



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**Q.1103**

**INTERWORKING WITH SATELLITE  
MOBILE SYSTEMS**

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**INTERWORKING BETWEEN  
SIGNALLING SYSTEM No. 5 AND  
INMARSAT STANDARD A SYSTEM**

**ITU-T Recommendation Q.1103**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation Q.1103 was published in Fascicle VI.14 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

## Recommendation Q.1103

### INTERWORKING BETWEEN SIGNALLING SYSTEM No. 5 AND INMARSAT STANDARD A SYSTEM

#### 1 Introduction

It is necessary to specify the interworking of Signalling System No. 5 and the signalling system used in the INMARSAT Standard A system. This is because:

- a) it may be desirable that a Maritime Satellite Switching Centre (MSSC)<sup>1)</sup> be connected to an international switching centre (ISC) by employing System No. 5 on circuits between the MSSC and the ISC;
- b) the signalling systems used in the Maritime Mobile-Satellite Service will be different from System No. 5. Therefore it would be necessary to establish rules by which signalling events in one system may be related to corresponding events in the other system.

It is desirable that the interworking be such that the full capability of both System No. 5 and the maritime satellite signalling system can be utilized.

This Recommendation considers only automatic interworking between the MSSC and an ISC utilizing System No. 5.

For description of the INMARSAT Standard A signalling system, see Annex A to Recommendation Q.1101.

#### 2 Calls from Signalling System No. 5 to the maritime system (see figure 1 /Q.1103)

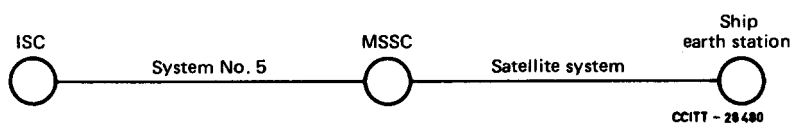


FIGURE 1/Q.1103

2.1 The ISC sends the seizing signal followed by either of the following sequences of address signals:

2.1.1 Signal KP1 followed by the discriminating (or language) digit and the number of the wanted ship earth station when the country code 87S is not required for routing in the MSSC.

2.1.2 Signal KP2 followed by 87S, discriminating (or language) digit and the number of the wanted ship earth station when the country code is required for routing in the MSSC.

2.2 The MSSC register should ignore further digits when either:

- a) the ST signal has been received by the MSSC, or
- b) the busy-flash signal has been sent by the MSSC.

2.3 The answer signal should be sent in the backward direction as soon as the answer signal over the satellite link has been detected.

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<sup>1)</sup> For definition, see Recommendation Q.1101.

- 2.4 The busy-flash signal should be sent if the call cannot be completed for any of the following reasons:
- congestion at the MSSC or in the maritime satellite system;
  - the satellite channel has not been assigned within 20 seconds of the receipt of the ST signal;
  - the NCS/MSSC is out of service.
- 2.5 If the called ship earth station is busy, then the MSSC may either return the busy tone or the busy-flash signal.
- 2.6 The special information tone should be sent if the call cannot be completed for any of the following reasons:
- the ship earth station does not respond to the call;
  - the called ship earth station is excluded from participating in the service;
  - the received number does not belong to any ship earth station;
  - the received number is an unauthorized group call;
  - the called ship earth station is faulty;
  - continuity of the satellite link is not established.
- 2.7 When a clear-back signal is detected on the satellite link, this signal shall result in sending of the clear-back signal on the terrestrial connection. The satellite link should be released so that the provisions of Recommendation Q.118 do not apply for this part of the connection.
- 2.8 When the MSSC detects the clear-forward from the terrestrial network, the terrestrial and satellite links will clear down according to their respective specification. If, however, switching at the MSSC is achieved by direct frequency selection, then it will be necessary to delay the release guard on the terrestrial link until the satellite link is idle.
- 2.9 For the SDL description of incoming System No. 5, see Recommendation Q.612 [1].
- 2.10 The SDL description of interworking between incoming System No. 5 and outgoing INMARSAT signalling system is given in annex A.
- 2.11 For the SDL description of outgoing INMARSAT signalling system, see Annex C to Recommendation Q.1101.

