

## RECOMMENDATION ITU-R M.492-6\*

**OPERATIONAL PROCEDURES FOR THE USE OF DIRECT-PRINTING  
TELEGRAPH EQUIPMENT IN THE MARITIME MOBILE SERVICE**

(Question ITU-R 5/8)

(1974-1978-1982-1986-1990-1992-1995)

**Summary**

The Recommendation provides in Annex 1 operational procedures for the use of direct-printing telegraph equipment in communication between a ship and a coast station in the selective ARQ-mode on a fully automated or semi-automated basis and to a number of ship stations or a single ship in the broadcast FEC-mode. It also specifies interworking between equipments in accordance with technical characteristics given in Recommendations ITU-R M.476 and ITU-R M.625. Appendix 1 contains procedures for setting up of calls.

The ITU Radiocommunication Assembly,

*considering*

- a) that narrow-band direct-printing telegraph services are in operation using equipment as described in Recommendations ITU-R M.476, ITU-R M.625 and ITU-R M.692;
- b) that an improved narrow-band direct-printing telegraph system providing automatic identification and capable of using the 9-digit ship station identity is described in Recommendation ITU-R M.625;
- c) that the operational procedures necessary for such services should be agreed upon;
- d) that, as far as possible, these procedures should be similar for all services and for all frequency bands (different operational procedures may be required in frequency bands other than the HF and MF bands);
- e) that a large number of equipments complying with Recommendation ITU-R M.476 exist;
- f) that interworking between equipments in accordance with Recommendations ITU-R M.476 and ITU-R M.625 is required, at least for a transitional period,

*recommends*

- 1** that the operational procedures given in Annex 1 be observed for the use of narrow-band direct-printing telegraph equipment in accordance with either Recommendation ITU-R M.476 or ITU-R M.625 in the MF and HF bands of the maritime mobile service;
- 2** that when using direct-printing telegraphy or similar systems in any of the frequency bands allocated to the maritime mobile service, the call may, by prior arrangement, be made on a working frequency available for such systems.

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\* This Recommendation should be brought to the attention of the International Maritime Organization (IMO) and the Telecommunication Standardization Sector (ITU-T).

## Operational procedures

### 1 Mode A (ARQ)

**1.1** Methods used for setting up narrow-band direct-printing telegraph communications between a ship station and a coast station in the ARQ-mode should be on a fully automatic or semi-automatic basis, insofar that a ship station should have direct access to a coast station on a coast station receiving frequency and a coast station should have direct access to a ship station on a coast station transmitting frequency.

**1.2** However, where necessary, prior contact by Morse telegraphy, radiotelephony or other means is not precluded.

**1.3** Through connection to a remote teleprinter station over a dedicated circuit or to a subscriber of the international telex network may be achieved by manual, semi-automatic or automatic means.

NOTE 1 – Before an international automatic service can be introduced, agreement has to be reached on a numbering plan, traffic routing and charging. This should be considered by both the ITU-T and the ITU-R.

NOTE 2 – Recommendations ITU-R M.476 (see § 3.1.5) and ITU-R M.625 (see § 3.8) make provision for automatic re-establishment of radio circuits by rephasing in the event of interruption. However, it has been reported that this procedure has, in some countries, resulted in technical and operational problems when radio circuits are extended into the public switched network or to certain types of automated switching or store-and-forward equipments. For this reason, some coast stations do not accept messages if the rephasing procedure is used.

NOTE 3 – When a connection is set up in the ARQ mode with the international telex network via a coast station, where practicable the general requirements specified in ITU-T Recommendation U.63 should be met.

**1.4** When, by prior arrangement, unattended operation is required for communication from a coast station to a ship station, or between two ship stations, the receiving ship station should have a receiver tuned to the other station's transmitting frequency and a transmitter tuned or a transmitter capable of being tuned automatically to the appropriate frequency and ready to transmit on this frequency.

**1.5** For unattended operation a ship station should be called selectively by the initiating coast or ship station as provided for by Recommendations ITU-R M.476 and ITU-R M.625. The ship station concerned could have available traffic stored ready for automatic transmission on demand of the calling station.

**1.6** At the "over" signal, initiated by the calling station, any available traffic in the ship's traffic store could be transmitted.

**1.7** At the end of the communication, an "end of communication" signal should be transmitted, whereupon the ship's equipment should automatically revert to the "stand-by" condition.

