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Recommendation E.214

STRUCTURE OF THE LAND MOBILE GLOBAL TITLE

FOR THE SIGNALLING CONNECTION CONTROL PART (SCCP)

1 Introduction

In order to permit land mobile stations to roam, there is a need to transfer information, e.g. the mobile station roaming number between Public Land Mobile Networks (PLMNs). This transfer of information can be accomplished by the use of Transaction Capabilities (TC) and the SCCP of Signalling System No. 7.

When a land mobile station roams to a foreign PLMN, it registers with a Visited Location Register (VLR) within that PLMN. The only information available to the VLR to address the mobile’s Home Location Register (HLR) is its International Mobile Station Identity (IMSI).

The purpose of this Recommendation therefore is to define the structure of the mobile global title used in SCCP addressing to the public land mobile service, and to establish the relationship between the mobile global title and the international mobile station identity as defined in Recommendation E.212.

2 Considerations

The considerations which form the basis of the Mobile Global Title (MGT) for the land mobile service are as follows:

2.1 The MGT shall be derived from the international mobile station identity in a simplified manner.

2.2 There could be a number of PLMNs in a country.

2.3 The MGT shall permit the identification of the country as well as the PLMN in which the mobile station is registered.

2.4 The MGT should, as an option, permit the identification of the home location register (HLR) of the mobile station.

2.5 The length of the MGT should be minimized.

2.6 The MGT should enable the fixed network exchanges to utilize existing routing information in order to identify the PLMN.

2.7 Recommendations E.163, E.164, E.165, E.212 and E.213 are applicable.

3 Global title principles

3.1 *Structure of the mobile global title*

The mobile global title is of variable length and composed of decimal digits arranged in two specific parts. These specific parts are the E.164 and the E.212 part.

The E.164 part is used to identify the country and the PLMN, or PLMN and HLR, where the mobile station is registered. To accomplish this, the E.164 part comprises a Country Code (CC), as defined in Recommendation E.163, and a Network Code (NC) which can be the National Destination Code (NDC), as defined in Recommendation E.164, or the NDC and some additional E.164 digits. The NC would identify the PLMN or HLR within the PLMN. The number of E.164 digits required for identification may vary from network to network, and must be established by bilateral agreement.

The E.212 part is used to identify the mobile station or mobile station and HLR and is composed of the mobile station identification number as defined in Recommendation E.212.

Figure 1/E.214 shows the structure of the mobile global title.

Figure 1/E.214, p.

3.2 *Derivation of the mobile global title from the international mobile station identity (IMSI)*

The MGT is derived from the IMSI (Recommendation E.212) in the manner shown in Figure 2/E.214.

Figure 2/E.214, p.

Within the MGT the CC is derived directly from the MCC and the NC is derived either directly from the MNC, or from the MNC and some initial digits of the MSIN. The MSIN is mapped directly into the MGT, up to its maximum length.

3.3 *Length of mobile global title*

The Mobile global title will be of variable length but with a maximum of 15 digits. Therefore, if necessary, the least significant digits of the MSIN will be omitted in order to conform with the maximum length of the MGT.

3.4 *Analysis of the mobile global title*

In order to permit fixed network nodes to utilize existing resources, digit analysis in the originating country will conform to Recommendation E.164. See also Recommendation E.165.

Further analysis beyond this requirement shall be by bilateral agreement.

The analysis of the E.212 part of the mobile global title in the destination fixed network is a national matter.

Recommendation E.215

TELEPHONE/ISDN NUMBERING PLAN

FOR THE MOBILE-SATELLITE SERVICES OF INMARSAT

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1 Introduction

1.1 *Purpose*

The purpose of this Recommendation is to specify a telephone/ISDN numbering plan for mobile earth stations in systems operated by the International Maritime Satellite Organization (INMARSAT). Such systems may include maritime and aeronautical satellite systems. In the future the range of mobile satellite systems may also include satellite systems for other applications.

1.2 *Terminology*

The telex numbering plan for INMARSAT is contained in Recommendation F.125. Recommendations E.215 and F.125 are designed to be as similar as possible.

The following terms are used in this Recommendation.

1.2.1 **ship station identity**

As defined in the Radio Regulations, Appendix 43. See also Recommendation E.210.

1.2.2 **INMARSAT mobile international number**

The number following the international prefix which identifies terminal equipment connected to an *INMARSAT* mobile earth station for access from a public network.

1.2.3 **INMARSAT mobile number**

The part of the *INMARSAT* mobile international number which follows a country code allocated to the INMARSAT system.

1.2.4 *Other definitions*

For definition of terms such as maritime mobile-satellite service, aeronautical mobile-satellite service, ship earth station, etc., see the Radio Regulations.

1.2.5 *On-board identification digits*

These digits are the part of the mobile earth station number used for identifying:

— a specific terminal equipment on board;

— a specific mobile earth station.

1.3 *Basic considerations*

The considerations which form the basis of the numbering plan are:

1.3.1 that it shall be possible to identify an *INMARSAT* mobile earth station uniquely from the *INMARSAT mobile number* ;

1.3.2 that the *INMARSAT mobile number* should have a format where the same number could be used for access from all types of public networks;

1.3.3 that the number of three-digit country codes required for supporting future INMARSAT requirements should be as few as possible;

1.3.4 that different routings could be used for calls to mobile earth stations designed to different INMARSAT system standards;

1.3.5 that Administrations and INMARSAT could apply different charging and accounting rates to different INMARSAT system standards;

1.3.6 that the numbering plan should provide capacity for on-board identification or direct access to a specific terminal equipment connected to a mobile earth station, e.g. on board a ship;

1.3.7 that the numbering plan should support access to multi-channel mobile earth stations;

1.3.8 that the new mobile earth station numbering plan should incorporate numbering plan(s) already in use for the INMARSAT Standard-A system;

1.3.9 that the length of the *INMARSAT mobile international number* | should comply with Recommendation E.164 (E.163) and will initially be limited to 12 digits (see also Recommendation E.165);

1.3.10 that, for maritime satellite applications, the ship earth station numbering plan should support access to several ship earth stations in the same ship within one *ship station identity* ;

1.3.11 that the radio regulations make provision for the allocation of additional MIDs for a specific country when necessary.

