

**AERONAUTICAL MOBILE COMMUNICATIONS PANEL (AMCP)**

**EIGHTH MEETING**

**Montreal, 4 to 13 February 2003**

**Agenda Item 5: Review of existing ICAO material on air/ground communication systems**

**AMSS SARPS — AMENDMENT PROPOSALS**

(Presented by the Rapporteur of WG-M)

**SUMMARY**

This paper contains amendment proposals to the AMSS SARPS (Annex 10, Volume III, Part 1, Chapter 4). These amendment proposals have been agreed by WG-M. Background information on these amendment proposals is available in the report of AMCP WG-M/5 (Appendix I to the Report of AMCP WG-M/5; available at website <http://www.icao.int/anb/panels/amcp>).

Action by the AMCP is in paragraph 2.

**1. INTRODUCTION**

1.1 This paper contains proposals for amendments to the Standards and Recommended Practices (SARPs) for aeronautical mobile-satellite service (AMSS) as a result of ongoing work and validation.

**2. ACTION BY THE AMCP**

2.1 The AMCP is invited to recommend that the amendments to the AMSS SARPs shown in the appendix to this working paper be incorporated in Annex 10.

-----

## APPENDIX

### PROPOSED AMENDMENT TO AMSS SARPS

#### NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT TO ANNEX 10, VOLUME III, PART I

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ **followed by the replacement text which is highlighted with grey shading.** new text to replace existing text

**ANNEX 10 — AERONAUTICAL TELECOMMUNICATIONS,  
VOLUME III — COMMUNICATION SYSTEMS**

**PART I — DIGITAL DATA COMMUNICATION SYSTEMS**

**CHAPTER 4. AERONAUTICAL  
MOBILE-SATELLITE SERVICE**

...

4.2.3.4 Receiver  
requirements

...

4.2.3.4.5 *Receiver Doppler rate.* The receiver shall be capable of acquiring and maintaining performance per 4.3.3 with a rate of change of frequency of 30 Hz per second.

4.2.3.4.6. *Receiver Interference Susceptibility.* Receivers meeting the requirements of these SARPs shall operate satisfactorily in the presence of interference at RF levels at the receivers input port not exceeding the following tabulated levels.

Frequency Range	Maximum Interference Level
470 to 1 450 MHz	+3 dBm
1 450 to 1 529 MHz	Decreases linearly in decibels from +3 dBm at 1450 MHz to -72 dBm at 1529 MHz
1 529 to 1 560 MHz	-163.3 dBm
1 560 to 1 626.5 MHz	Increases linearly in decibels from -72 dBm at 1560 MHz to +3 dBm at 1626.5 MHz.
1 626.5 to 1 660.5 MHz	+47.8 dBm
1 660.5 to 18 000 MHz	+3 dBm

...

4.2.3.5.7 *INTERMODULATION PRODUCTS*

...

4.2.3.5.7.4 For multicarrier AES, when transmitting two equal carriers with a total power equal to the maximum allowable operating EIRP of the AES, the power level of each of the intermodulation products shall not exceed the levels specified in Table 4-3 *bis*.

...

---

*Replace Table 4-3 with the following new  
Table 4-3 and new Table 4-3 bis*

---

**Table 4-3. Maximum harmonic, discrete spurious and noise density levels**

Frequency (MHz)	Power Density
0.01 to 1 525 <sup>1</sup>	-135 dBc/4 kHz
1 525 to 1 559	-203 dBc/ 4kHz
1 559 to 1 585	-155 dBc/MHz
1 585 to 1 605	-143 dBc/MHz
1 605 to 1 610	-117 dBc/MHz
1 610 to 1 610.6	-95 dBc/MHz <sup>5</sup>
1 610.6 to 1 613.8	-80 dBW/MHz <sup>5,7</sup>
1 613.8 to 1 614	-95 dBc/MHz <sup>5</sup>
1 614 to 1 626.5	-70 dBc/4 kHz <sup>3,5</sup>
1 626.5 to 1 660	-70 dBc/4 kHz <sup>2,3,4,5,6</sup>
1 660 to 1 660.5	-49.5 dBW/20 kHz <sup>2,3,5,6,7</sup>
1 660.5 to 1 670	-49.5 dBW/20 kHz <sup>4,5,7</sup>
1 670 to 1 735	-60 dBc/4 kHz
1 735 to 12 000	-105 dBc/4 kHz
12 000 to 18 000	-70 dBc/4 kHz

