

**RTCA Special Committee 186 Working Group 5**

**UAT MOPS**

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**Results on the DME usage of the frequencies 978 –982 MHz in Europe**

Prepared by N. Fistas,  
(data provided by A. Astorino, A. Miuccio, and G. Gulean)

EUROCONTROL

**SUMMARY**

This paper discusses the current and planned usage of the DME frequencies 978 - 982 MHz in Europe.

## 1. Introduction

UAT is one of the candidate datalinks, which are considered in relation to ADS-B services. UAT has not been allocated as yet a dedicated frequency. In the UAT trials that have taken place, the frequency 966 MHz has been used. In the past period, FAA has proposed and supported the consideration of the frequency 981 MHz. Recently the frequencies 978 and 979 MHz have also been discussed as these two frequencies are used as testing frequencies in USA and there seems to be no allocation in USA (RTCA SC186/WG5/WP-2-09).

The considered frequencies fall in the UHF ARN band and they are used by DME and TACAN systems. DME systems are usually coupled with other navigation aids in other ARN bands such as VOR, ILS or MLS systems. The coupling correspondence with VHF as well as MLS channels is described by ICAO (Annex 10, Volume I, Chapter 3, Table A) in the following table.

DME channel number	DME interrogation frequency	DME ground reply frequency	VHF paired frequency	MLS paired channel number
17X	1041 MHz	978 MHz	108.0 MHz	-
18X	1042 MHz	979 MHz	108.1 MHz	500
18W	1042 MHz	979 MHz	-	501
19X	1043 MHz	980 MHz	108.2 MHz	-
20X	1044 MHz	981 MHz	108.3 MHz	502
20W	1044 MHz	981 MHz	-	503
21X	1045 MHz	982 MHz	108.4 MHz	-

**Table 1: DME/VHF/MLS channel pairing**

The objective of this paper is to present the results of a preliminary investigation on the usage of these frequencies in Europe. It is understood that the operation of UAT in a DME channel would imply that also the adjacent channels would have to be vacated.

## 2. Usage in Europe of the DME channels 978-981 MHz

In the EUR region the frequency relating information on the different navigation aids is stored in the COM3 tables which are maintained by the ICAO Paris office. These tables register the existing and planned usage of all aeronautical frequency assignments. However, since the maintenance of this database is not optimum, the information contained in these tables is not always accurate. Therefore this investigation can only be indicative of the DME channel assignment status. Nevertheless, this information has been checked with other sources for validation purposes.

Table 2 shows the results of the investigation:

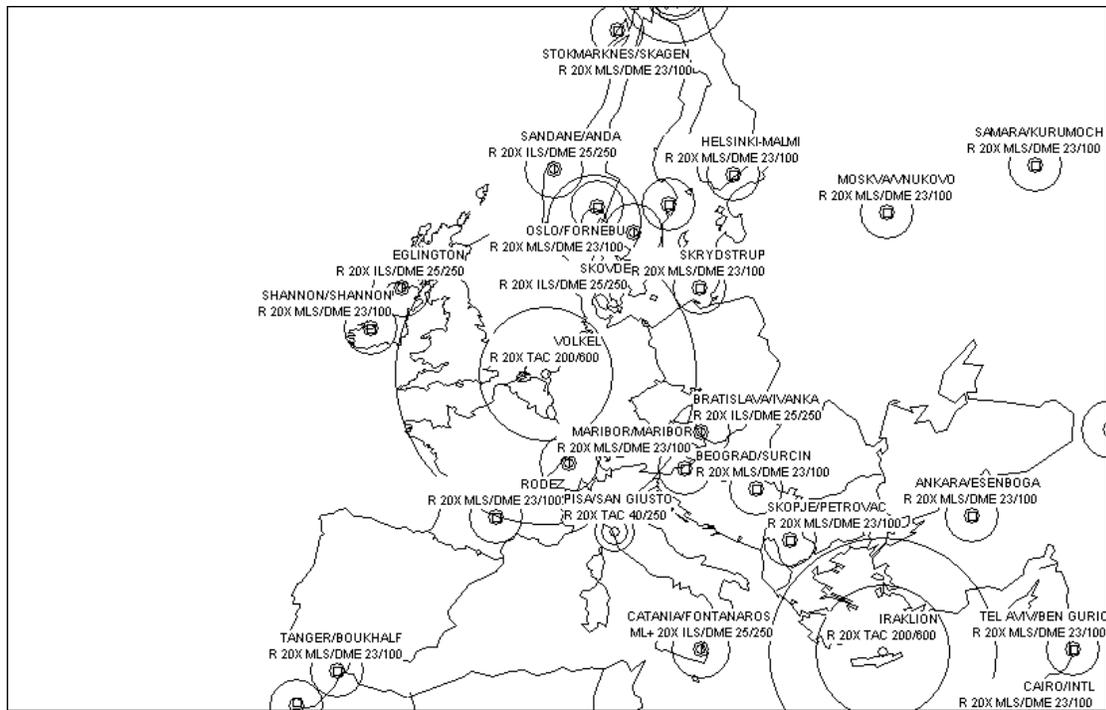
	17X	18X	19X	20X	21X
	978 MHz	979 MHz	980 MHz	981 MHz	982 MHz
COM3 tables	7 entries	54 entries	8 entries	29 entries	9 entries
Other databases	5 entries	22 entries	7 entries	9 entries	8 entries

**Table 2: DME channel assignments in Europe in the 978-982MHz band**

These entries correspond to many different types of equipment. In particular for the COM3 database there are 2 DME, 11 VOR/DME, 23 ILS/DME, 29 TACAN, 49 MLS/DME, and 2 ILS/MLS/DME systems. In terms of geographical coverage the above entries are spread throughout the European area and are registered by more than 25 countries.

By comparing the results from the different databases, it is obvious that the results match for the channels 17X, 19X and 21X, but there is a significant difference for the channels 18X and 20X. The main difference between the COM3 database and the other databases is that COM3 tables include planned assignments, whereas the other databases correspond to the current operational assignments. The greatest part of the difference in the numbers between the databases accounts for the MLS/DME assignments.

As an example, Figure 1 illustrates the DME assignments for the 20X channel across the EUR region.



**Figure 1: Usage of DME channel 20X in the EUR region**

In Figure 2, the usage of 19X and 21X channels in the same region is depicted.



**Figure 2: Usage of DME channel 19X and 21X in the EUR region**

### 3. Conclusions

This paper examined the European usage of the DME channels that are registered in the 978-982 MHz band. The search of the European navigation databases has revealed a significant number of assignments in the 978-982MHz bands. In addition many of these assignments are paired with frequencies in other ARN bands and correspond to operational collocated facilities (ILS/VOR and DME).