2 Format of INMARSAT mobile international number

The general format of the *INMARSAT mobile international number* | is:

$$CCC\ T\ X_1 . | \ | \ X_k$$

where CCC is a three-digit country code allocated to INMARSAT and $T_1 . | \ | \ | _k$ is the *INMARSAT mobile number* . The format of the *mobile earth station number* is given in § 4.

3 Telephone/ISDN country codes for INMARSAT applications

Telephone/ISDN country codes for INMARSAT applications are given in Table 1/E.215.

Table 1/E.215 [T1.215], p.

4 Format of INMARSAT mobile number

4.1 *General format*

The general format of the *INMARSAT mobile number* | is

$$T\ X_1 X_2 . | \ | \ X_k$$

where the digit T is used for discrimination between different INMARSAT systems.

The formats used for the various INMARSAT systems are defined below. The values of the T digits are summarized in Table 2/E.215.

The T digits represent a limited resource and a new T digit should therefore only be allocated when necessary for technical or operational reasons.

The CCITT Secretariat would be responsible for co-ordinating the allocation of new T digits with the competent Study Groups.

Table 2/E.215 [T2.215], p.

4.2 *Formats for INMARSAT Standard-A system*

4.2.1 *Ordinary calls*

The number format used for ordinary calls to ship earth stations in the INMARSAT Standard-A system is as follows:

$$1\ X_1X_2X_3X_4X_5X_6 \text{(7 digits)}$$

where 1 corresponds to the T digit and the digits $X_1X_2X_3X_4X_5X_6$ are allocated to ships by INMARSAT.

The length of the *INMARSAT mobile number* | will be 7 digits, making the length of the *INMARSAT mobile international number* equal to 10 digits.

4.2.2 *Group calls*

For group calls, the *INMARSAT mobile number* | takes the following format:

$$0\ X_1X_2X_3X_4X_5X_6X_7X_8 \text{(9 digits)}$$

where 0 corresponds to the T digit and X_1 through X_8 takes values as shown in Annex B.

The length of the *INMARSAT mobile number* | will be 9 digits making the length of the *INMARSAT mobile international number* equal to 12 digits.

4.2.3 *Access to special service terminations on board the ship*

In order to handle automatic data and facsimile calls in the INMARSAT Standard-A system, the following format is proposed (see also Recommendation E.216):

8 Y 1 $X_1X_2X_3X_4X_5X_6$ (9 digits)

where 8 corresponds to the T digit, the digits X_1 through X_6 take the same value as in § 4.2.1 and the digit Y determines the service termination. Table 3/E.215 lists the values of digit Y for various applications.

Table 3/E.215 [T3.215], p.

Note 1 — The *INMARSAT mobile international number* will then have the following format:

$$\text{CCC } 8 \text{ Y } 1 \text{ } X_1X_2X_3X_4X_5X_6 \text{(12 digits)}$$

Note 2 — The digits Y 1, etc. need not be analyzed in the international network for routing or charging purposes.

4.3 *Formats for INMARSAT Standard-B system*

4.3.1 *Ordinary calls*

For ordinary calls to ship earth stations in the INMARSAT Standard-B system, the format shall be initially:

$$3 \; {}_1I_2D_3X_4X_5X_6Z_1Z_2 \text{(9 digits)}$$

where 3 corresponds to the T digit and the digits $M_1I_2D_3X_4X_5X_6$ are the first 6 digits of the *ship station identity* MIDXXX000 (see Annex A). The digits Z_1Z_2 may be used for identifying terminal equipment connected to a ship earth station, for discriminating between channels of multi-channel ship earth stations and for discriminating between several ship earth stations on the same ship.

The length of the *INMARSAT mobile number* | will be 9 digits, making the length of the *INMARSAT mobile international number* equal to 12 digits.

Special requirements on the allocation of the digits Z_1Z_2 are given in Annex C.

The number format:

$$3 \; {}_1X_2X_3X_4X_5X_6Z_1Z_2 \text{(9 digits)}$$

where the digit X_1 may take the values 8 or 9 is reserved for future INMARSAT applications.

The length of the *INMARSAT mobile number* | will be 9 digits making the length of the *INMARSAT mobile international number* equal to 12 digits.

4.3.2 *Group calls*

For group calls the *INMARSAT mobile number* takes the following format:

$$3\ 0\ X_1X_2X_3X_4X_5X_6X_7$$

where the digits $0X_1$ through X_7 take values as shown in § B.2.3.

The length of the *INMARSAT mobile number* | will be 9 digits making the length of the *INMARSAT mobile international number* equal to 12 digits.

4.3.3 *Future extension of the number*

The *INMARSAT mobile number* may be extended to 12 digits when the number capacity of the international network is increased (see Recommendation E.165). This is for further study. Annex C proposes a method by which this expansion can be made in order to allow two number lengths to coexist on the same T digit.