1. AMSS operations are permitted in the MMS (maritime) band which has been extended to include 1525-1530 MHz.
2. Within the transmit band, excluding the frequency band within  $\pm 35$  kHz of the carrier.
3. The  $-70$  dBc/4kHz spectrum level in this table is equivalent to  $(-70 - 10 \log(4000/SR))$  dBe (relative to the maximum envelope) under the definitions in Section 2.2.4.2.16.
4. For wide band spurious the limit is  $-39.5$  dBW/MHz.
5. This level is not applicable for intermodulation products.
6. The upper limit for the excess power for any narrow-band spurious emission (excluding intermodulation products) within a 30 kHz measurement bandwidth shall be 10 dB above the power limit in this table.
7. Note that the power density is expressed in terms of absolute power (dBW) in some instances, and in terms relative to carrier power (dBc) in other instances.

**Table 4-3 bis. Maximum Intermodulation Product levels**

Frequency MHz	IM Level
Below 1 610	<-70 dBc
1 610 to 1 614	-64 dBc
1 614 to 1 671.25	-24 dBc
1 671.25 to 1 711	-29 dBc
1 711 to 1 735	-34 dBc
1 735 to 18 000	<-70 dBc

End of new tables.

...

**Table 4-30. DTE effect on DCE restart states**

Packet received from DTE	DCE restart states (see Notes 6 and 7)		
	Packet layer READY (see Note 1) r1	DTE RESTART REQUEST (see Note 4) r2	DCE RESTART INDICATION (see Note 5) r3
Packets having a packet type identifier shorter than 1 octet with assigned logical channel identifier $\langle 0$	see Table 4-31	A = ERROR S = r3 D = 38 (see Note 3)	A = DISCARD
Packet supported by DCE other than restart with a logical channel identifier of 0	A = DIAG D = 36	A = DIAG D = 36	A = DIAG D = 36
Packet with a packet type identifier which is undefined or not supported by DCE and with assigned logical channel identifier $\langle 0$	see Table 4-31	A = ERROR S = r3 D = 33 (see Note 3)	A = DISCARD
Restart request, or restart confirmation packet with <del>an</del> assigned logical channel identifier $\langle 0$	see Table 4-31	A = ERROR S = r3 D = 41 (see Note 3)	A = DISCARD
Restart request	A = NORMAL (see Note 1 4.2) S = r2	A = DISCARD	A = NORMAL (4.23) S = p1 or d1 (see Note 2)
Restart Request confirmation	A = ERROR S = r3 D = 17 (see Note 8)	A = ERROR S = r3 D = 18 (see Note 3)	A = NORMAL (4.4) S = p1 or d1 (see Note 2)
Restart request or restart confirmation packet with format error	A = DIAG	A = DISCARD	A = ERROR

		DCE restart states (see Notes 6 and 7)	
Packet received from DTE	Packet layer READY (see Note 1) r1	DTE RESTART REQUEST (see Note 4) r2	DCE RESTART INDICATION (see Note 5) r3
	D = 38, 39, 81, or 82		D = 38, 39, 81, or 82 (see Note 3)
Call setup, call clearing, data; interrupt, flow control, or reset packet	see Table 4-31	A = ERROR S = r3 D = 18 (see Note 3)	A = DISCARD
Packets having a packet type identifier shorter than 1 byte and a logical channel identifier equal to 0	A = DIAG D = 38	A = ERROR S = r3 D = 38 (see Note 3)	A = DISCARD
Packet with a packet type identifier which is undefined or not supported by DCE and a logical channel identifier equal to 0	A = DIAG D = 33	A = ERROR S = r3 D = 33 (see Note 3)	A = DISCARD
<b>NOTES:</b>			
1. <del>Receipt of a restart request packet causes the DCE to issue a clear request packet to the IWF for each VC associated with the DCE entity. The AES subnetwork has no restart states. Receipt of restart request causes the DCE to respond with a restart confirmation. This restart request packet is forwarded to the IWF, which responds by executing a connection release procedure for each VC associated with the DTE/DCE interface. This is equivalent to the originating DTE separately issuing a clear request for each VC, i.e. the equivalent of a restart request.</del>			
2. The VC channels are returned to the state p1, the PVC channels are returned to state d1.			
3. <del>No action is taken by the DCE. The received packet is not forwarded to the IWF.</del>			
4. <del>The restart request packet is not forwarded to the IWF. If the DCE enters the r3 state, then the restart confirmation is not sent.</del>			
5. The DCE upon entering the r3 state, checks for the completion of r2 processing and issues an ISO 8208 restart indication packet to the DTE, <del>when the r2 processing.</del> If the r3 state is entered via the r2 state, the DCE discards the received packet and indicates a restart by transmitting to the DTE a restart indication packet with the cause 'local procedure error' and the appropriate diagnostic code. If the r3 state is not entered via the r2 state, the DCE performs all of the actions normally performed when entering r2 and issues an ISO 8208 restart indication packet to the DTE, and sends a clear restart request packet to the IWF (the equivalent of a clear request packet for each VC associated with the DCE entity).			
6. Table entries are defined as follows: A = action to be taken, S = state to be entered, D = diagnostic code to be used entered in packets to be generated as a result of this action, and discard indicates that the received packet is to be cleared from the buffers.			
7. The number in the parentheses below an "A = normal" table entry is the paragraph number in ISO 8208, second edition. The DCE shall take the same action as the one taken by the DTE, acting as a DCE, to perform nominal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.			
8. The error procedure consists of entering the r3 state and sending a restart indication packet to the DTE.			