### 3 Calls from the maritime satellite system to Signalling System No. 5 (see figure 2/Q.1103)

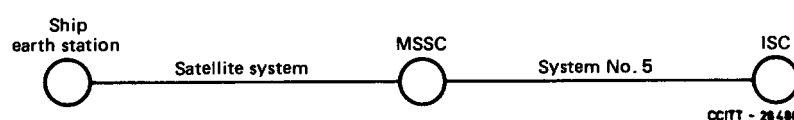


FIGURE 2/Q.1103

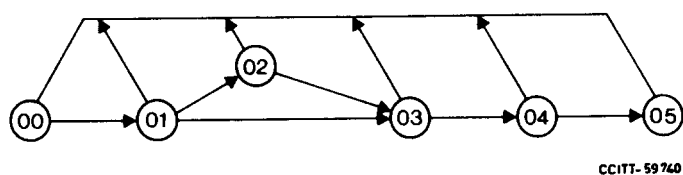
- 3.1 The terrestrial circuit should not be seized before a satellite channel has been allocated, the continuity of the channel has been verified, and all digits have been received.
- 3.2 The KP signal should be used subject to the following conditions:
- KP1 if the call is terminated in the MSSC country (in this case the country code is suppressed) or in another country having direct connection to the MSSC;
  - KP2 if the call is transit connected to another country.
- 3.3 The discriminating digit should be inserted according to [2].
- 3.4 The ST signal should be sent according to [3].
- 3.5 The congestion tone should be sent to the ship earth station when the busy-flash signal is received.

- 3.6 Time-out supervision of the answer signal at the MSSC should comply with the provisions of Recommendation Q.118, § 4.3.1.
- 3.7 If the MSSC receives a clear-back signal from the terrestrial network, the time-out of Recommendation Q.118, § 4.3.2 shall be started. The satellite and terrestrial links will be cleared either by the ship earth station or by expiry of the 1-2 minutes time-out.
- 3.8 When the MSSC detects a release condition on the satellite link, the terrestrial connection should be cleared forward as soon as possible.
- 3.9 For the SDL description of outgoing System No. 5, see Recommendation Q.622 [4].
- 3.10 The SDL description of interworking between incoming INMARSAT Standard A signalling system and outgoing System No. 5 is given in Annex B.
- 3.11 For the SDL description of incoming INMARSAT signalling system, see Annex B to Recommendation Q.1101.

## ANNEX A

(to Recommendation Q.1103)