4.4 *Format for INMARSAT Standard-C system*

4.4.1 *Ordinary calls*

For ordinary calls to ship earth stations in the INMARSAT Standard-C system, the format shall be initially:

$$4\ {}_1I_2D_3X_4X_5X_6X_7X_8 \text{(9 digits)}$$

where 4 corresponds to the T digit and where at least the digits $M_1I_2D_3X_4X_5X_6$ are part of the *ship station identity* digits X_7X_8 may also be part of the *ship station identity* or be used for discrimination between several ship earth stations on the same ship. In the latter case, X_7X_8 becomes Z_1 and Z_2 and the principle of Annex C should be followed.

The number format:

$$4\ {}_1X_2X_3X_4X_5X_6X_7X_8 \text{(9 digits)}$$

where the digit X_1 takes the values 8 or 9 is reserved for INMARSAT applications.

The length of the *INMARSAT mobile number* will be 9 digits, making the length of the *INMARSAT mobile international number* equal to 12 digits.

4.4.2 *Group calls*

For group calls, the *INMARSAT mobile number* takes the following format:

$$4\ 0_1X_2X_3X_4X_5X_6X_7$$

where the digits $0X_1$ through X_7 take values as shown in § B.2.3.

The length of the *INMARSAT mobile number* | will be 9 digits making the length of the *INMARSAT mobile international number* equal to 12 digits.

The group call facilities in the Standard-C system are described in Supplement No. 3 of Fascicle II.4.

4.4.3 *Future extension of the number*

For maritime satellite applications, the *INMARSAT mobile numbers* used in the INMARSAT Standard-C system may be extended to 12 digits when the numbering capacity of the international network is increased (see Recommendation E.165) in a way similar to those of the Standard-B system (see § 4.3.3). This is for further study.

4.5 *Format for INMARSAT aeronautical system*

The general format of numbers in the INMARASAT aeronautical system is as follows:

$$5\ {}_1X_2X_3X_4X_5X_6X_7X_8 \text{(9 digits)}$$

where 5 corresponds to the T digit.

The format of the digits X_1 through X_8 is still to be determined.

The length of the *INMARSAT mobile number* | will be 9 digits, making the length of the *INMARSAT mobile international number* equal to 12 digits.

4.6 *Future INMARSAT standard systems*

T digits should be allocated for each new INMARSAT standard system in the future. If an earlier system is taken out of service, T digits allocated for that system may be reallocated to new systems.

If the capacity provided by the T digits of Table 2/E.215 is not sufficient, then further capacity may be made available by using T = 9 followed by an additional digit (U) as follows:

$$9\ U\ X_1X_2.\ |\ |\ X_k$$

where the digits $X_1.\ |\ |\ X_k$ identifies the mobile earth station and any extension connected to it. The digit U is used to identify new INMARSAT systems or for technical and operational reasons.

The CCITT Secretariat would be responsible for co-ordinating the allocation of new U digits with the competent Study Groups.

5 Digit analysis

If different routing and/or accounting applies to different INMARSAT standard systems, then the digits CCCT need to be analyzed at international exchanges.

If the routing capacity is increased by using T = 9 (see § 4.6), then the digits CCC9U need to be analyzed.

The above requirements on number analysis are in compliance with Recommendations E.164 (E.163). See also Recommendation E.165.

The digits Y 1, etc., following CCC 8 (see § 4.2.3) need not be analyzed in the international network for routing or charging purposes.

6 Presentation of INMARSAT mobile numbers in directories

6.1 *General*

INMARSAT mobile numbers | may be published in separate directories or in separate sections of general directories.

In directories, only the *INMARSAT mobile numbers* , as specified in § 4.1, shall be listed. The country code to be used and instruction for the subscribers should be contained in general parts of the directories.

The use of digits 8 Y in the format for the INMARSAT Standard-A system in § 4.2.3 should also be explained in the general parts of the directories. This information should also include indications as to whether or not these numbers are accepted for calls to one or more ocean areas.

The subject on directories for mobile satellite services requires further studies.

ANNEX A
(to Recommendation E.215)

Use of
ship station identification for maritime applications

of systems operated by INMARSAT

A1 *General*

Appendix 43 of the Radio Regulations defines an international identification plan for ships participating in the maritime mobile services. The ship station identity consists of nine digits and is composed as follows:

$$M_1I_2D_3X_4X_5X_6X_7X_8X_9$$

where the digits $M_1I_2D_3$ determine the ship's nationality.

For ships participating in systems operated by INMARSAT, the main part of this Recommendation specifies a format of the *INMARSAT mobile number* as follows:

$$T\,X_1X_2.\,|\,|\,X_k$$

The purpose of the digit T is explained in § 4.

For maritime applications, the number can be regarded as being composed of three blocks as follows:

Table 4/E.215 [T4.215], p.

where the digit in block 1 is the digit T, the digits in block 2 are related to the ship station identity as explained below and block 3 contains digits which are used for other purposes (e.g. on-board identification). In some INMARSAT systems, block 3 may be empty.

Note 1 — For the INMARSAT Standard-A system, INMARSAT applies a ship numbering plan which is not related to the ship station identification plan of the Radio Regulations. In this numbering plan the digit T takes the fixed value T = 1.

Note 2 — For INMARSAT Standard-B and C systems, the digit X_1 may take either of the values 8 or 9 for future applications. In this case, the digits in block 2 are not related to the ship station identification plan.

A.2 *Constraints on ship station identification and numbering*

A.2.1 The present number capacity of the PSTN requires that the *INMARSAT mobile number* consist of 9 or fewer digits. When the number capacity of the PSTN/ISDN is increased to 15 digits, then the *INMARSAT mobile number* can consist of up to 12 digits.

