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CCITT

THE INTERNATIONAL
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CONSULTATIVE COMMITTEE

M.1160

(10/92)

MAINTENANCE: MOBILE SYSTEMS

**AERONAUTICAL MOBILE
TELECOMMUNICATION SERVICE
VIA SATELLITE**



Recommendation M.1160

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation M.1160 was revised by Study Group IV and was approved under the Resolution No. 2 procedure on the 5th of October 1992.

CCITT NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

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Recommendation M.1160

AERONAUTICAL MOBILE TELECOMMUNICATION SERVICE VIA SATELLITE

(1992)

Abstract: This Recommendation describes special maintenance requirements for the Aeronautical Mobile-satellite Service.

Keywords: Satellite Aeronautical Mobiles, Maintenance Aspects, INMARSAT-Aero System.

1 Purpose

The purpose of this Recommendation is to describe the special maintenance procedures and facilities that are required for the maintenance of aeronautical mobile telecommunication system via satellite. Wherever possible the standard maintenance procedures and facilities specified in the M and O-Series Recommendations, and appropriate X-Series Recommendations for data should be followed for the maintenance of these systems.

2 Available services

This system is intended for the provision of telephone and data communication services to and from aircraft. The range of possible applications for these services include airline crew and passenger communications (public correspondence), airline operations communications, traffic control services and distress urgent/safety calls.

3 System configuration

Aeronautical satellite system

The major elements of the aeronautical satellite system are as follows (see Figure 1/M.1160)

- a) the space segment including satellites (one for each ocean region);
- b) the network coordination station (NCS) for each satellite region;
- c) aeronautical ground earth stations (GES) or land earth stations (LES);
- d) aircraft earth stations (AES).

3.1.1 space segments

The space segment comprises the satellite communications transponder for each ocean region and associated frequency bands assigned for use by the aeronautical mobile-satellite system. The ocean regions are the Atlantic East, the Atlantic West, the Pacific and the Indian Ocean.

3.1.2 aircraft earth station(AES)

Aircraft earth station interfaces with the space segment (at L-band) for communications with aeronautical ground earth stations, for the purpose of setting up communication with the existing airborne equipment, and with crew and passenger telephone equipment, in accordance with the relevant technical and operational requirements.

3.1.3 aeronautical ground earth station (GES)

Aeronautical ground earth station interface with the space segment (at C-band and L-band) and with the fixed networks. It operates in accordance with the relevant technical and operational requirements for communications with AESs.

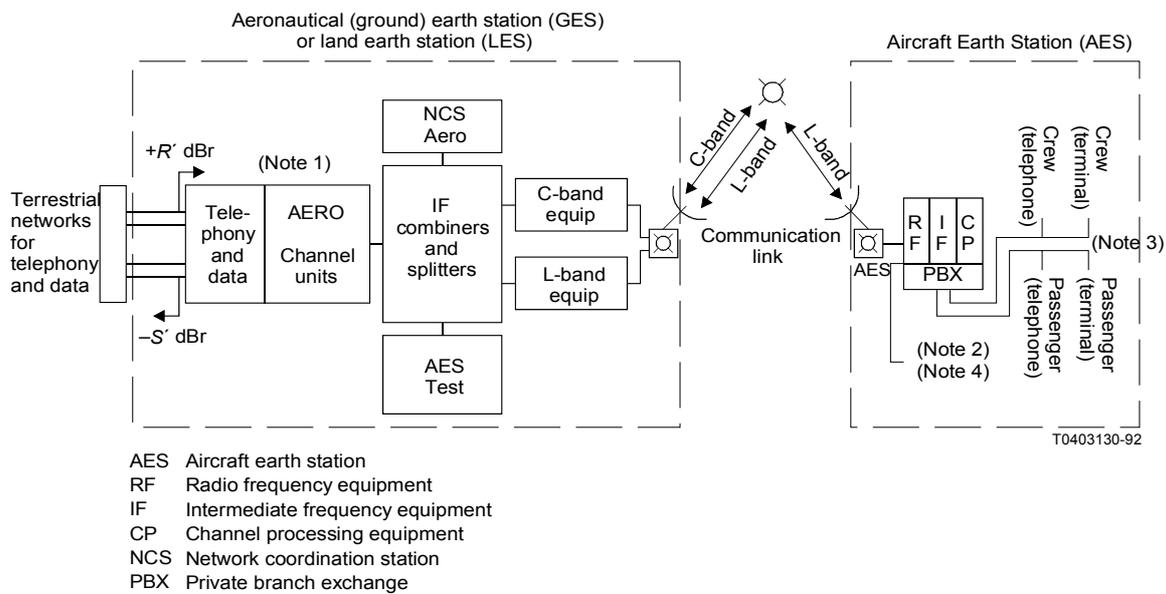


FIGURE 1/M.1160

Configuration of an aeronautical GES and Aircraft Earth Station

3.1.4 test terminal (TT)

A test terminal is an aircraft earth station installed at an aeronautical ground earth station that is used for test purposes.

