



INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

M.1140

(10/92)

MAINTENANCE: MOBILE TELECOMMUNICATIONS SYSTEMS AND SERVICES

MARITIME MOBILE TELECOMMUNICATION SERVICES VIA SATELLITE



Recommendation M.1140



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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.1140 was prepared 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.1140

MARITIME MOBILE TELECOMMUNICATION SERVICES VIA SATELLITE

(1992)

Abstract: This Recommendation describes general maintenance aspects of satellite maritime mobile systems predominantly based on INMARSAT-A maintenance requirements.

Keywords: Satellite Maritime Mobile, Maintenance Aspects, INMARSAT-A.

1 Purpose

The purpose of this Recommendation is to describe general maintenance aspects of satellite maritime mobile systems and define interrelationship and interworking issues of such systems with terrestrial voice and data networks taking into consideration criteria, procedures and facility standards specified in the M- and O-Series Recommendations.

This Recommendation is predominantly based on the maintenance requirements of the INMARSAT-A maritime satellite system which is the prevailing operational maritime service. Other maritime systems such as the digital INMARSAT-C, -B and -M will be addressed in Recommendations, specific to each type. However, the following sections are equally relevant to other INMARSAT maritime systems.

2 General maintenance aspects of satellite maritime mobile systems

2.1 Definitions

2.1.1 maritime mobile service via satellite

Mobile service via satellite in which mobile earth stations are located on-board ships. This can include mobile earth stations on-board rescue vessels and radio buoys (or other devices) used to locate shipwrecks.

2.1.2 maritime satellite system

In the maritime mobile-satellite service, all of the temporary connections between a telephone at a ship earth station (SES) and the maritime virtual switching point at a coast earth station (CES) constitutes a maritime satellite system. It comprises a maritime satellite circuit and a maritime local system. The general arrangement is shown in Figure 1/M.1140.

2.1.3 maritime satellite circuit

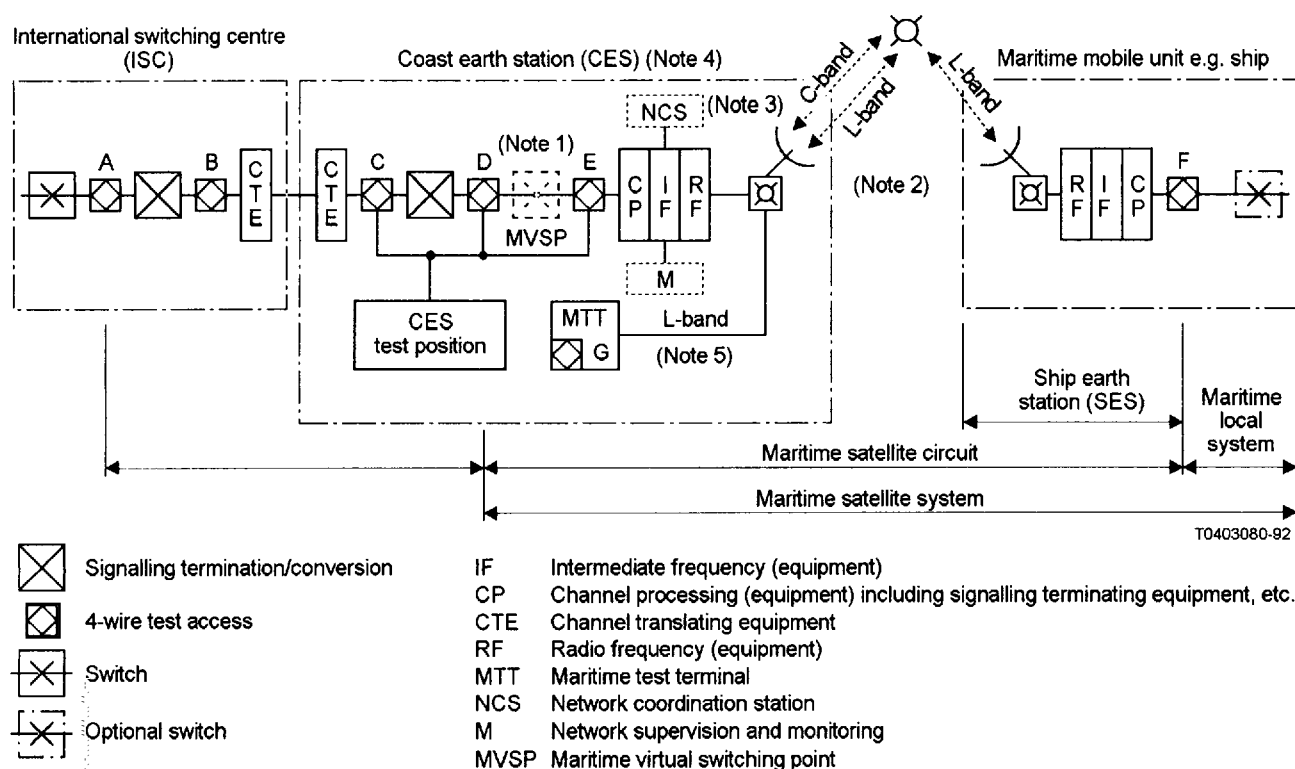
Maritime satellite circuit is a 4-wire circuit between a maritime virtual switching point at a coast earth station and the 4-wire circuit test access point at a ship earth station, via a satellite repeater.