### Logic procedures for interworking of Signalling System No. 5 to the INMARSAT Standard A signalling system



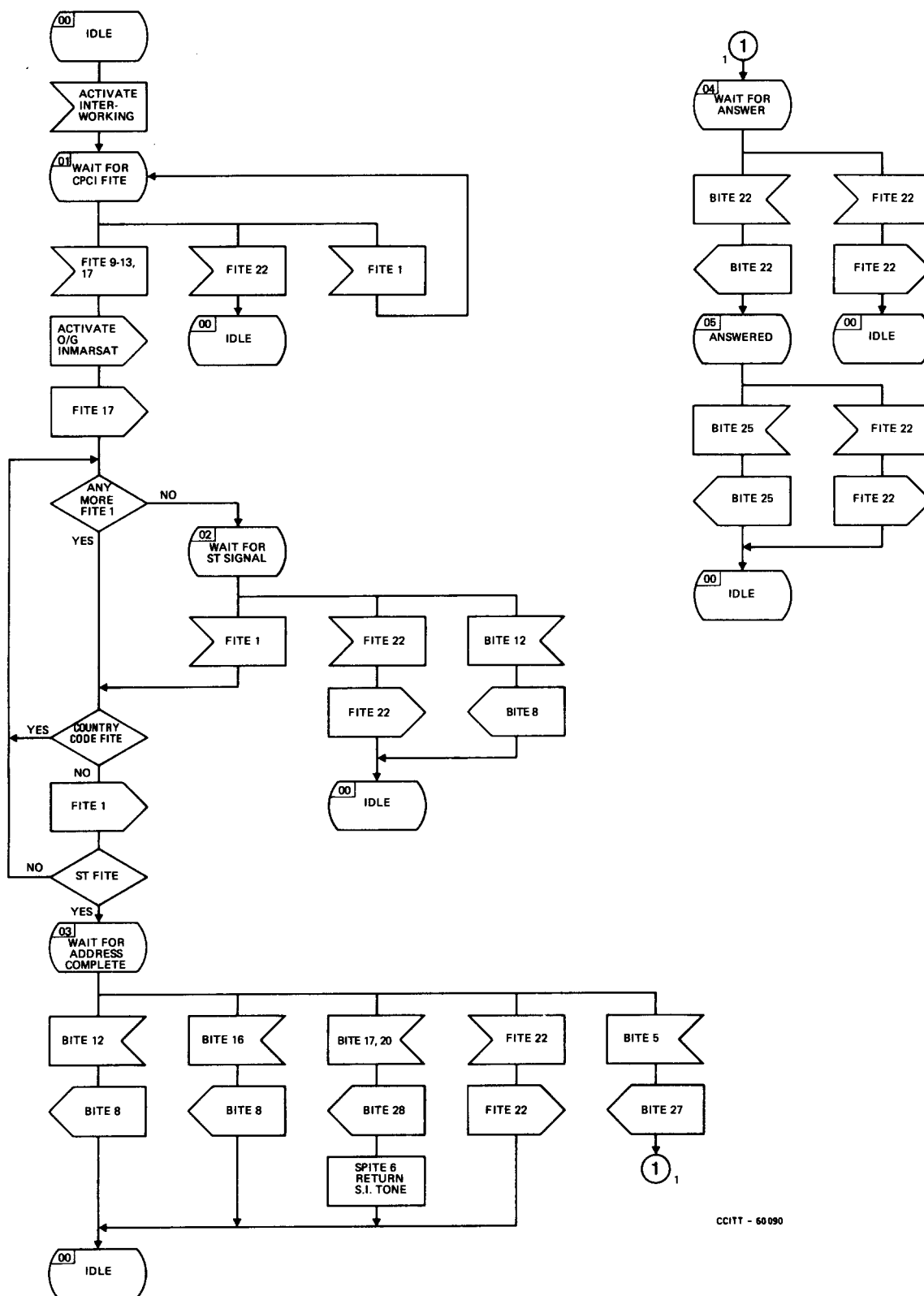
State number	State description	Sheet reference
00	Idle	1
01	Wait for CPCI Fite	1
02	Wait for ST signal	1
03	Wait for address complete	1
04	Wait for answer	1
05	Answered	1

FIGURE A-1/Q.1103

### State overview diagram for interworking of Signalling System No. 5 to the INMARSAT Standard A signalling system

FIGURE A-2/Q.1103

(Reserved for future notes)



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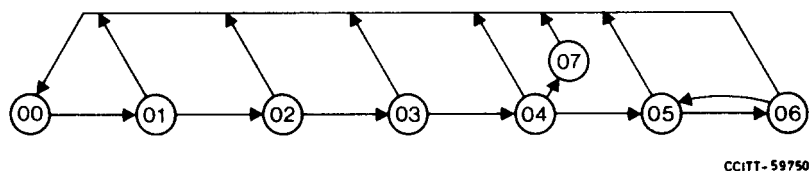
FIGURE A-3/Q.1103

Interworking of Signalling System No. 5 to  
the INMARSAT Standard A signalling system

# ANNEX B

(to Recommendation Q.1103)