3.1.5 network coordination station (NCS)

Each ocean region is served by an NCS which manages common space segment resources and controls access of the AES to the system. It can be independent of the GES or co-located at designated ground earth stations. Network coordination station interfaces via the space segment (at C-band and L-band) with the GESs for the purpose of managing a common pool of satellite channels. Alternatively, NCS functions may be incorporated into designated GESs of a region until a full NCS becomes operational for that region.

3.2 *Interconnection with the international public switched telephone/data network*

The circuit between the international switching centre (ISC) and aeronautical ground earth station is considered as equivalent to an international public switched telephone/data circuit. (Configuration for the data circuit may need further study.)

4 General maintenance principles

In an international connection which includes an aeronautical earth station, the aeronautical satellite system may be regarded, from a transmission point of view, as a national network. Nevertheless, it should be noted that the aeronautical satellite circuit is set up between the aeronautical ground earth station and the aircraft earth station on a demand assignment basis. Therefore, an aeronautical ground earth station in the aeronautical satellite system may not have direct or full responsibility for the maintenance of a particular aeronautical satellite circuit and a particular aircraft earth station all of the time. The operation and maintenance of the overall aeronautical satellite system is the responsibility of the aeronautical satellite system operator, e.g. INMARSAT.

The maintenance organization in each participating Administration is, in general, responsible for the maintenance of the aeronautical satellite circuit.

5 Lining-up and maintaining public switched telephone/data circuits

The circuit between the international switching centre (ISC) and the aeronautical ground earth station should be lined up and maintained in accordance with those M-Series Recommendations appropriate to international public switched telephone/data circuits.

6 Lining-up and maintaining aeronautical satellite circuits

6.1 *Control, sub-control and responsibilities*

6.1.1 *General*

The assignment of control and sub-control stations and respective responsibilities must address the configuration of the aeronautical satellite system. A control station must be assigned as regards circuits, and, in addition, sub-control stations as required for efficient maintenance.

6.1.2 *Assignment of control stations*

The aeronautical ground earth station is the control station for the aeronautical satellite circuit.

6.1.3 *Assignment of sub-control stations*

The aircraft earth station is the sub-control station for the aeronautical satellite circuit. However, the required staff and facilities may not be available to meet the circuit sub-control responsibilities.

6.1.4 *Responsibilities of control and sub-control station*

Control stations dealing with aeronautical satellite circuit should fulfill the responsibilities of control stations as defined in the M-Series Recommendations. The same applies to sub-control stations.

6.2 *Transmission characteristics*

6.2.1 *Telephone service*

Under study.

6.2.2 *Data service*

Under study.

6.3 *Lining-up procedures*

6.3.1 *Telephone circuit*

Under study.

6.3.2 *Data circuit*

Under study.

6.4 *Fault reporting procedures*

Fault report points (circuit) should be identified in accordance with Recommendation M.715 [1].

Fault report points (network) should be identified in accordance with Recommendation M.716 [2]. One such point is required for the aeronautical satellite system and is assigned to the operations control centre. However, general international networking problems should in the first instance be referred to the fault report points (network) concerned.

Exchange of contact point information should be in accordance with Recommendation M.1510 [3].

6.5 *Maintenance procedures*

It is desirable that the routine measurements on the aeronautical satellite circuits to be performed to confirm that the transmission parameter limits continue to be maintained. These maintenance procedures are important with respect to the aeronautical ground earth station transmission performance.

References

- [1] CCITT Recommendation M.715 *Fault report point (circuit)*.
- [2] CCITT Recommendation M.716 *Fault report point (network)*.
- [3] CCITT Recommendation M.1510 *Exchange of contact point information for the maintenance of international services and the international network*.
- [4] CCITT Recommendation F.127 *Operational procedures for interworking between the telex service and the service offered by INMARSAT Standard-C system*.
- [5] CCITT Recommendation X.25 *Interface between data terminal equipment (DTE) and data-circuit terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit*.
- [6] CCITT Recommendation M.1140 *Maritime mobile telecommunication services via satellite*.

