INTERNATIONAL TELECOMMUNICATION UNION

ITU-T   Q.257

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 6

SIGNAL UNIT FORMATS AND CODES

GENERAL

ITU-T Recommendation Q.257

(Extract from the *Blue Book*)

NOTES

1   ITU-T Recommendation Q.257 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.

Recommendation Q.257

3.1   GENERAL

3.1.1   *Types of message and signal unit (SU)*

Signalling and other information carried by the common signalling link is transferred by means of messages consisting of one or more signal units.

A **signal unit (SU)** is the smallest defined group of bits on the signalling channel and contains 28 bits.

Dependent upon the number of signal units necessary to transmit one message, the message is called a one-unit message or a multi-unit message.

3.1.1.1   *One-unit message, lone signal unit (LSU)*

A **one-unit message is** a message which is transmitted entirely within one signal unit, Such a signal unit is called a lone signal unit (LSU). It is designed to transmit either:

a)   a single telephone signal,

b)   a signalling-system-control signal, or

c)   a management signal.

3.1.1.2   *Multi-unit message (MUM)*

A **multi-unit message (MUM)** consists of 2, 3, 4, 5 or 6 signal units in tandem. It is designed to transmit a number of related signals (e.g. address signals) in an efficient way. A special case of the multi-unit messages is the initial address message, which is the only one which can have six signal units in tandem and has a minimum of three signal units.

3.1.1.3   **initial signal unit (ISU)**

The first signal unit of a multi-unit message is called the initial signal unit (ISU).

3.1.1.4   **subsequent signal unit (SSU)**

The second and any following signal unit of a multi-unit message are called subsequent signal units (SSU).

3.1.2   *Basic formats*

3.1.2.1   *Basic format of a lone signal unit*
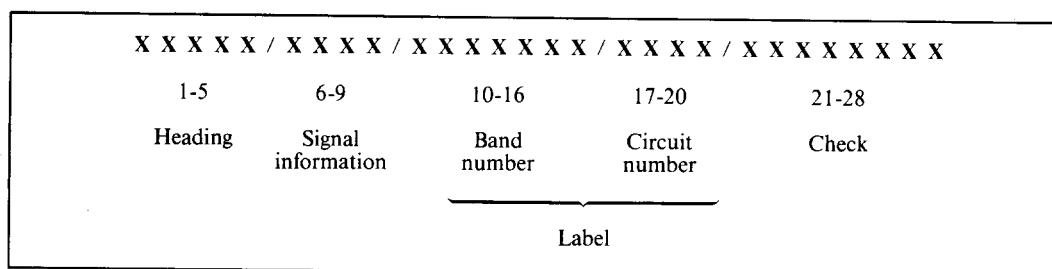
The basic format of a lone signal unit is shown in Figure 5/Q.257.

FIGURE 5/Q.257

Basic format of : – **a lone signal unit**
– **an initial signal unit of a multi-unit message**

The basic format of a lone signal unit is not used in all cases. Where a different format is used it is shown in the sections relating to individual signal units.

3.1.2.2 *Basic format of a multi-unit message*

The format of the initial signal unit of a multi-unit message is shown in Figure 5/Q.257. The use of a special code in the signal information field (bits 6-9) distinguishes an initial signal unit from a lone signal unit. See 3.1.2.1 above.

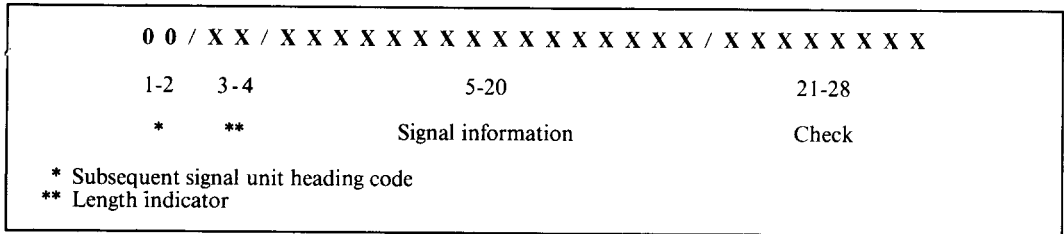The format of a subsequent signal unit of a multi-unit message is shown in Figure 6/Q.257.

```
0 0 / X X / X X X X X X X X X X X X X X X X / X X X X X X X X

1-2    3-4                  5-20                   21-28

 *      **          Signal information             Check

 *  Subsequent signal unit heading code
**  Length indicator
```