Since the same *INMARSAT mobile number* should be used for telex and data transmission services, further constraints may be put on the number length.

A.2.2 The new numbering plan must cater for capabilities as follows:

— provision of a reasonable on-board identification capacity for calls to ship board terminal equipment connected to the ship earth station;

— possibility of several ship earth stations on the same ship where all ship earth stations have a number associated with the unique ship station identity of the ship;

— capability of supporting multi-channel ship earth stations.

These capabilities may require digits in block 3 of the *INMARSAT mobile number* , thus reducing the available space for block 2.

A.3 *Application of ship station identity*

A.3.1 *Digit capacity in block 2*

The INMARSAT Standard-A system can only support 6 digits in block 2 because of the addressing capacity on the radio path.

The addressing capacity of INMARSAT Standard-B and C systems on the radio path can cater for up to 9 digits in block 2. However, the limited digit capacity of the terrestrial networks puts the following initial constraints on the number of digits in block 2:

— for the INMARSAT Standard-B system, the initial digit capacity in block 2 is 6 digits to allow sufficient capacity in block 3 for supporting the capabilities listed in § A.2.2 above. In the future (see Recommendation E.165) the capacity of block 2 may be extended to 8 or 9 digits;

— for the INMARSAT Standard-C system, the initial digital capacity in block 2 is 6 digits to allow sufficient capacity in block 3 for supporting the possibility of identifying several terminal equipments connected to a ship earth station and of several ship earth stations on the same ship. In the future, the capacity of block 2 may be extended to 7 or more digits.

A.3.2 *Mapping between the ship station identity and the digits in block 2*

The mapping between the ship station identity and the digits in block 2 is shown in Table A-1/E.215.

Table A-1/E.215 [T5.215], p.

For ship earth stations, the ship station identity is thus derived from the digits in block 2 by adding 0s at the end until the identity consists of 9 digits.

In order to distinguish between *INMARSAT mobile numbers* consisting of 9 and 12 digits (if they coexist), the digit x_7 of the ship station identify (see Recommendation E.210) must take the fixed value 0. This constraint is *not valid* when only 12 digit numbers exist in the future (see also Annex C).

The digit T in block 1 determines the type of ship earth station and, implicitly, the number of digits in block 2. The relationship is shown in Table A-2/E.215. Further details of the number structure is given in the main part of the Recommendation.

A.3.3 *Ships equipped with several INMARSAT standard systems*

The ship station identity for such ships is the one derived from the ship earth station standard having the smallest size of block 2. This applies only if the numbering systems for the ship earth station standards are related to the ship station identification plan.

Table A-2/E.215 [T6.215]. p.

ANNEX B
(to Recommendation E.215)

Group call numbering scheme for the INMARSAT system

B.1 *Categories for group call services*

At present, four different categories of group call service have been envisaged within the maritime mobile-satellite service.

B.1.1 *National group calls*

The category is defined to address all ships of the same nationality.

B.1.2 *Fleet group calls*

This category is defined to address all ships within one fleet.

B.1.3 *Selected group calls*

This category is defined to address a number of ships having a community of interest irrespective of nationalities or fleets, and forming a predefined group.

B.1.4 *Area group calls*

This category is defined to address all ships of any nationality located within a predetermined geographical area.

B.2 *Group call formats*

B.2.1 The general group call format is $TX_1X_2X_3X_4X_5X_6X_7X_8$ where the digits $TX_1X_2X_3X_4X_5X_6X_7X_8$ take the values in § B.2.2 for INMARSAT Standard-A and the values in § B.2.3 for other INMARSAT standards.

B.2.2 The group call numbering schemes for the INMARSAT Standard-A system will use eight decimal digits $X_1 \mid\mid\mid X_8$ following the T digit, with T = 0, allocated as follows:

$M_2I_3D_4 0_5 0_6 0_7 0_8 0_9$ National group call

$M_2I_3D_4F_5F_6F_7F_8F_9$ Fleet group call

$0_2 0_3 S_4S_5S_6S_7S_8S_9$ Selected group call

$0_2 0_3 0_4 A_5A_6A_7A_8A_9$ Area group call

where $M_2 \neq 0$ $M_2 \neq 1$ $F_5 \neq 0$ $S_4 \neq 0$.

For T = 1 or 8, the group call number is not valid.

B.2.3 For INMARSAT standards other than Standard-A, the format of the digits $X_1 . \mid\mid X_8$ is as follows:

0MID $0_5 0_6 0_7 0_8$ National group calls

0MID $F_5F_6F_7F_8$ Fleet group calls

000 $S_4S_5S_6S_7S_8$ Selected group calls

0000 $A_5A_6A_7A_8$ Area group calls

The T digit takes the value allocated for the particular standard in accordance with Table 2/E.215.

Hence, for a fleet group call to a Standard B ship earth station, the format would be:

3 0 MID $F_5F_6F_7F_8$

and for a fleet group call to a Standard-C ship earth station, the format would be:

4 0 MID $F_5F_6F_7F_8$

B.2.4 The MIDs in national and fleet group numbers are those allocated in Table 1 of Appendix 43, Radio Regulations [1].

B.2.5 In accordance with § 4 of the above-mentioned Appendix, the particular MID reflects only the country allocating the group call identity and therefore does not prevent group calls to fleets containing more than one ship nationality. Allocation of selected group numbers should be avoided when the same group could equally well be assigned a fleet group number.