**1.8** A "free channel" signal may be transmitted by a coast station where necessary to indicate when a channel is open for traffic. The "free channel" signals should preferably be restricted to only one channel per HF band and their duration should be kept as short as possible. In accordance with Article 18 of the Radio Regulations and recognizing the heavy loading of the frequencies available for narrow-band direct printing in the HF bands, "free channel" signals should not be used in future planned systems.

**1.9** The format of the "free channel" signal should be composed of signals in the 7-unit error detecting code as listed in § 2 of Annex 1 to Recommendation ITU-R M.476 and § 2 of Annex 1 to Recommendation ITU-R M.625. Three of these signals should be grouped into a block, the middle signal being the "signal repetition" (RQ), the first signal of the block being any of the signals VXKMCF TBOZA and the third signal of the block being any of the signals VMPCYFS OIRZDA (see Recommendation ITU-R M.491). These signals should be indicated in the ITU List of Coast Stations.

Selections of new signals should preferably be chosen to correspond to the first two digits of that coast station's 4-digit identification number. If this is not possible because the characters needed are not listed above, or if this is not desired because this combination is already in use by another coast station, it is preferred that a combination of characters be selected from those listed above in the second part of each row, i.e. TBOZA for the first signal and OIRZDA for the third signal of the free channel block. The signals in the block are transmitted at a modulation rate of 100 Bd and the blocks are separated by pauses of 240 ms. For manual systems this "free channel" signal should be interrupted either by a period of no signal or by a signal or signals, that would enable an operator to recognize the "free channel" condition by ear. An aurally recognizable signal, e.g. a Morse signal, may be used alone as the "free channel" signal in manual systems. At least 8 blocks of the 7-unit signal should be transmitted before interruption.

**1.10** In the case of single frequency operation, as described in Recommendation ITU-R M.692, the free channel signal should be interrupted by listening periods of at least 3 s.

**1.11** General operational procedures for setting up calls between ship stations and between ship stations and coast stations are given below and specific procedures are given in Appendix 1.

## **1.12 Manual procedures**

### **1.12.1 Ship to coast station**

**1.12.1.1** The operator of the ship station establishes communication with the coast station by A1A Morse telegraphy, telephony or by other means using normal calling procedures. The operator then requests direct-printing communication, exchanges information regarding the frequencies to be used and, when applicable, gives the ship station the direct-printing selective call number assigned in accordance with Recommendation ITU-R M.476 or ITU-R M.625 as appropriate, or the ship station identity assigned in accordance with the Preface to List VII A.

**1.12.1.2** The operator of the coast station then establishes direct-printing communication on the frequency agreed, using the appropriate identification of the ship.

**1.12.1.3** Alternatively the operator of the ship station, using the direct-printing equipment, calls the coast station on a predetermined coast station receive frequency using the identification of the coast station assigned in accordance with Recommendation ITU-R M.476 or ITU-R M.625 as appropriate, or the coast station identity assigned in accordance with the Preface to List VII A.

**1.12.1.4** The operator of the coast station then establishes direct-printing communication on the corresponding coast station transmit frequency.

### **1.12.2 Coast station to ship**

**1.12.2.1** The operator of the coast station calls the ship station by A1A Morse telegraphy, telephony or other means, using normal calling procedures.

**1.12.2.2** The operator of the ship station then applies the procedures of § 1.12.1.1 or § 1.12.1.3.

### **1.12.3 Intership**

**1.12.3.1** The operator of the calling ship station establishes communication with the called ship station by A1A Morse telegraphy, telephony, or by other means, using normal calling procedures. The operator then requests direct-printing communication, exchanges information regarding the frequencies to be used and, when applicable, gives the direct-printing selective call number of the calling ship station assigned in accordance with Recommendation ITU-R M.476 or ITU-R M.625 as appropriate, or the ship station identity assigned in accordance with the Preface to List VII A.

**1.12.3.2** The operator of the called ship station then establishes direct-printing communication on the frequency agreed, using the appropriate identification of the calling ship.

## **1.13 Procedures for automatic operation**

### **1.13.1 Ship to coast station**

**1.13.1.1** The ship station calls the coast station on a predetermined coast station receive frequency, using the direct-printing equipment and the identification signal of the coast station assigned in accordance with Recommendation ITU-R M.476 or ITU-R M.625 as appropriate, or the coast station identity assigned in accordance with the Preface to List VII A.