FIGURE 6/Q.257

Format of a subsequent signal unit of a multi-unit message

For some messages, the signal information field of a subsequent signal unit (bits 5-20) can be sub-divided, notably in address messages where the field is divided into four 4-bit parts.

3.1.3 *Codes for the general parts of signal units*

The interpretation of a message depends upon a system of codes in various parts of the message.

3.1.3.1 *Heading*

The heading is used to identify the type of:

a)   group of signals,

b)   message, or

c)   signal.

The heading generally consists of the first five bits of the signal units (bits 1-5). There are two exceptions to this rule, viz.:

-    all subsequent signal units are identified by the same 2-bit heading code **0 0** (bits 1-2);

-    the acknowledgement signal unit is identified by a 3-bit heading code **0 1 1** (bits 1-3).

The heading codes are allocated as follows:

0 0	Subsequent signal unit
0 1 0 0 0 **0 1 0 0 1** **0 1 0 1 0** **0 1 0 1 1**	Spare (reserved for regional and/or national use)
0 1 1	Acknowledgement signal unit
1 0 0 0 0	Initial signal unit of an initial address message (or of a multi-unit message)
1 0 0 0 1 **1 0 0 1 0** **1 0 0 1 1** **1 0 1 0 0** **1 0 1 0 1** **1 0 1 1 0** **1 0 1 1 1**	Subsequent address message (one-unit message or multi-unit message)
1 1 0 0 0 **1 1 0 0 1** **1 1 0 1 0** **1 1 0 1 1**	International telephone signals
1 1 1 0 0	Spare (reserved for regional and/or national use)
1 1 1 0 1	Signalling-system-control signals (except acknowledgement signal unit) and management signals
1 1 1 1 0 **1 1 1 1 1**	Spare (reserved for regional and/or national use)

The heading code allocation is also shown in Table 2/Q.257.

3.1.3.2 *Signal information*

Signal units with a 5-bit heading code have a signal information field of four bits (bits 6-9). The signal information field is used:

a) to define a particular signal within a group of signals being defined by the heading code,

b) to define a sub-group within a group of signals, or

c) to indicate that the signal unit is an initial signal unit and that the subsequent signal unit(s) contain(s) a number of signals belonging to the group of signals defined by the heading code.

For case c), the signal information code **0 0 0 0** is used except with heading code **1 0 0 0 0** which alone is sufficient to identify the signal unit as an initial signal unit.

The allocation of signal information codes is shown in Table 2/Q.257.

3.1.3.3 *Label*

Messages which relate to a speech circuit (or a group or sub-group of speech circuits) must carry a label to identify that circuit (or group of circuits). Only one label per message is used.

To identify a group of up to sixteen speech circuits, a 7-bit *band number* is used (bits 10-16).

