In the interest of global standardisation, ICAO agreed methods are used to the extent possible.

2. POLICY

2.1 Changes

2.1.1 This ICD is under configuration control and is administered by the ICAO European and North Atlantic Office. Changes to the document shall only be made as a result of agreement by the NAT SPG Communications and ATC Automation Group. Significant amendments affecting the purpose and policy will need the approval of the NAT SPG itself.

3. UNITS OF MEASUREMENT

3.1 Time

3.1.1 All times shall be expressed in UTC. The format will be hours, minutes, seconds (hhmmss), with seconds optional and subject to bilateral agreement.

3.2 Geographic position information

3.2.1 Geographic position information shall be in accordance with the provisions contained in the Procedures for Air Navigation Services - Rules of the Air and Air Traffic Services (PANS-RAC, Doc 4444). However, in order to accommodate current and future airborne systems, provision shall be made for handling latitudes and longitudes with a resolution of tenths of a minute, a decimal point being used to separate the fraction from the integer part (example: "6543.1N03001.6W").

3.3 Level and speed information

3.3.1 All level information shall be specified as flight level(s) or altitude(s) expressed in hundreds of feet. Speed information shall be expressed as true airspeed in knots or as a Mach number.

Table 1- Flight Level Representation

	Flight Level Representation	Description
1	F330	Current flight level (or to report reaching)
2	F250B270	FL blocking FL
3	F510C550	FL cruise climb for FL
4	F330L(350)	Leaving flight level (optional, “for FL350”)
5	F330X(350)	Crossing flight level (optional, “for FL350”)

Note: *4 and 5 are* ***not*** *applicable for RCL and REQ messages.*

4. ENGINEERING CONSIDERATIONS

4.1 Data Transfer Serial Numbers (Dtsn)

4.1.1 The use of DTSN's for message exchange between OAC/ACC's and aeradio stations shall be subject to bilateral agreements. Where such agreements exist, the use of the DTSN's will be used in accordance with the following paragraphs.

4.1.2 When the DTSN procedures are used, messages will contain a 3 digit DTSN in field 3. This number will run from 001 to 000 (representing 1000) inclusive, and will reset to 001 on passing 000.

4.1.3 All NAT data processing systems must be capable of checking the continuity of numbers on a per interface basis and of initiating notification of discrepancies. All messages received with a DTSN in ATS field 3 shall be acknowledged.

4.1.4 All messages having a DTSN will also contain direction indicators immediately preceding the DTSN, as defined for ATS field 3 in ICAO Doc. 4444.

4.1.5 The following unit location indicators taken from ICAO Doc 7910 shall be used:

Bodø OAC	-	ENOB
Gander OAC	-	CZQX
New York OAC	-	KZWY
Reykjavik OAC	-	BIRD
Santa Maria OAC	-	LPPO
Shanwick OAC	-	EGGX
Søndre Strømfjord FIC	-	BGGL
Iceland radio	-	BICC
Shanwick aeradio	-	EIAA
Gander IFSS	-	CYQX
Santa Maria aeradio	-	LPAZ
Bodø aeradio	-	ENBO
New York aeradio	-	KNWC

4.2 Forwarding of Position Reports

4.2.1 Forwarding of position report messages entails that a centre receiving a position report forwards the position report to any other centre that may be affected by the aircraft. This function enables the detection of the following operational errors:

a) The receiving centre may detect that the transferring centre has failed to coordinate the aircraft; and

b) The receiving centre may detect that there is a discrepancy between the coordinated profile and the actual aircraft profile.

Forwarding position reports therefore has the potential to bring a significant safety improvement to the system.

4.2.2 A Position report message normally contains the following information:

Position 1 (reported position)
Actual time at Position 1

Level
Position 2
Estimated time at Position 2
Position 3

4.2.3 If either Position 1 or Position 2 in the position report are located within the Area of Common Interest (ACI) of another centre then the original recipient of the report shall forward the report to that centre.

4.2.4 If agreed between the units concerned, the position report shall also be forwarded if Position 3 in the position report is located within the ACI of another centre.

