INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.258

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 6

SIGNAL UNIT FORMATS AND CODES

TELEPHONE SIGNALS

ITU-T Recommendation Q.258

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.258 was published in Fascicle VI.3 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.

3.2 TELEPHONE SIGNALS

3.2.1 *Initial address message (IAM)*

The initial address message (IAM) is the first message of a call. It is a special case of the multi-unit message as it consists of a minimum of three signal units and a maximum of six signal units. It can contain different types of information - address signals (including ST), other routing information, and the filler code - under the same heading code.

3.2.1.1 *Format of the initial address message*

The format of the initial signal unit is shown in Figure 5/Q.257.

The format of the subsequent signal units is shown in Figure 6/Q.257 except for the subsequent signal units numbers 2-5 in which the signal information field (bits 5-20) is sub-divided into four 4-bit parts so that four address signals can be carried in each of these subsequent signal units.

The subsequent signal units of an initial address message do not require the 5-bit heading or 1l-bit label as this information is already contained in the initial signal unit.

The number of address signals available for transmission determines the length of the initial address message.

3.2.1.2 *Codes used in the initial address message*

a) *Initial signal unit*

- The 5-bit heading code **1 0 0 0 0** is used.
- The signal information code **0 0 0 0** is used.
- The assigned label code is used.

b) *Subsequent signal unit (number 1)*

- The heading code **0 0** is used.
- The length indicator is coded as appropriate (see Recommendation Q.257, 3.1.3.4).
- Bit 5: country code indicator:
  - **0** country code not included
  - **1** country code included
- Bit 6: nature of circuit indicator:
  - **0** no satellite circuit in the connection
  - **1** one satellite circuit in the connection
- Bit 7: echo-suppressor indicator:
  - **0** outgoing half-echo suppressor not included
  - **1** outgoing half-echo suppressor included
- Bit 8: spare (reserved for international use) [1)]
- Bits 9-12: spare (reserved for regional and/or national use) [1)]
- Bits 13-16: calling-party's-category indicator

  0 0 0 0 spare
  0 0 0 1 operator, language French
  0 0 1 0 operator, language English
  0 0 1 1 operator, language German
  0 1 0 0 operator, language Russian
  0 1 0 1 operator, language Spanish

0 1 1 0⎫ available to Administration
0 1 1 1⎬ for selecting a particular language provided by mutual agreement
1 0 0 0⎭
1 0 0 1 reserved (see Recommendation Q.104)
1 0 1 0 ordinary calling subscriber
1 0 1 1 calling subscriber with priority
1 1 0 0 data call
1 1 0 1 test call
1 1 1 0 spare
1 1 1 1 spare (reserved for regional and/or national use)

- Bits 17-20: spare (reserved for regional and/or national use) [1)]

c) *Subsequent signal units (numbers 2-5) - telephone call*

- The heading code **0 0** is used.
- The length indicator is coded as appropriate (see Recommendation Q.257, § 3.1.3.4).
- The four 4-bit parts of the signal information field contain address signals in sequence, bits 5-8, bits 9-12, etc., and are coded as follows:

0 0 0 0	filler	(no information)
0 0 0 1	digit	1
0 0 1 0	digit	2
0 0 1 1	digit	3
0 1 0 0	digit	4
0 1 0 1	digit	5
0 1 1 0	digit	6
0 1 1 1	digit	7
1 0 0 0	digit	8
1 0 0 1	digit	9
1 0 1 0	digit	0
1 0 1 1	code	11
1 1 0 0	code	12
1 1 0 1	spare	
1 1 1 0	spare	
1 1 1 1	ST	

The filler code **0 0 0 0** is used where needed to complete the signal information field of the last subsequent signal unit of the initial address message.

d) *Subsequent signal unit (number 2) - test call*

- The heading code **0 0** is used.
- The length indicator is coded as appropriate (see Recommendation Q.257, § 3.1.3.4).
- The first 4-bit part (bits 5-8) of the signal information field contains an address signal coded as follows:

0 0 0 0 system No. 6 continuity check
0 0 0 1 ATME 2 - signalling check and transmission test
0 0 1 0 ATME 2 - signalling check only
0 0 1 1 quiet termination test line
0 1 0 0 echo suppressor test system
0 1 0 1 loop around test line
0 1 1 0 transmission access test line
0 1 1 1 transmission access test line
1 0 0 0 transmission access test line
1 0 0 1 echo canceller test line
1 0 1 0 spare
1 0 1 1 spare
1 1 0 0 spare

---

1) These bits are coded as **0** at present.

1 1 0 1 spare
1 1 1 0 spare
1 1 1 1 spare

The codes used to complete the signal information field of the subsequent signal unit (number 2) test call are the end-of-pulsing (ST) and fillers.