B.2.6 National group numbers and fleet group numbers should be allocated by countries. Selected group numbers and area group numbers as applicable to the INMARSAT system should be allocated by INMARSAT; allocation of such

numbers may require cooperation with other organizations.

B.2.7 A country having assigned a national group or fleet group number should notify the Director-General of INMARSAT if those numbers are going to be used within the INMARSAT system.

ANNEX C
(to Recommendation E.215)

Structure of the
on-board identification digits

in the INMARSAT numbering plan

C.1 *Introduction*

Within the numbering scheme, two digits Z_1Z_2 have been allocated (see §§ 4.3.1 and 4.4.1) to on-board identification. The purpose of these digits is to provide means for identifying different ship earth stations on the same ship, and different instruments, e.g. telephone instrument and a facsimile machine, connected to the same ship earth station.

Also, the present length of the *INMARSAT mobile international number* is limited to 12 digits. After 1996 it will be possible to increase the number length to 15 digits (see Recommendation E.165).

It is considered that the above aspects can be met by careful selection of the significance and values of Z_1Z_2.

C.2 *Proposed structure*

As outlined earlier, it is necessary for Z_1Z_2 to achieve two identification roles, i.e. station and instrument. It is considered that this can be accomplished by allocating Z_1 to multi-ship earth station identification and Z_2 to multi-instrument identification.

This structure would permit the uniform allocation of numbers to be achieved and would allow the growth of ship earth stations to be independent of the growth of instruments on any one ship earth station.

Further, in order to allow the future expansion of the numbering length, it is proposed that Z_1 should *never* be equal to 0 (zero) and the eighth digit of a 12-digit ship earth station number should always be equal to 0 (zero) as long as these two number lengths coexist for the same value of T digit.

i.e.: T MID XXXZ_1Z_2 (9 digits with $Z_1 \neq 0$)

T MID XXX0XXZ_1Z_2 (12 digits)

The above approach would then allow the unambiguous identification of 9-digit and 12-digit ship earth station numbers on the same T digit.

Note — The above constraint on the eighth digit is not required in the future when only 12 digit numbers exist in the INMARSAT system.

C.3 *Allocation*

Therefore, from the above, a ship with one ship earth station and one instrument Z_1Z_2 would equal 10. If another instrument were added, then Z_1Z_2 would equal 11 for this instrument.

If a ship had two earth stations of the same standard and one instrument attached to each, then the values of Z_1Z_2 would be 10 for one station, and 20 for the second station. If a second instrument were added to the second station, then the value of Z_1Z_2 would be 21 for this instrument.

Should it be necessary to allocate more than ten instruments per ship earth station, then another value of Z_1 would be allocated to the earth station, e.g. for the tenth instrument Z_1Z_2 would be equal to 19 and for the eleventh instrument 20 would be allocated or the next free value Z_1.

Table C-1/E.215 gives some illustrations of the above allocations.

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Table C-1/E.215 [T7.215], p.

Reference

[1] *Radio Regulations* , Appendix 43, ITU, Geneva, 1982, revised in 1985, 1986 and 1988.

Recommendation E.216

SELECTION PROCEDURES FOR THE INMARSAT MOBILE-SATELLITE TELEPHONE AND ISDN SERVICES

1 Introduction

1.1 *Purpose*

The purpose of this Recommendation is to standardize:

a) the selection procedures for subscribers in the public switched telephone network or ISDN calling a ship earth station in the INMARSAT systems;

b) the procedures for calling a subscriber, an operator or a special service termination in the public switched telephone network or ISDN from a ship earth station.

This Recommendation applies to INMARSAT Standard-A, B and C systems. Selection procedures for the INMARSAT Aeronautical system is for further study.

1.2 *Related CCITT Recommendations*

E.215 (Numbering plan for the mobile-satellite services of INMARSAT).

E.210 (Ship identification for VHF/UMF and maritime-mobile satellite services).

E.160 (Definitions relating to national and international numbering plans).

E.163 (Numbering plan for the international telephone service).

E.164 (Numbering plans for the ISDN era).

E.165 (Timetable for coordinated implementation of the full capability of the Numbering Plan for the ISDN era (Recommendation E.164)).

E.171 (International telephone routing plan).

E.172 (Call routing in the ISDN era).

Q.1101 (General principles for interworking between INMARSAT Standard-A system and the telephone network).

Q.1112 (Procedures for interworking between INMARSAT Standard-B system and the international public networks).

F.125 (Telex numbering plan for the mobile-satellite service of INMARSAT).

F.126 (Selection procedures for INMARSAT mobile-satellite telex service).

F.127 (Operational procedures for interworking between the telex service and the service offered by INMARSAT Standard-C).

2 Number structures

2.1 Maritime mobile-satellite services are international in nature and international procedures will be adopted to provide access to these services. For some purposes, a maritime mobile-satellite system can be regarded as analogous to a national network and the ship earth stations as subscribers within that network.

For automatic shore-originated calls, international selection procedures will be adopted using an international prefix number, the three digit country code 87S and a mobile earth station number where the digit S indicates the ocean region. The telephone/ISDN numbering plan for ship earth stations in the INMARSAT System is given in Recommendation E.215.

2.2 For automatic ship-originated calls international selection procedures will be used, including a stan dardized prefix, i.e. all ships in all ocean areas will use the same prefix to identify an automatic international call.

In addition, prefixes will be adopted to identify other functions for the satellite system. Annex A lists the allocation of the prefixes. Additional prefixes may be required and these can be added, using the spare decimal numeric combinations.