## Logic procedures for interworking of the INMARSAT Standard A signalling system to the Signalling System No. 5



State number	State description	Sheet reference	Timers running
00	Idle	1, 2	
01	Wait for CPCI Fite	1	
02	Wait for address complete	2	
03	Wait for register deactivation	2	
04	Wait for answer	2	$t_1$
05	Answered	2	
06	Clear-back	2	$t_2$
07	Wait for clear forward	2	$t_3$

FIGURE B-1/Q.1103

### State overview diagram for interworking of the INMARSAT Standard A signalling system to Signalling System No. 5

*Supervisory timers for interworking of the INMARSAT Standard A signalling system to Signalling System No. 5*

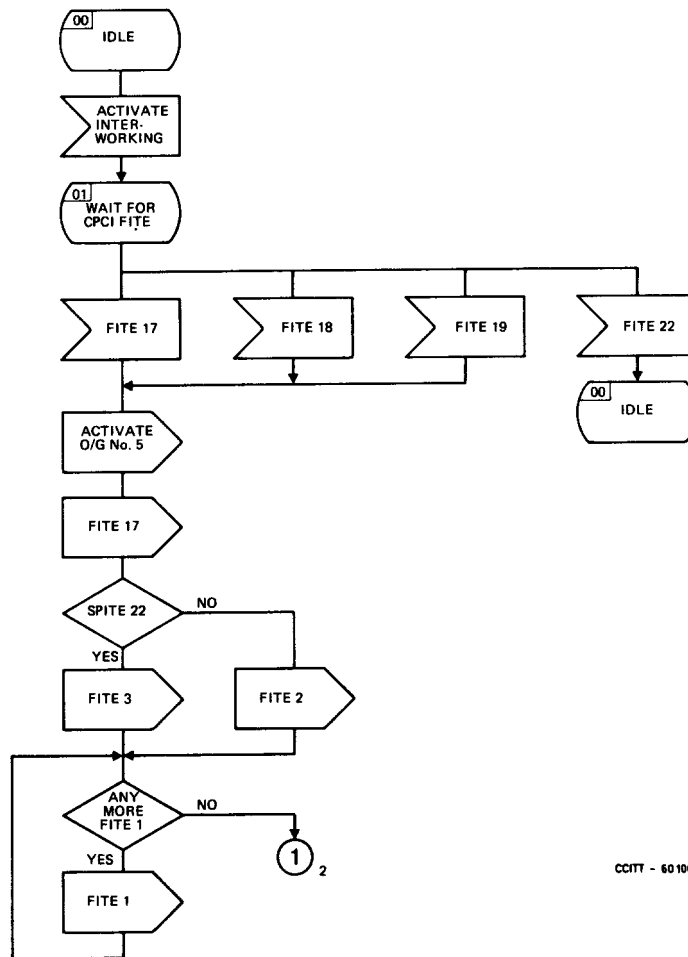
$t_1$  = 2-4 minutes Recommendation Q.118, § 4.3.1

$t_2$  = 1-2 minutes Recommendation Q.118, § 4.3.2

$t_3$  = 20 seconds

Figure B-2/Q.1103

### Notes to interworking of the INMARSAT Standard A signalling system to Signalling System No. 5



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FIGURE B-3/Q.1103 (sheet 1 of 2)

**Interworking of the INMARSAT Standard A signalling system to  
Signalling system No. 5**





## References

- [1] CCITT Recommendation *Logic procedures for incoming Signalling System No. 5*, Vol. VI, Rec. Q.612.
- [2] CCITT Recommendation *Analysis of digital information for routing*, Vol. VI, Rec. Q.155, § 3.4.5.
- [3] CCITT Recommendation *End-of-pulsing conditions - Register arrangements concerning ST (end-of-pulsing) signal*, Vol. VI, Rec. Q.152, § 3.2.1, b), (2).
- [4] CCITT Recommendation *Logic procedure for outgoing Signalling System No. 5*, Vol. VI, Rec. Q.622.