3.2.1.3 *Example of an initial address message*

An example of a three-unit initial address message is shown in Figure 7/Q.258.

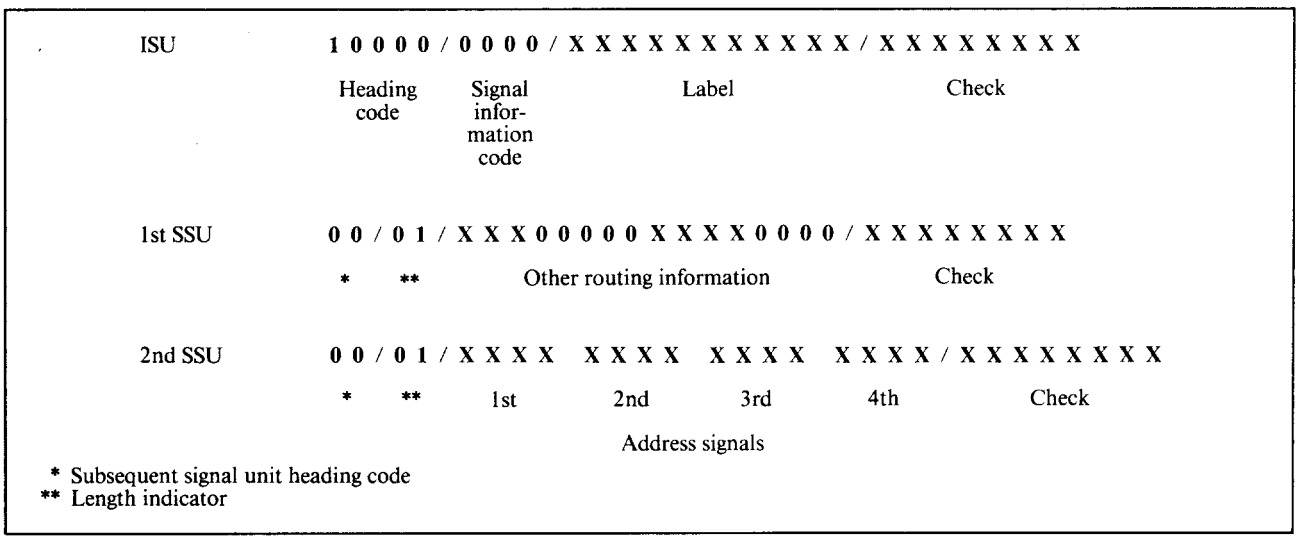

FIGURE 7/Q.258

Example of a three-unit initial address message

3.2.2 *Subsequent address message (SAM)*

A subsequent address message (SAM) is used to transmit additional address signals not available when the initial address message is formed.

A subsequent address message may be either a one-unit message or a multi-unit message.

3.2.2.1 *Formats of subsequent address messages*

a) *Lone signal unit*

The format of the lone signal unit is shown in Figure 5/Q.257.

b) *Multi-unit message*

The format of the initial signal unit is shown in Figure 5/Q.257.

The format of the subsequent signal units is shown in Figure 6/Q.257. In this case, however, the signal information fields of every subsequent signal unit are sub-divided into four 4-bit parts.

3.2.2.2 *Codes used in subsequent address messages*

a) *Heading*

Heading codes in the range **1 0 0 0 1-1 0 1 1 1** are used in the lone signal unit or initial signal unit depending on the sequence number of the subsequent address message concerned. The first subsequent address message of a call uses heading **1 0 0 0 1**, the second **1 0 0 1 0**, the third **1 0 0 1 1**, etc. While it is preferred to limit the number of subsequent address messages, if more than seven are sent, the sequence is recycled so that the eighth uses heading code **1 0 0 0 1**.

Subsequent signal units of subsequent address messages use the heading code **0 0**.

b) *Signal information*

- *Lone signal unit*

In the case of a one-unit subsequent address message, the signal information field (bits 6-9) contains one of the address signals which are coded as follows:

0 0 0 1 digit 1
0 0 1 0 digit 2
0 0 1 1 digit 3
0 1 0 0 digit 4
0 1 0 1 digit 5
0 1 1 0 digit 6
0 1 1 1 digit 7
1 0 0 0 digit 8
1 0 0 1 digit 9
1 0 1 0 digit 0
1 1 1 1 ST

Codes **1 0 1 1**, **1 1 0 0**, **1 1 0 1**, **1 1 1 0** and **0 0 0 0** are not used in the signal information field of a one-unit subsequent address message.

- *Multi-unit message*

The signal information field of the initial signal unit is coded as **0 0 0 0**.