2.1.4 maritime local system

All the equipment between the 4-wire test circuit access point on a ship earth station and a 2-wire or 4-wire telephone served by that ship earth station constitutes a maritime local system. It may include 4-wire to 2-wire termination sets, echo control equipment, data interfaces, and 4- or 2-wire switching devices.

2.1.5 ship earth station (SES)

A ship earth station in the maritime mobile-satellite service is a mobile earth station which provides a 4-wire analogue interface for connection of a maritime satellite circuit to a maritime local system and a 4-wire circuit test access point.



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Note 1 – A maritime virtual switching point should always be established for transmission planning purposes. However, a switch at the coast earth station is optional.

Note 2 – The actual frequencies used are 4/6 GHz (C-band) and 1.5/1.6 GHz (L-band).

Note 3 – Certain coast earth stations are also network coordination stations; their functions are described in § 3.1.3.

Note 4 – Coast earth station functions are described in § 4.1.

Note 5 – 4-wire test access point G is equivalent to 4-wire test access point F.

FIGURE 1/M.1140

Constitution of a maritime satellite system (INMARSAT-A)

2.1.6 coast earth station (CES)

A coast earth station in the maritime mobile-satellite service is an earth station, which provides a 4-wire analogue interface for connection of a maritime satellite circuit to the international public switched telephone network. It also provides circuit test access points and test facilities. (See § 4.1 for the functions of a coast earth station.)

2.1.7 maritime test terminal (MTT)

MTT is a ship earth station along with a maritime local system installed at a coast earth station and used for test purposes.

2.1.8 network coordination stations (NCS)

A network coordination station in the maritime mobile-satellite service maintains a pool of frequencies, assigns frequencies on demand from a coast earth station for temporary use in a maritime satellite circuit, and supervises and monitors the use of the frequencies. The network coordination station is normally located at a coast earth station which is designated by the satellite system operator to fulfill these functions. (See § 3.1.3 for the functions of a network coordination station.)

2.1.9 coast earth station test position

A coast earth station test position is used to originate test calls over the maritime satellite system to the maritime test terminal and to receive test calls from the maritime test terminal.

2.2 General maintenance principles

2.2.1 Responsibilities

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

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

2.2.2 Available services

The maritime satellite systems in service provide telex services to maritime mobile units in addition to telephone, facsimile and voice-band data services. When setting-up maintenance procedures, Administrations should consider the utilization of these services for communication, diagnostic and maintenance purposes, and should also consider that trained technical staff are generally available at the ship earth station only at the time the ship earth station is commissioned; however, the ship earth station is usually operated by a qualified radio officer who may be only able to assist in carrying out simple test procedures.

Special services, high speed data services, and compressed video are being provided over the maritime satellite systems. The development of new maintenance procedures to support these services will be the subject of future study.

2.3 Interconnection with the international public switched telephone network

Interconnection arrangements are considered with reference to Figure 1/M.1140.

The maritime virtual switching point at the coast earth station is considered to be the interface between test access points D and E (see Figure 2/M.1140). The circuit between the international switching centre (ISC) and coast earth station is considered as equivalent to an international public switched telephone circuit.

2.4 Lining-up and maintaining international public switched telephone circuits

The circuit between the international switching centre and the coast earth station in Figure 1/M.1140 should be lined up and maintained in accordance with those M-Series Recommendations appropriate to international public switched telephone circuits, e.g. Recommendations M.580 [1] and M.610 [2].

2.5 Lining-up and maintaining maritime satellite circuits

2.5.1 Control, sub-control and respective responsibilities

2.5.1.1 General

The assignment of control and sub-control stations and respective responsibilities must address the configuration of the maritime satellite system. In every case a control station must be assigned for each circuit, and, in addition, sub-control stations are required for efficient maintenance.