TABLE 2/Q.257

Allocation of heading and signal information codes

Bits 6-9 \ Bits 1-5	0000X	0001X	0010X	0011X	01000	01001	01010	01011	011XX	10000	10001	10010	10011	10100	10101	10110	10111	11000	11001	11010	11011	11100	11101	11110	11111	Bits 1-5 \ Bits 6-9
0000	SSU				ISU of MUM	ISU of MUM	ISU of MUM	ISU of MUM		ISU of IAM	ISU of SAM 1	ISU of SAM 2	ISU of SAM 3	ISU of SAM 4	ISU of SAM 5	ISU of SAM 6	ISU of SAM 7	ISU of MUM	ISU of MUM	ISU of MUM	ISU of MUM	ISU of MUM	ISU of MMM	ISU of MUM	ISU of MUM	0000
NOT 0000					LSU	LSU	LSU	LSU		ISU of MUM	Lone SAM 1	Lone SAM 2	Lone SAM 3	Lone SAM 4	Lone SAM 5	Lone SAM 6	Lone SAM 7	LSU	LSU	LSU	LSU	LSU	LSU	LSU	LSU	NOT 0000
0000	ONE SSU or FIVE SSUs (IAM only)	TWO SSUs	THREE SSUs	FOUR SSUs	RESERVED FOR REGIONAL and/or NATIONAL USE	RESERVED FOR REGIONAL and/or NATIONAL USE	RESERVED FOR REGIONAL and/or NATIONAL USE	RESERVED FOR REGIONAL and/or NATIONAL USE	ACU	RESERVED FOR REGIONAL and/or NATIONAL USE												RESERVED FOR REGIONAL and/or NATIONAL USE	NMM	RESERVED FOR REGIONAL and/or NATIONAL USE	RESERVED FOR REGIONAL and/for NATIONAL USE	0000
0001											1	1	1	1	1	1	1	RLG		COT	AFC		NMM			0001
0010											2	2	2	2	2	2	2	ANC		CLF	AFN					0010
0011											3	3	3	3	3	3	3	ANN	SEC	FOT	AFX					0011
0100											4	4	4	4	4	4	4	CB 1	CGC		SSB					0100
0101											5	5	5	5	5	5	5	RA 1	NNC		UNN		SNM			0101
0110											6	6	6	6	6	6	6	CB 2			LOS		REGIONAL and/or NATIONAL			0110
0111											7	7	7	7	7	7	7	RA 2			SST					0111
1000											8	8	8	8	8	8	8	CB 3	CFL							1000
1001											9	9	9	9	9	9	9	RA 3								1001
1010											0	0	0	0	0	0	0			RSC	ADC					1010
1011																				BLO	ADN		MBS			1011
1100																				UBL	ADX		SCU			1100
1101																				BLA	ADI		SYU			1101
1110																			COF		UBA		REGIONAL and/or NATIONAL			1110
1111											ST	ST	ST	ST	ST	ST	ST				MRF					1111

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Note — All unassigned codes are reserved for international use. The interpretation of the abbreviations for signals is given in the List of *Abbreviations Specific to Signalling System No. 6* at the end of Part I of this fascicle.

To identify a circuit within a group of up to sixteen speech circuits, an additional 4-bit code (circuit number) is used (bits 17-20). See Figure 5/Q.257.

This provides a total of 11 bits which can be used to identify 2048 speech circuits.

Label codes will be assigned by the Administration concerned.

The label field position is in bits 10-20 of either a lone signal unit or an initial signal unit of a multi-unit message. Subsequent signal units of multi-unit messages do not require a label. Where a 7-bit band number alone is sufficient to identify the destination of a signal (e.g. some management signals), bits 17-20 can contain some further signalling information.

3.1.3.4 *Length indicator*

Subsequent signal units have a length indicator field of two bits (bits 3-4) to indicate the number of subsequent signal units contained in a multi-unit message. Each subsequent signal unit of a multi-unit message carries the same length indicator. The codes used are shown in Table 3/Q.257.

TABLE 3/Q.257

Number of subsequent signal units	Length indicator	
	Initial address message	Other multi-unit messages
1	-	00
2	01	01
3	10	10
4	11	11
5	00	-

The length indicator **0 0** has a different, but unambiguous meaning in the initial address message because the initial address message has a minimum requirement of two subsequent signal units.

3.1.3.5 *Check*

Every signal unit has a check field of eight bits (bits 21-28) for error detection purposes (see Recommendation Q.277).