It is desirable to have one set of prefixes for all services. The prefixes listed in Annex A can be used where applicable for telex and data services and, if necessary, additional prefixes for these services may be assigned by the competent Study Group. Close cooperation between the competent Study Groups will be necessary when assigning new prefixes.

The use of some prefixes could be barred to some customers.

2.3 The prefixes will be sent over the radio path to the coast earth station but would not be used outside the satellite system. Hence, a prefix sent to the coast earth station would not be used in the international network.

2.4 The service associated with each prefix is defined in Annex B.

3 Procedures for shore-to-ship calls

3.1 *General selection sequence*

A shore based subscriber calling a ship in the INMARSAT system will select a numbering sequence as follows:

Pi International prefix

87S Country code

$TX_1X_2|||_n$ *INMARSAT mobile number* .

3.2 *Selection of S digit*

The numbering sequence requires the subscriber to know the satellite coverage area in which the ship is located. The values of the S digit are given in Recommendation E.215.

3.3 *INMARSAT mobile number*

The *INMARSAT mobile number* $TX_1X_2|||_n$ takes one of the formats defined in Recommendation E.215. The various possibilities are summarized in Table 1/E.216 and are further outlined below.

Table 1/E.216 [T1.216], p.

3.3.1 *INMARSAT Standard-A system*

For an ordinary call to an INMARSAT Standard-A ship earth station the formats of the *INMARSAT mobile number* is:

$$1\ X_1X_2X_3X_4X_5X_6$$

where the digits $X_1X_2X_3X_4X_5X_6$ identify a specific ship earth station. If there is more than one ship earth station at the ship, each will have its own unique *INMARSAT mobile number* .

Identification of different terminal equipment connected to a ship earth station is not possible in the INMARSAT Standard-A system. However, provisions can be made for calls to specific service terminations on the ship, e.g. a facsimile equipment. If signals for providing such information are available within the signalling systems used between the switching centre of call origin (i.e. the local national switching centre) and the coast earth station, they should be automatically inserted by that switching centre. In this case the numbering sequence would be as defined above, irrespective of the service termination on the ship. If some part of the connection does not have this capability, the required termination may be indicated by the following numbering sequence:

Pi International prefix

87S Country code

8Y Service termination

$1\ X_1X_2X_3X_4X_5X_6$ *INMARSAT mobile number* .

Values of the digit Y for the various service terminations are given in Table 3/E.215. Y = 1 is allocated to the facsimile service and Y = 2 is allocated to packet mode data transmission services using the protocol of Recommendation X.25. Of these, only Y = 1 will be available for selection by telephone subscribers.

As other service termination requirements are identified by INMARSAT, the CCITT will make additional allocations. It should be noted that the digits 8Y cannot be used for discrimination between several terminals of the same kind connected to a ship earth station. It should be further noted that the digits 8Y should not be selected for ordinary telephone calls.

3.3.2 *INMARSAT Standard-B system*

The *INMARSAT mobile number* | takes the following format for ship earth stations in the INMARSAT Standard-B system:

$$3\ 1I_2D_3X_4X_5X_6Z_1Z_2$$

The on board identification digits Z_1Z_2 are used for:

— identifying terminal equipment connected to a ship earth station;

— discrimination between several ship earth stations on the ship;

— discrimination between channels of multi-channel ship earth stations;

— combination of the above.

See also Annex C to Recommendation E.215.

3.3.3 *INMARSAT Standard-C system*

The *INMARSAT mobile number* | takes the following format:

$$4\ {}_1I_2D_3X_4X_5X_6Z_1Z_2$$

The digits Z_1Z_2 can be used for on board identification as follows:

— identifying terminal equipment connected to a ship earth station;

— discrimination between several ship earth stations on the ship;

— combination of the above.

3.3.4 *INMARSAT Aeronautical system*

The format of the *INMARSAT mobile number* , $5\ {}_1X_2X_3X_4X_5X_6X_7X_8$, is still to be determined.

4 Procedures for ship-to-shore calls

4.1 *General*

It should be possible to provide all information required for establishing a call from user terminals connected to the ship earth station. Such information may include:

a) called party address including any prefix,

b) desired coast earth station,

c) selection of a specific RPOA (for further study),

d) bearer service/teleservice characteristics, including supplementary service requests.

The information in a) is required for all calls. The information in b), c) and d) may be required on some calls, e.g. if the user requests a specific routing of the call or if specific service characteristics are to be applied.

4.2 *Calling a terrestrial subscriber*

4.2.1 A shipboard user will select the prefix 00 followed by the full international telephone or ISDN number required, whether or not the coast earth station is located in the called subscriber's country. Hence, the numbering sequence selected by a ship board subscriber will be of the form:

00 Prefix for automatic call

00 I_1 I_2 I_3 1, 2 or 3 digit country code

00I_1 I_2 I_3N_1 | | | $_n$ National (significant) number.

4.2.2 It is also possible to select specific services associated with the call by use of other prefixes than 00, e.g. 34 (person-to-person call), 35 (collect call), 36 (credit card call) and 37 (time and charges requested at end of call). The selection sequence will then be:

P_1P_2 Prefix

$P_1P_2I_1I_2I_3$ 1, 2, or 3 digit country code

$P_1P_2I_1I_2I_3N_1$ | | | $_n$ National (significant) number.

4.2.3 The ship earth station will permit the choice of a coast earth station identity through which the call is to be routed. Convenient land-line routings (e.g. use of the coast earth station nearest the destination country) could be encouraged by tariff considerations.