**1.13.1.2** The coast station's direct-printing equipment detects the call and the coast station responds directly on the corresponding coast station transmit frequency, either automatically or under manual control.

### **1.13.2 Coast station to ship**

**1.13.2.1** The coast station calls the ship station on a predetermined coast station transmit frequency, using the direct-printing equipment and the ship station direct-printing selective call number assigned in accordance with Recommendation ITU-R M.476 or ITU-R M.625 as appropriate, or the ship station identity assigned in accordance with the Preface to List VII A.

**1.13.2.2** The ship station's direct-printing equipment tuned to receive the predetermined coast station transmit frequency detects the call, whereupon the reply is given in one of the following ways:

- a) the ship station replies either immediately on the corresponding coast station receive frequency or at a later stage, using the procedure of § 1.12.1.3; or
- b) the ship station's transmitter is automatically started on the corresponding coast station receive frequency and the direct-printing equipment responds by sending appropriate signals to indicate readiness to receive traffic automatically.

## **1.14 Message format**

**1.14.1** Where the appropriate facilities are provided by the coast station, traffic may be exchanged with the telex network:

- a) in a conversational mode where the stations concerned are connected directly, either automatically or under manual control; or
- b) in a store-and-forward mode where traffic is stored at the coast station until the circuit to the called station can be set up, either automatically or under manual control.

**1.14.2** In the shore-to-ship direction, the message format should conform to normal telex network practice (see also Appendix 1, § 2).

**1.14.3** In the ship-to-shore direction, the message format should conform to the operational procedures specified in Appendix 1, § 1.

## **2 Mode B (FEC)**

**2.1** Messages may, by prior arrangement, be sent in the B mode from a coast station or a ship station to a number of ships or to a single ship, preceded if desired by the selective call code of the ship(s) concerned where:

- 2.1.1** a receiving ship station is not permitted or not able to use its transmitter, or
- 2.1.2** communications are intended for more than one ship, or
- 2.1.3** unattended reception of the B mode is required and automatic acknowledgement is not necessary.

In such cases, the ship station receivers should be tuned to the appropriate coast or ship station transmitting frequency.

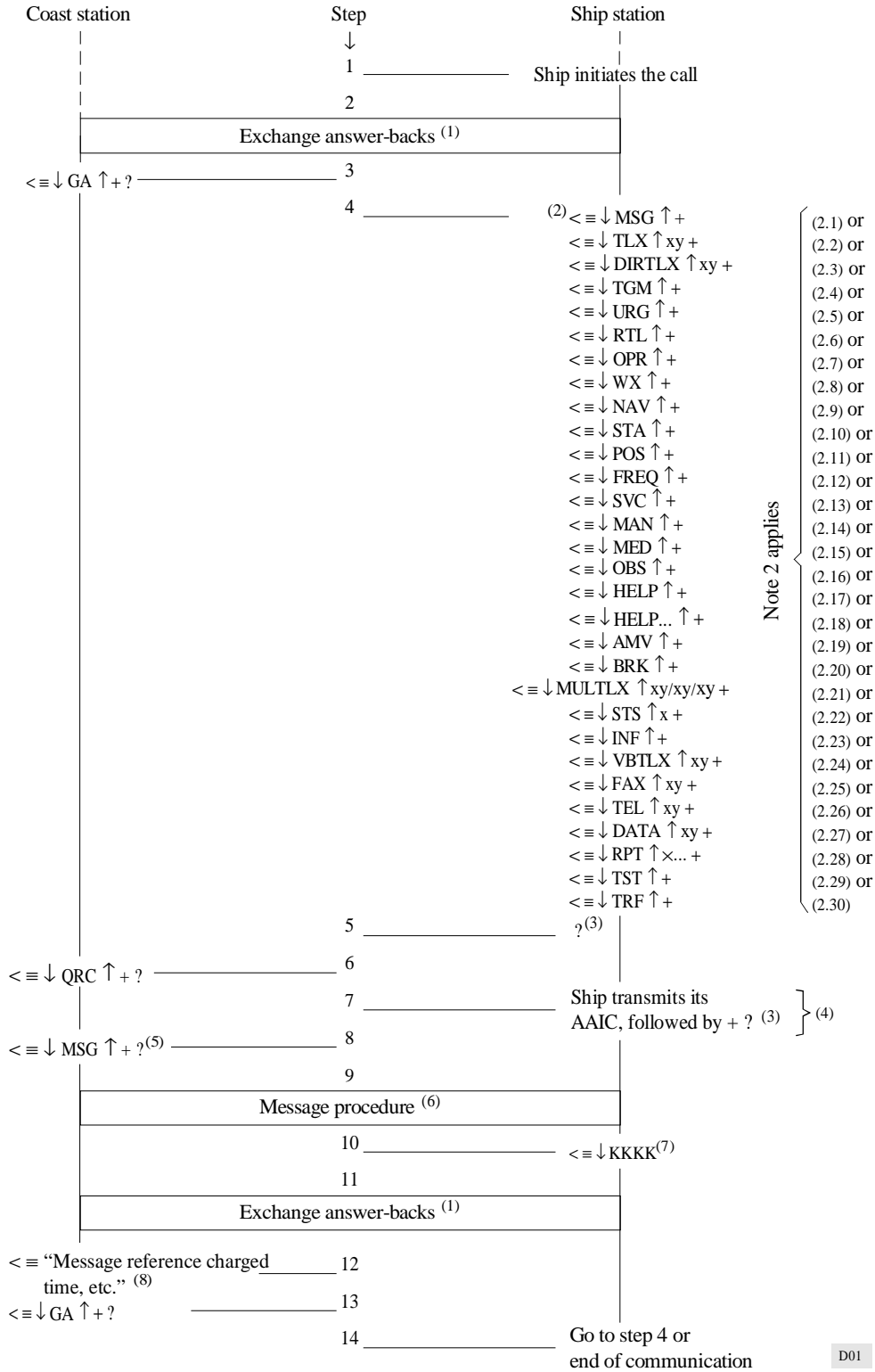
- 2.2** All B mode messages should start with “carriage return” and “line feed” signals.
- 2.3** When the ship station receives phasing signals in the B mode, its teleprinter should start automatically and should stop automatically when reception of the emission ceases.
- 2.4** Ship stations may acknowledge the reception of B mode messages by A1A Morse telegraphy, telephony or by other means.