PART II - NAT ATS AERADIO COMMUNICATIONS MESSAGES

1. INTRODUCTION

1.1 The following sections describe those messages used to transfer information between NAT ATC systems and Aeradio stations serving the NAT region. Message fields will conform to the extent possible to ICAO field definitions (PANS-RAC 4444, Twelfth Edition), and are referred to by field number.

1.2 Abbreviations and codes used in messages should conform to the extent possible to ICAO Document 8400 (Abbreviations and Codes). If this is not possible a common agreement should be reached in order to avoid multiple codes to represent the same situation.

2. MESSAGE DEFINITIONS

2.1 The following message types shall be used for communications between NAT Aeradio stations and NAT oceanic area control centres/area control centres (OAC/ACC).

NAT AIR/GROUND RELAY MESSAGES	
MESSAGE TYPE	DESCRIPTION
EMG	Emergency
MIS	Miscellaneous
POS	Position
RBK	Read back
RCL	Oceanic Clearance Request
REQ	Re-clearance Request
RPE	Reported Estimate
SEL	Selcal code
SQK	SSR assignment
RLS	Report level or speed

2.2 The ATS field numbers stated in the message formats refer to Standard ICAO message fields as defined in Appendix 3 of ICAO Document PANS-RAC 4444. Fields which do not conform with ICAO provisions are defined in accordance with the following key:

a	=	alpha character
9	=	numeric character
(2-11)	=	variable number of characters between 2 and 11
X	=	mixed alphas and numerics
sp	=	space character
-	=	hyphen which precedes each field except the first
[ ]	=	optional information are encapsulated in square brackets
( )	=	the text portion of all ATS messages are encapsulated in parenthesis

Note:- *Underlining in the examples indicates that the field can be repeated.*

2.3 In order to facilitate the exchange of communications related information between aeradio stations, the optional subfield Communication Support Facility (CSF/) can be included in field 18. Information such as quality of transmission, frequencies in use, read back and roger stations etc can be included in the CSF/ subfield. For data link messages this field will contain information describing the communications path and other relevant data.

2.4 The RMK sub-field will be used for communicating ATC relevant information which does not adhere to any specific format.

2.5 The MET sub-field will describe, in a structured manner, the routine weather observations made at reporting points and mid-points. The data will generally follow the format currently used. In addition, this sub-field will be used to describe significant weather phenomena in a fixed format, thus facilitating automatic extraction of said data by automation systems. The format consists of fixed abbreviations for both the phenomena being reported and their severity both are listed in the tables below:

Phenomena

TURB	Turbulence causing excursions from intended flight path
CHOP	Turbulence experienced as a rapid vibration of the aircraft
ICE	Icing
TS	Thunderstorm

Severity codes

FBL	Light
FTM	Light to moderate
MOD	Moderate
MTS	Moderate to severe
SEV	Severe

Note:

In messages the phenomenon being experienced will be followed by the severity code as in "MET/MS56 230/095 TURB MOD". Three additional phenomena – CB (CumuloNimbus) TC (Towering Cumulus) and VA (Volcanic Ash) may also be reported but without an associated severity code. Multiple phenomena may also be reported simultaneously as in "MET/TURB MOD ICE SEV CB".

3. FUNCTIONAL ADDRESSES

3.1 A functional address which refers to a function within an OAC/ACC (e.g. an ATC watch or communications supervisor) may be substituted for the aircraft identification in Field 7. Where such an address is used, it is preceded by an oblique stroke(/) to differentiate it from an aircraft identification. The only functional address defined at this stage is "ASUP" ("attention supervisor").

4. MESSAGES

EMG (EMERGENCY)

Purpose

Used when it is considered that the contents require immediate attention. The following are some examples of circumstances which would justify the use of an EMG message:

a) Reports of emergency calls or emergency locator transmission reports.

b) Messages concerning hi-jack or bomb warnings.

c) Messages concerning serious illness or disturbance among passengers.

d) Sudden alteration in flight profile due to technical or navigational failure.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
18	RMK/ subfield, CSF/ subfield

Example

a) (EMG-UAL123-RMK/ENGINE TWO INOP, REQ DCT EGPK CSF/EIAA RB TC20QD CYQX R)

Emergency message from UAL123 reporting engine failure and requesting re-clearance. In the circumstances it is logical to include the request for re-clearance in this message rather than in a separate REQ message.

b) (EMG-/ASUP-RMK/ALL HF COMMUNICATIONS LOST DUE SUNSPOT ACTIVITY)

Emergency message reporting a general HF blackout. Since this message is not relevant to any specific flight the ASUP address is used.