4.2.4 In INMARSAT systems the shipboard user may also select a specified RPOA for routing the call, when a choice between several RPOAs is available at the coast earth station. This selection is provided by information which may not be part of the selection sequence. (For further study.)

4.2.5 In INMARSAT Standard-B systems the user may chose among several service options. If some service characteristics are user selectable, it should be possible to make the selection from the user terminal. Standardization of selection procedures for supplementary services is for futher study.

4.3 *Calling an operator*

4.3.1 A shipboard user will select an operator prefix, the second digit identifying the type of operator required.

4.3.2 Table 2/E.216 illustrates the principle involved for two types of operator.

Some Administrations may wish to operate a system whereby shipboard users insert after the operator prefix a country code (I_1, I_2, $_3$). The insertion of the country code will allow the call to be routed to a relevant operator. If an Administration operating such a system receives an operator prefix without the optional digits, then the call must still be connected to an appropriate operator. Similarly, if an Administration not operating such a system receives an operator prefix followed by optional digits, then the optional digits should be ignored and the call connected to the operator denoted by the prefix alone.

Table 2/E.216 [T2.216], p.

4.3.3 Each Administration may decide which operators to provide, where they are to be located and how the call would be routed. If a request is received from a ship for a type of operator that the Administration does not provide, then the call will be routed to an operator convenient for that Administration.

4.4 *Other prefixes given in Annex A*

Each Administration may decide which services to provide and how the call would be routed. If a request is received from a ship for a service that the Administration does not provide, then the call will be routed to a location convenient for that Administration.

The general selection sequence could be as shown in Table 3/E.216.

The actual sequence may be decided by the Administration or INMARSAT.

Table 3/E.216 [T3.216], p.

5 Procedures for ship-to-ship calls

5.1 Selection procedures for ship-to-ship calls will be similar to those for ship-to-shore calls, using the maritime country code 87S. The numbering sequence selected by the shipboard user will be of the form:

00 Prefix for automatic call

00 87S Country code

0087S $TX_1X_2|||_n$ *INMARSAT mobile number* .

This format will be used whether or not the ships are in the same ocean area.

5.2 Each Administration operating a coast earth station may decide whether to switch ship-to-ship traffic within an ocean area at the coast earth station or at an international switching centre.

6 Instructions for telephone subscribers

The general principles laid down in Recommendation E.120 apply also to the maritime mobile-satellite service. The instructions should contain the full selection procedures with some emphasis put on the selection of the S digit in the country code.

7 Instructions for users at ship earth stations

It would be beneficial if coast earth station operators and/or INMARSAT provided user manuals defining the system capabilities and services offered. The manuals should contain information such as:

— general instructions for use of the INMARSAT services;

— location of coast earth stations;

— facilities provided and services supported by each coast earth station;

— selection procedures for setting up automatic calls;

— selection procedures for operator assisted calls for each coast earth station;

— selection procedures for setting up calls to the services listed in Annex A for each coast earth station;

— other instructions which INMARSAT may consider useful or important to users.

ANNEX A
(to Recommendation E.216)

Allocation of telephone prefixes, telex access codes and data transmission prefixes

A.1 Administrations should make application for the allocation of new prefixes and access codes to the CCITT Secretariat. The application should contain a definition for the service, termination or facility to be accessed.

The CCITT Secretariat would be responsible for coordinating the allocation of new prefixes and access codes with the competent Study Groups. The allocation of new prefixes and access codes should be done in such a way as to ensure that equivalent services carried by means of telephone, telex or data circuits are given the same prefix.

The prefixes and access codes to be used for automatic calling should be as follows:

Telephone — For international calls the prefix should be 00 followed by the international telephone number of the called subscriber. As an option for national calls the prefix 0 followed by the national (significant) number of the called subscriber could be used.

Note — In the maritime satellite service only the international format is preferred.

Telex — For international calls the access code should be 00 followed by the international telex number of the called subscriber. As an option for national calls the access code should be 0 followed by the national telex number of the called subscriber could be used.

Note — In the maritime satellite service only the international format is preferred.

Data transmission — For data calls through a public data network the format should always consist of the prefix 0 followed by the international data number of the called subscriber (see Recommendation X.350, § 5.2.1).

A.2 Table A-1/E.216 contains a list of prefixes and access codes allocated up to the present time for access to special destinations, services or facilities.

Table A-1/E.216 [1T4.216], p.

Table A-1/E.216 (suite)+ notes [2T4.216], p.

A.3 The facilities are defined in Annex B.

ANNEX B
(to Recommendation E.216)

Application of telephone prefixes, data transmission prefixes

and telex access codes — Definitions and descriptions

Services and facilities normally provided by the telephone data or telex networks are otherwise defined in CCITT Recommendations and do not require any further definitions. This annex provides definitions and descriptions of some of the special facilities of Annex A.

Note 1 — The same annex is contained in Recommendation F.126.

Note 2 — In this annex the term prefix is used to designate telephone prefix, telex access code and data transmission prefix.

B.1 *Operator*

B.1.1 **international outgoing operator (prefix 11)**

Prefix 11 will connect the caller to an international operator position. The prefix may be followed by a country code. If so, the procedure for servicing the call is described in § 4.3.

B.1.2 **international information service (prefix 12)**

Prefix 12 will connect the caller to the international information service. The prefix may be followed by a country code. If so, the procedure for servicing the call is described in § 4.3.

B.1.3 **national operator (prefix 13)**

Prefix 13 will connect the caller to a national or international operator position in the country where the coast earth station is located. The type of operator to be used is decided by the Administration.

Note — Prefix 13 may not be offered on all coast earth stations.