The signal information field of the subsequent signal units contains the address signals which are coded as follows:

0 0 0 0	filler	(no information)
0 0 0 1	digit	1
0 0 1 0	digit	2
0 0 1 1	digit	3
0 1 0 0	digit	4
0 1 0 1	digit	5
0 1 1 0	digit	6
0 1 1 1	digit	7
1 0 0 0	digit	8
1 0 0 1	digit	9
1 0 1 0	digit	0
1 1 1 1	ST	

Signal information codes **1 0 1 1**, **1 1 0 0**, **1 1 0 1** and **1 1 1 0** are not used in multi-unit subsequent address messages.

The filler code **0 0 0 0** is used, where needed, to complete the signal information field of the last subsequent signal unit of the subsequent address message.

c) *Label*

The assigned label code is used.

3.2.3 *Other telephone signals*

3.2.3.1 *Telephone signals with heading code* **1 0 0 0 0**

The following signal information codes, in conjunction with heading code **1 0 0 0 0**, are allocated:

0 0 0 0 initial signal unit of an initial address message (see Recommendation Q.258, § 3.2.1.2)
0 0 0 1 spare (reserved for international use)
0 0 1 0 spare
0 0 1 1 spare
0 1 0 0 spare
0 1 0 1 spare
0 1 1 0 spare
0 1 1 1 spare
1 0 0 0 spare
1 0 0 1 spare (reserved for regional and/or national use)
1 0 1 0 spare
1 0 1 1 spare
1 1 0 0 spare
1 1 0 1 spare
1 1 1 0 spare
1 1 1 1 spare

The formats for messages using signal information code **0 0 0 1** have not yet been decided. The formats for messages using signal information codes in the range **0 0 1 0** - **1 1 1 1** will be determined by regional organizations and/or national Administrations.

3.2.3.2 *Telephone signals with heading code* **1 1 0 0 0**

The format of one-unit telephone signals using heading code **1 1 0 0 0** is shown in Figure 5/Q.257.

Signals, sent in the backward direction, in lone signal units using heading code **1 1 0 0 0**, are allocated signal information codes as follows:

0 0 0 1 release-guard
0 0 1 0 answer, charge (priority)
0 0 1 1 answer, no charge (priority)
0 1 0 0 clear-back No. 1
0 1 0 1 reanswer No. 1
0 1 1 0 clear-back No. 2
0 1 1 1 reanswer No. 2
1 0 0 0 clear-back No. 3
1 0 0 1 reanswer No. 3
1 0 1 0 spare
1 0 1 1 spare
1 1 0 0 spare
1 1 0 1 spare
1 1 1 0 spare
1 1 1 1 spare

Signal information code **0 0 0 0** indicates that the signal unit is the initial signal unit of a multi-unit message. This facility is reserved for possible future expansion.

3.2.3.3 *Telephone signals with heading code* **1 1 0 0 1**

The format of one-unit telephone signals using heading code **1 1 0 0 1** is shown in Figure 5/Q.257.

Signals, sent in the backward direction, in lone signal units using heading code **1 1 0 0 1**, are allocated signal information codes as follows:

0 0 0 1 spare
0 0 1 0 spare
0 0 1 1 switching-equipment-congestion
0 1 0 0 circuit-group-congestion
0 1 0 1 national-network-congestion
0 1 1 0 spare
0 1 1 1 spare

1 0 0 0 call-failure
1 0 0 1 spare
1 0 1 0 spare
1 0 1 1 spare
1 1 0 0 spare
1 1 0 1 spare
1 1 1 0 confusion
1 1 1 1 spare

Signal information code **0 0 0 0** indicates that the signal unit is the initial signal unit of a multi-unit message. This facility is reserved for possible future expansion.

3.2.3.4 *Telephone signals with heading code* **1 1 0 1 0**

The format of a one-unit telephone signals using heading code **1 1 0 1 0** is shown in Figure 5/Q.257. Signals, in lone signal units using heading code **1 1 0 1 0**, are allocated signal information codes as follows:

0 0 0 1 continuity ⎫
0 0 1 0 clear-forward ⎬sent in the forward direction
0 0 1 1 forward-transfer ⎭
0 1 0 0 spare
0 1 0 1 spare
0 1 1 0 spare
0 1 1 1 spare
1 0 0 0 spare
1 0 0 1 spare
1 0 1 0 reset-circuit ⎫
1 0 1 1 blocking ⎪
1 1 0 0 unblocking ⎬sent in either direction
1 1 0 1 blocking-acknowledgement ⎪
1 1 1 0 unblocking-acknowledgement ⎪
1 1 1 1 message-refusal ⎭

Signal information code **0 0 0 0** indicates that the signal unit is the initial signal unit of a multi-unit message. This facility is reserved for possible future expansion.

3.2.3.5 *Telephone signals with heading code* **1 1 0 1 1**

The format of one-unit telephone signals using heading code **1 1 0 1 1** is shown in Figure 5/Q.257.