MIS (MISCELLANEOUS)

Purpose

Used to transmit information which cannot be formatted to comply with any other message type and for plain language statements.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
18	RMK/ subfield, CSF/ subfield

Examples

a) (MIS-NWA456-RMK/HAS ANY TURBULENCE BEEN REPORTED ALONG OUR ROUTE CSF/EIAA RB TC20QD CYQX R)

Miscellaneous message from NWA456 requesting weather information.

b) (MIS-/ASUP-RMK/PLS NOTE THAT BID2 IS ACTIVE. NOTAM A2043/99 REFERS)

Miscellaneous message not relevant to any specific flight and therefore addressed to ASUP.

POS (POSITION REPORT)

Purpose

Report an aircraft's time over a reporting point, and aircraft intent information.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
X*	Reporting point and time, flight level, next point and ETA, [optional subsequent points which do not need to include time].
18	[Optional Other Information] following the RMK/ subfield [CSF/ subfield]

* The minimal information required is present position, time and flight level. The subsequent points may also include an ETA. The format of this non-ICAO field is X(2-11)/9999spA999spX(2-11)/9999[spX(2-11)/9999].

Example

(POS-KLM745-54N030W/1420 F350 54N040W/1511 54N050W-MET/MS51 310/36 MID 54N035W MS51 297/40 CHOP MTS CSF/CYQX RB EIAA R VAJC1421)

Position report for KLM745, weather information (both for 54N030W and the mid-point 54N035W), significant weather (moderate to severe chop) and communications information.

RBK (READBACK)

Purpose

To enable a controller to verify that a message to an aircraft has been correctly communicated.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
X	A copy of the controller's message read back by a flight crew member and any other information.
18	Subfields as necessary

Example

a) (RBK-BAW500-EGGX CLRSU TO KJFK VIA 57N10W 59N20W 60N30W 59N40W 58N50W PORGY HO M084F410 CSF/BAW500 RB EIAA R TD4PO)

Read back of a random track oceanic clearance issued by Prestwick Oceanic to BAW500.

b) (RBK-BAW500-LPPO CLR BWA500 CTAM F370 RL/RR-CSF/BAW500 RB LPAZ R TAJC1324)

Read back of a climb clearance issued to BAW500 by Santa Maria. Note the slightly different preamble used by LPPO. The aircraft is requested to report leaving its previous level and reaching the new level.

RCL (OCEANIC CLEARANCE REQUEST)

Purpose

To input an aircraft's request for an oceanic clearance.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
X*	Oceanic entry point [with Organised Track designators optional] and time, [requested cruising speed optional] and flight level(s) (may be expressed as 2 flight levels followed by the letter C for cruise climbs)
18	[Optional Other Information] following the RMK/ subfield [CSF/ subfield]

* The format of this non-ICAO field is X(2-11)/9999[spA999][spA999A999C] or [spA999][spA999]

Example

a) (RCL-BAW501-ERAKA/1012M084F330 NATC-RMK/PREFER ADJACENT TRACK AT F330 IF NOT AVAILABLE ON THIS ROUTE CSF/EIAA RB)

Oceanic clearance request by BAW501. Oceanic entry point is ERAKA; this is the initial fix on track Charlie. Aircraft signals preference for rerouting rather than flight level penalty.

b) (RCL-BAW501-41N015W/1012M084F330-RMK/REQ SEL CK ON ABCD CSF/LPAZ RB SEL CKD TAJC0945)

Oceanic clearance request for BAW501 on a random route commencing at 41N/15W. Aircraft requests and receives SELCAL check. The results are reported in the CSF sub-field. This use of the RMK sub-field isn't strictly necessary; the information in the CSF sub-field would have sufficed if phrased as SEL ABCD CKD

REQ (RECLEARANCE REQUEST)

Purpose

Used by an aircraft to request a re-clearance to speed, flight level or route.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
X*	Speed, or flight level, or speed and flight level, or position and flight level, or request re-routing (by sending the last unchanged route point followed by the new requested route to the oceanic exit point).
18	[Optional Other Information] following the RMK/ subfield [CSF/ subfield]

* The format of this non-ICAO field is A999 or A999A999 or 99N999W/A999.

