

RTCA Special Committee 209
ATCRBS / Mode S Transponder MOPS Maintenance

Meeting #7

In Joint Session with Eurocae WG-49

Eurocontrol Headquarters, Brussels
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Proposed Change to DO-181D and ED-73C for
Higher Squitter Rates at Lower Power
(Revised during the Joint Session with Collective Agreement)

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SUMMARY

At the ICAO ASP meeting in Kobe, the Technical Subgroup (TSG) was tasked to develop SARPs material to specify limits on the MILACAS-FR use of higher squitter rates at lower power. Working Paper ASP02-14 was presented to the ICAO ASP Working Group during the Brussels meeting in April 2007 detailing the SARPs change required. That proposed change was accepted as a SARPs change and this Working Paper proposes the appropriate changes to the transponder MOPS documents, DO-181D and ED-73C in order to be consistent with the SARPs change.

1.0 Background

At the April 2007 ICAO ASP WG meeting, MILACAS-FR's use of higher squitter rates at lower power for DF=19 squitters, as well as the use of UF=19, was approved and the ICAO SARPs were proposed to be amended.

2.0 Proposed Change Proposal (CP)

This is a proposed CP to specify the operation of higher squitter-rate low power DF=19 operation, as well as the transmissions of UF=19 interrogations.

The proposed requirements provide for:

- a. Use of full power as well as lower power DF=19 transmissions, provided that the total power rate stays within the specified limit,
- b. Averaging over 10 seconds since some of the DF=19 transmissions occur in bursts once every ten seconds.

Background: Military use of DF=19 squitters to support military datalink applications would be enhanced by the option to use higher squitter rates at lower transmit powers, as well as the ability to transmit UF=19 interrogations.

Need for change:

The MILACAS-FR system transmits DF=19 extended squitters at a higher rate but at a significantly lower power.

Title: Change Pages to MOPS DO-181D and ED-73C

- a. to Allow Higher DF=19 Squitter Rates at Lower Power,**
- b. to Expand the Definition of Format 19 (MILACAS-FR)**
- c. to Align MOPS with proposed changes to ICAO ANNEX 10 Volume IV.**

List of section to change:

DO-181D	ED-73C
Update §2.2.14.1, Figures 2-4 and 2-5	Update §3.24, Figures 3-3 and 3-4
Update §2.2.14.4.3 AF Application Field	Definition of AF Application Field missing from §3.18.4 and should be added
Update §2.2.23.5 Extended Squitter Maximum Transmission Rate	Updates to §3.21.2.6.3
Add §2.2.23.5.1 Downlink Format 19 Extended Squitter Maximum Transmission Rate	Needs to be added, probably in §3.21.2.6.3

NOTE: The following changes are specified in the form of DO-181D paragraphs, and can be correlated to ED-73C using the table above.

2.2.14.1 Format Structure, Interrogation and Reply

For **Figure 2-4**, update the table of Uplink Formats (UF)

for UF=19 to show the following:

Format #	UF					Military Extended Squitter
19	1 0011	AF : 3	Military Application : 104			

For **Figure 2-5**, update the table of Downlink Format (DF)

for DF =19 to show the following:

Format #	DF					Military Extended Squitter
19	1 0011	AF : 3	Military Application : 104			

2.2.14.4.3 AF Application Field

Current Requirement:

This 3-bit (6-8) downlink field in DF=19 **shall** be used to define the format of the 112-bit transmission.

Code 0 = ADS-B Format

Code 1 to 7 = Reserved

Change to be:

This 3-bit (6-8) downlink field in DF=19 **shall** be used to define the format of the 112-bit transmission.

Code 0 = ADS-B Format

Code 1 = Military ACAS – Formation Flight System

Code 2 to 7 = Reserved

2.2.23.5 Extended Squitter Maximum Transmission Rate

Current Requirement:

The maximum total number of Extended Squitters (DF =17, 18 or 19) emitted by any Extended Squitter installation shall not exceed 6.2 per second.

Change to be:

The maximum total number of Extended Squitters (DF =17, 18 or 19) emitted by any Extended Squitter installation shall not exceed 6.2 per second.

Note: For installations capable of emitting DF=19 squitters, transmission rates for lower power DF=19 squitters are limited to a peak of 45 DF=19 squitters per second, and 35 DF=19 squitters per second averaged over 10 seconds, provided that the maximum total squitter power-rate product for the sum of full power DF=17 squitters, full power DF=19 squitters, and lower power DF=19 squitters, is maintained at or below a level equivalent to the power sum of 6.2 full power squitters per second averaged over 10 seconds. This low-power, higher squitter rate capability is intended for limited use by State aircraft in coordination with appropriate regulatory bodies.