Signals, sent in the backward direction, in lone signal units using heading code **1 1 0 1 1**, are allocated signal information codes as follows:

0 0 0 1 address-complete, subscriber-free, charge
0 0 1 0 address-complete, subscriber-free, no charge
0 0 1 1 address-complete, subscriber-free, coin-box
0 1 0 0 subscriber-busy (electrical)
0 1 0 1 unallocated-number
0 1 1 0 line-out-of-service
0 1 1 1 send-special-information tone
1 0 0 0 spare
1 0 0 1 spare
1 0 1 0 address-complete, charge
1 0 1 1 address-complete, no charge
1 1 0 0 address-complete, coin-box
1 1 0 1 address-incomplete
1 1 1 0 spare
1 1 1 1 spare

Signal information code **0 0 0 0** indicates that the signal unit is the initial signal unit of a multi-unit message. This facility is reserved for possible future expansion.

3.2.3.6 *Reserved heading codes*

The signal information codes under the heading codes **0 1 0 0 0**, **0 1 0 0 1**, **0 1 0 1 0**, **0 1 0 1 1**, **1 1 1 0 0**, **1 1 1 1 0** and **1 1 1 1 1** are reserved for regional and/or national use.

Signal information code **0 0 0 0** indicates that the signal unit is the initial signal unit of a multi-unit message. This facility is reserved for possible future expansion.

3.2.4 *Examples of address messages*

Examples of address messages are given below to elucidate the formats and codes adopted for address messages. As there is no telephone signal information contained in the check fields of the signal units, these fields are not shown in the examples.

3.2.4.1 *Transit call* from USA (international exchange New York) to the Netherlands (international exchange Amsterdam) via the United Kingdom (transit exchange London).

Assumptions:
- Semi-automatic traffic, English language.
- The signalling links New York-London and London-Amsterdam are both associated with their respective speech circuit groups.
- Speech path New York-London is a satellite circuit equipped with echo suppressors, speech path London-Amsterdam is a cable circuit not equipped with echo suppressors (due to bilateral agreement between the Administrations concerned).
- Dialled information: 31 2150 43551.
- *En bloc* operation.

a) *Address message New York-London*

1 0 0 0 0 / 0 0 0 0 / 0 0 0 0 1 0 1 / 0 0 1 1
0 0 / 1 1 / 1 1 1 0 0 0 0 0 0 0 1 0 0 0 0 0
0 0 / 1 1 / 0 0 1 1 / 0 0 0 1 / 0 0 1 0 / 0 0 0 1
0 0 / 1 1 / 0 1 0 1 / 1 0 1 0 / 0 1 0 0 / 0 0 1 1
0 0 / 1 1 / 0 1 0 1 / 0 1 0 1 / 0 0 0 1 / 1 1 1 1

b) *Address message London-Amsterdam*

1 0 0 0 0 / 0 0 0 0 / 0 0 0 0 0 0 0 0 / 1 0 1 0
0 0 / 1 1 / 0 1 0 0 0 0 0 0 0 0 1 0 0 0 0
0 0 / 1 1 / 0 0 1 0 / 0 0 0 1 / 0 1 0 1 / 1 0 1 0
0 0 / 1 1 / 0 1 0 0 / 0 0 1 1 / 0 1 0 1 / 0 1 0 1
0 0 / 1 1 / 0 0 0 1 / 1 1 1 1 / 0 0 0 0 / 0 0 0 0

The intermediate CT London serves as a transit exchange.

3.2.4.2 *Direct call* from the Netherlands (international exchange Amsterdam) to USA (international exchange New York).

Assumptions:
- Automatic traffic, ordinary subscriber.
- Speech path Amsterdam-New York is a cable circuit equipped with echo suppressors.
- Speech circuit group Amsterdam-New York has no associated signalling link. Signal information will be transferred via the two signalling links Amsterdam-London and London-New York in tandem, thus using a quasi-associated mode of operation.
- Dialled information: 1 201 949 5813.

- Overlap with subscribers' dialling operation.

a) *Address messages Amsterdam-London*

10000/0000/ 001 0000/1001	⎫	
00/ 10/0010 0000 1010 0000	⎬	Initial address message
00/ 10/0010/1010 / 0001/1001	⎪	
00/ 10/0100/1001 / 0000/0000	⎭	
10001/0101/ 001 0000/1001	-	First subsequent address message
10010/1000/ 001 0000/1001	-	Second subsequent address message
10011/0001/ 001 0000/1001	-	Third subsequent address message
10100/0011/ 001 0000/1001	-	Fourth subsequent address message
10101/1111/ 001 0000/1001*	-	Fifth subsequent address message

* ST-signal, sent if the end of the address has been recognized.

b) *Address messages London-New York*

Exactly the same messages are sent as under a).

The London exchange serves as signal transfer point only. It is assumed that by agreement between the Administrations concerned there is no need for a change of label at this signal transfer point.