B.1.4 **national information service (prefix 14)**

Prefix 14 will connect the caller to a national or international operator position. The type of information service to be used is decided by the Administration.

Note — Prefix 14 may not be offered on all coast earth stations.

B.1.5 **radiotelegram service (prefix 15)**

Prefix 15 will connect the caller to the radio telegram service position. The transmission of radio telegram should normally be made by radio telex only. The radio telegram service in this case should be arranged in such a way that automatic retransmission is possible.

B.1.6 **booking of telephone calls (prefix 17)**

Prefix 17 will allow the caller to book a telephone call via the telex service.

This telex message will be routed to the relevant international (or national) telephone operator.

B.2 *Automatic facilities*

B.2.1 **access to maritime PAD (prefix 20)**

Prefix 20 is used for gaining access to a packet assembly/disassembly (PAD) facility in a packet switched public data network. The PAD is accessed via telephone circuits in the INMARSAT system. The prefix is followed by two additional digits indicating the required data rate (see Recommendation X.351).

B.2.2 **store-and-forward (international) (prefix 21)**

Prefix 21 is used for gaining access to a store-and-forward unit (SFU) for international calls.

B.2.3 **store-and-forward (national) (prefix 22)**

Prefix 22 is used for gaining access to a store-and-forward unit (SFU) for national calls.

B.2.4 **abbreviated dialling (short-code selection) (prefix 23)**

Abbreviated dialling (short-code selection) will allow the caller to make a connection by selecting a short special number (e.g. 2 or 3 digits) instead of a full international (or national) number.

B.2.5 **telex letter service (prefix 24)**

Prefix 24 is used for directly transmitting a message originated from a ship earth station (SES) to a selected telegraph office for delivery by mail or any appropriate means.

B.2.6 **access to PSPDN (prefix 25)**

Prefix 25 is used for obtaining access via INMARSAT telephone circuits to a maritime satellite data switching exchange (MSDSE) (see Recommendation X.350) for virtual call data services (Recommendation X.25). The prefix is followed by additional digits indicating data rate or other parameters associated with the call.

B.3 *Specialized assistance*

B.3.1 **maritime enquiries (prefix 31)**

Prefix 31 may be used for special enquiries such as ship location, authorization, all telegrams, etc.

B.3.2 **medical advice (prefix 32)**

Prefix 32 provides connection to national medical facilities (hospital, etc.) for obtaining medical advice or consultation. The prefix may be followed by a country code.

B.3.3 **technical assistance (prefix 33)**

For the maritime satellite service, prefix 33 provides connection to the technical personnel of the coast earth station in case difficulties are experienced in establishing communication.

For other maritime systems, further study is required.

B.3.4 **person-to-person call (prefix 34)**

Prefix 34 should be used when the call is for a specific person at the called number. An operator will intervene in the call, and should be provided with the details of the person to be called. The prefix may be followed by the number of the called party.

B.3.5 **collect calls (prefix 35)**

Prefix 35 should be used for calls, charges for which will be billed to the called party. The telephone operator will intervene in the call and should be provided with the information pertinent to the call. The prefix may be followed by the number of the called party.

B.3.6 **credit card calls (prefix 36)**

Arrangements can be made with the Administration of certain coast stations or coast earth stations for payments for communication services to be made by a credit card. The arrangement is valid only for the services of the station with which it is made.

An operator will intervene in the call and should be provided with details of the credit card. The prefix may be followed by the number of the called party.

B.3.7 **time and charges requested at end of call (prefix 37)**

Prefix 37 provides, upon completion of the call, either automatic printout of charging information, or connection to an operator who will supply charging information on the call. The prefix is followed by the number of the called party.

B.3.8 **medical assistance (prefix 38)**

If the condition of an ill or injured person aboard ship requires his urgent delivery ashore or the delivery of a doctor aboard ship, prefix 38 provides connection to the appropriate national authority responsible for this kind of activity.

B.3.9 **maritime assistance (prefix 39)**

Prefix 39 provides connection to the appropriate national authority in case maritime assistance is required (e.g. tow, oil pollution).

B.4 *Ship reporting*

B.4.1 **meteorological reports (prefix 41)**

Prefix 41 provides connection to the meteorological office for transmission of ship weather reports.

B.4.2 **navigational reports from ships (prefix 42)**

Prefix 42 provides connection to a navigational office for transmission of information from ship on any hazards which could endanger safety of navigation (e.g. wrecks, derelicts, floating obstructions, defective radiobeacons or light vessels, icebergs, floating mines, etc.).

B.4.3 **ship position reports (prefix 43)**

Prefix 43 provides connection to an appropriate national or international centre collecting ship movement information for search and rescue (or other) purposes.

B.5 *Information retrieval services (prefixes 5x)*

Further study is required.

B.6 *Specialized use*

Further study is required.

B.7 *(Reserved for future use.)*

B.8 *(Reserved for future use.)* .bp

B.9 *Test*

B.9.1 **automatic test line (prefix 91)**

Prefix 91 provides automatic test of the ship earth station in telex and telephony mode. In the maritime satellite service the coast earth station will automatically transmit a ‘‘QUICK BROWN FOX’’ test message for telex and provide a loop-around test line connection in accordance with Recommendation O.11 for telephony. Test lines for data transmission are for further study.

B.9.2 **commissioning tests (prefix 92)**

Prefix 92 is used in the maritime satellite service for conducting commissioning tests of ship earth stations.

B.9.3 **operational coordination (prefix 95)**

Prefix 95 is used in the maritime satellite service for operational communications between management and maintenance elements of the system.

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