### **3 Inter-working between equipments in accordance with Recommendations ITU-R M.476 and ITU-R M.625**

- 3.1** Recommendation ITU-R M.625 provides for automatic inter-working with equipment which is in accordance with Recommendation ITU-R M.476. The criteria for determining whether one or both stations are of the Recommendation ITU-R M.476 type are the length of the call signal and the composition of the call blocks.
- 3.2** If both stations have equipment in accordance with Recommendation ITU-R M.625, automatic station identification is a part of the automatic call set-up procedures. However, if one or both stations have equipment in accordance with Recommendation ITU-R M.476, no automatic station identification takes place. For this reason, and because Recommendation ITU-R M.625 accommodates the use of the 9-digit ship station identity for the direct-printing equipment call signal, it is desirable that all new equipment be in accordance with Recommendation ITU-R M.625 at the earliest practicable time.
- 3.3** In order to attain full compatibility with the large number of existing equipment, it will be necessary to assign both a 9-digit and a 5- (or 4-) digit identity (i.e. 7- and 4-signal call signals) to such new stations. Ship and coast station lists should contain both signals.

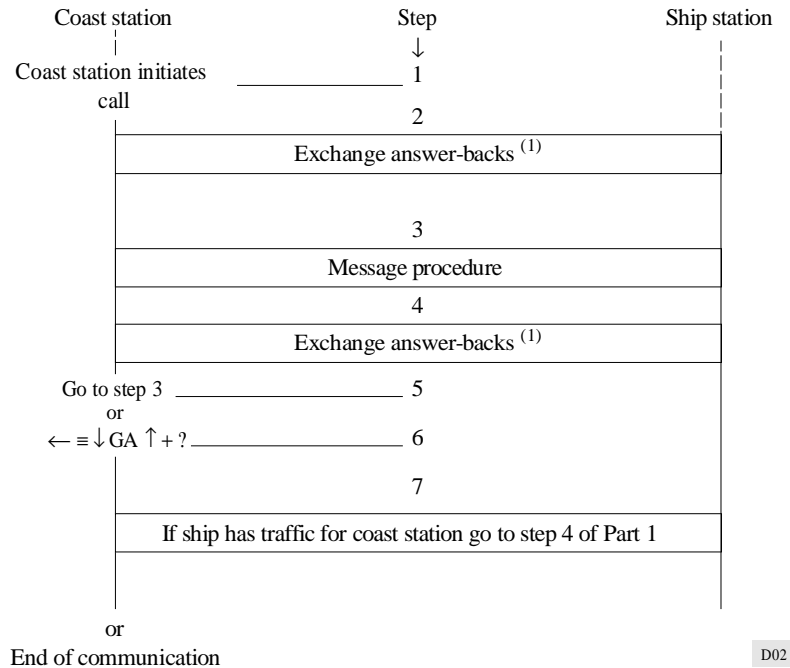
APPENDIX 1

1 Procedure for setting up a call in the ship-to-coast station direction



## 2 Procedure for setting up a call in the coast-to-ship station direction

Operation in the direction coast station to ship may need to be in the store-and-forward mode owing to the fact that radio propagation conditions may not allow the setting up of a call at the intended time.



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Notes relative to § 1 and 2:

- (1) a) In automatic operation the answer-back exchange is initiated and controlled by the coast station. For calls set up by the ship station the answer-back exchange in manual operation may be initiated by the ship station.  
  
For calls set up by the coast station the answer-back exchange in manual operation is initiated by the coast station, thereby defining the order in which the exchange takes place.
- b) Answer-back code as defined in ITU-T Recommendations F.130 for ship stations and F.60 for coast stations.
- (2) A coast station need not provide all of the facilities indicated. However, where specific facilities are provided, the facility codes indicated should be used. The facility "HELP" should always be available.
- (2.1) MSG indicates that the ship station needs to immediately receive any messages held for it at the coast station.
- (2.2) TLX ↑ xy indicates that the following message is for immediate connection to a store-and-forward facility located at the coast station.  
  
y indicates the subscriber's national telex number.  
  
x is used where applicable to indicate the country code (ITU-T Recommendation F.69) preceded by 0 (when applicable). (Where the store-and-forward system is remote from the coast station, TLX alone may be used.)  
  
TLXA may optionally be used instead of TLX which indicates that ship wishes to be advised (using the normal shore-to-ship procedures) when the message has been delivered to the indicated telex number.
- (2.3) DIRTLX ↑ xy indicates that a direct telex connection is required.  
  
y indicates the subscriber's national telex number.  
  
x is used where applicable to indicate the country code (ITU-T Recommendation F.69) preceded by 0 (when applicable).  
  
RDL + may optionally be used to indicate that the last DIRTLX ↑ xy telex number should be redialled.
- (2.4) TGM indicates that the following message is a radio telegram.