**Table 4-34. DTE effect on DCE flow control transfer states**

Packet received from DTE	DCE flow control transfer states (see Note 2)	
	DCE RECEIVE READY f1	DCE RECEIVE NOT READY f2
DATA packet with invalid PR	A = ERROR S = d3 D = 2 (see Note 4)	A = ERROR S = d3 D = 2 (see Note 4)
DATA packet with valid PR but invalid PS or user data field with improper format	A = ERROR S = d3 D = (see Note 5) (see Note 4)	A = DISCARD (process PR data)
DATA packet with valid PR with M-bit set to 1 when the user data field is partially full, or the D-bit is set to 1 (when not supported)	A = ERROR S = d3 D = 165 or 166 (see Note 4)	A = DISCARD (process PR data)
DATA packet with valid PR, PS and user data field with proper format	A = NORMAL (forward)	A = DISCARD (process PR data) (see Note 7)
Packet received from DTE	DCE flow control transfer states (see Notes 1, 2 and 3)	
	DTE RECEIVE READY g1	DTE RECEIVE NOT READY g2
RR; or RNR packet with a valid PR (see Note 6) <del>invalid PR</del>	A = ERROR S = d3 D = 2 (see Note 4)	A = ERROR S = d3 D = 2 (see Note 4)
RR packet with a valid PR (see Note 6)	A = NORMAL (4.7.1.5)	A = NORMAL (4.7.1.5) S = g1
RNR packet with a valid PR (see Note 6)	A = NORMAL (4.7.1.6) S = g2	A = NORMAL (4.7.1.6)
<b>NOTES:</b>		
1. The RR and RNR procedures are a local DTE/DCE matter and the corresponding packets are not forwarded to the IWF.		
2. Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, and discard indicates that the received packets <del>is</del> <b>are</b> to be cleared from the buffers.		
3. The number in parentheses below an "A = normal" table entry is the paragraph number in ISO 8208, second edition. The DCE shall take the same action as those taken by the DTE to perform normal processing on the received packet. If no		

paragraph is referenced, the normal processing is defined in the table entry.

4. The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a reset indication packet to the DTE) and sending a reset request packet to the IWF.
5. The diagnostic codes are as follows: D = 1 for invalid PS; D = 39 for a user data field greater than 128 octets; D = 82 for a user data field not octet aligned.
6. For RR; ~~and RNR; or REJECT~~ packets, the presence of one or more octets beyond the third octet is considered an error. Although a valid P(R) may be accepted to update the status of outstanding data packets, the DCE shall invoke the error procedure as defined in Note 4 (with D = 39).
7. If possible, the DCE should process these packets normally. On the other hand, the DCE may define an internal mechanism to indicate that valid data packets have been discarded during a receive-not-ready condition. In this case, when the receive-not-ready condition clears, the DCE should reset the logical channel, forwarding both ~~the~~ the reset indication packet to the DTE (D=0, no additional information) and a reset request packet to the IWF.

— END —