Examples

a) (REQ-ACA851-M084-CSF/CYQX RB VAJC1324)

ACA851 requests re-clearance to maintain speed of Mach 0.84

b) (REQ-ACA851-F370-CSF/VAJC1324)

ACA851 requests re-clearance to climb or descend to flight level 370

c) (REQ-ACA851-M084F370-CSF/ CYQX RB VAJC1324)

ACA851 makes a combined request for a change in both speed and flight level

d) (REQ-ACA851-65N030W/F370-CSF/CYQX RB VAJC1324)

ACA851 makes a request for a change in flight level at a future position

f) (REQ-ACA851-63N020W 65N030W 66N040W 65N050W-CSF/CYQX RB VAJC1324)

ACA851 requests a rerouting after 63N020W. This message is only valid if the aircraft has not yet passed that position. The last point specified (65N/50W) must be on the previously cleared route to anchor the new route segments.

g) (REQ-ACA851-54N040W 52N050W YAY-CSF/CYQX RB VAJC1324)

ACA851 requests a rerouting after 54N040W. This message is only valid if the aircraft has not yet passed 54N/50W. Since the route is defined to the oceanic exit point a linkage to the previous route is not required.

h) (REQ-ACA851-F330-RMK/DUE TURBULENCE-CSF/CYQX RB VAJC1324)

ACA851 requests a flight level change and indicates reason for request.

RPE (REPORTED ESTIMATE)

Purpose

To advise of an aircraft estimate for a future reporting point.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
X*	Reporting point, estimated time, and [optional flight level].
18	[Optional Other Information] following the RMK/ subfield [CSF/ subfield]

* The format of this non-ICAO field is X(2-11)/9999[spA999]

Example

a) (RPE-BAW500-54N030W/1000 F350-CSF/CYQX RB VAJC1324)

Reported estimate message for Speedbird flight number 500, reporting new estimate over position 54N030W at time 1000 at flight level F350.

b) (RPE-KLM101-KORIB/1215-RMK/text CSF/CYQX RB VAJC1324)

Reported estimate message for KLM flight number 101, reporting new estimate over fix KORIB at time 1215.

SEL (SELCAL CODE)

Purpose

To inform an Aeradio Station of a flight's Selcal code.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification
18	Selcal Code following the SEL/subfield

Example

(SEL-BAW176-SEL/BADG)

SQK (SSR ASSIGNMENT)

Purpose

To transmit an SSR code assignment to an aircraft.

Message Format

ATS Field	Description
3	Message type, [DTSN]
7	Aircraft identification/SSR Code
18	[Optional Other Information] following the RMK/subfield

Examples

(SQK-TAP671/A3001)

RLS (REPORT LEVEL OR SPEED)

Purpose

Used by an aircraft to report leaving or reaching a level, or to confirm a speed change.

Message Format

ATS Field	Description
3	Message type
7	Flight ID
X*	Level or speed
18	[CSF/subfield]

* This field may contain a level, a speed, or both. A level may be followed by an "L", indicating the aircraft is leaving that level.

Examples

a) (RLS-TAPO33-F330-CSF/VAJC1235)

TAPO33 has reached F330.

b) (RLS-TAPO33-M084-CSF/VAJC1235)

TAPO33 is confirming a speed change to Mach 0.84.

c) (RLS-TAPO33-M084F330-CSF/VAJC1235)

TAPO33 has reached F330 and has changed speed to Mach 0.84.

LIST OF ACRONYMS

ACC	Area Control Centre
AFTN	Aeronautical Fixed Telecommunications Network
ATC	Air Traffic Control
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
DTSN	Data Transfer Serial Number
FDPS	Flight Data Processing System
ICD	Interface Control Document
NAT SPG	North Atlantic Systems Planning Group
OAC	Oceanic Area Control Centre
OLDI	On-Line Data-Interchange
SOTA	Shannon Oceanic Transition Area
UTC	Universal Coordinated Time
WGS/84	World Geodetic System 1984

– END –