- (2.5) URG indicates that the ship station needs to be connected immediately to a manual assistance operator and an audible alarm may be activated. This code should only be used in case of emergency.
- (2.6) RTL indicates that the following message is a radio telex letter.
- (2.7) OPR indicates that connection to a manual assistance operator is required.
- (2.8) WX indicates that the ship station needs to immediately receive weather information.
- (2.9) NAV indicates that the ship station needs to immediately receive navigational warnings.
- (2.10) STA indicates that the ship station needs to immediately receive a status report of all store-and-forward messages which have been sent by that ship station, but which the ship station has not already received on retransmitted or non-delivered information (see also (6)). STA ↑ x may also be used where the ship station needs to immediately receive a status report of such a message where x indicates the message reference provided by the coast station.
- (2.11) POS indicates that the following message contains the ship's position. Some administrations use this information to assist in the subsequent automatic transmission or reception of messages (e.g. for calculating the optimum traffic frequency and/or the appropriate directional antennas to use).
- (2.12) FREQ indicates that the following message indicates the frequency on which the ship is keeping watch.
- (2.13) SVC indicates that the following message is a service message (for subsequent manual attention).
- (2.14) MAN indicates that the following message is to be stored and manually forwarded to a country which cannot be accessed automatically.
- (2.15) MED indicates that an urgent medical message follows.
- (2.16) OBS indicates that the following message is to be sent to the meteorological organization.
- (2.17) HELP indicates that the ship station needs to immediately receive a list of available facilities within the system.
- (2.18) If information is needed on the application of procedures for individual facilities at a coast station, request for further details concerning the specific procedure can be obtained by the facility code HELP followed by the appropriate facility code for which the information is needed, e.g.: < ≡ ↓HELP DIRTLX ↑+ indicates that the ship station needs information on the procedures (action by ship operator) for ordering a dialogue-mode connection with a telex network subscriber via the coast station.
- (2.19) AMV indicates that the following message is to be sent to the AMVER organization.
- (2.20) BRK indicates that the use of the radio path is to be immediately discontinued (for use where the ship's operator can only use a teleprinter for controlling the ARQ equipment).
- (2.21) MULTLX ↑ xy/xy/xy + indicates that the following message is a multiple address message for immediate connection to a store-and-forward facility located at the coast station.
- y indicates the subscriber's national telex number.
- x is used where applicable to indicate the country code (ITU-T Recommendation F.69) preceded by 0 (when applicable).
- Each separate xy indicates a different telex number to which the same message should be forwarded. At least two separate telex numbers should be included.
- MULTLXA may optionally be used instead of MULTLX which indicates that the ship wishes to be advised (using the normal shore-to-ship procedures) when the messages have been delivered to the indicated telex numbers.
- (2.22) STS ↑ x + indicates that the following message is for transmission to a ship using a store-and-forward facility located at the coast station. x indicates the addressed ship's 5- or 9-digit identity number.
- (2.23) INF indicates that the ship station needs to immediately receive information from the coast station's database. Some administrations provide a variety of different database information in which case INF returns a directory listing and a subsequent facility code is used to select the desired information.
- (2.24) VBTLX ↑ xy indicates that the following message should be dictated, by the coast station, to a voicebank (voice messaging) telephone number for subsequent retrieval by the addressee, and that a copy of the message should be forwarded to telex number xy. The voicebank telephone number should be included in the first line of the message text.
- (2.25) FAX ↑ xy indicates that the following message should be forwarded, via the PSTN, by facsimile to the telephone number xy.
- (2.26) TEL ↑ xy indicates that the following message should be telephoned, by the coast station, to the telephone number xy.
- (2.27) DATA ↑ xy indicates that the following message should be forwarded by the coast station using data facilities to the subscriber number xy (via the PSTN).
- (2.28) RPT ↑ xy... indicates that the ship needs to receive, using the ARQ mode, a specific identified message (e.g., earlier transmitted in the FEC mode), if still available for automatic retransmission. x... is used as the message identifier.
- (2.29) TST indicates that the ship needs to receive an automatically transmitted test text (e.g. "the quick brown fox ...").
- (2.30) TRF indicates that the ship needs to receive information, automatically transmitted, on tariffs currently applicable to the coast station.



- (3) The symbol “?” is not necessary where the coast station is automatic. It is normally required only for manual systems.
- (4) In cases where the coast station requires information about the relevant Accounting Authority Identification Code (AAIC), this information should be provided by the ship operator on receipt of the combination  $\langle \equiv \downarrow \text{QRC} \uparrow +$  from the coast station.  
Some coast stations may request additional information, e.g. ship’s name, call sign, etc.
- (5) This sequence may be preceded where necessary by suitable prompts or facility selection information and, if appropriate, any consequent ship station reply, or may be deleted where not applicable (e.g. where facility codes WX, NAV, STA, MSG or HELP are input at step 4). Where facility code DIRT LX  $\uparrow xy$  was input at step 4, this sequence may be replaced by the distant end answer-back or by any service signal (e.g. NC, OCC, etc.) received from the telex network.
- (6) Message procedures depend on which facility is used:  
For TLX where the store-and-forward system is remote from the coast station, ITU-T Recommendation F.72 may apply. Where the store-and-forward system is located at the coast station, the complete information content of the message sent at this step will be forwarded to the subscriber whose telex number is given by xy.  
For DIRT LX, see ITU-T Recommendation F.60.  
For TGM, see ITU-T Recommendations F.1 and F.31.  
For SVC and MED, the message will normally be plain text and no specific message procedure is required.  
For RTL, the message will be plain text but should include the postal address of the addressee.  
For STA, the appropriate status information is returned to the ship in accordance with ITU-T Recommendation F.72, § 11.3 and 11.4.  
For POS and FREQ, specific national procedures may apply.
- (7) This sequence of 4 K’s “KKKK” (4 combination No. 11 signals in the letter case) indicates that any network connection should be cleared but that the radio path should be maintained and that the procedure should immediately proceed to step 11. This sequence may be used elsewhere in the procedure in which case the procedure reverts to step 3.
- (8) This step is optional and may not apply to all facilities.
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