



SIN 169

Issue 2.1

October 2003

Suppliers' Information Note

For The BT Network

BT International MegaStream (2Mbit/s) Service Description

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1. SCOPE

The British Telecom (BT) International MegaStream service provides an international point-to-point digital private circuit, enabling data transmission at a variety of rates. This Suppliers' Information Note (SIN) describes the 2 Mbit/s customer interface, which offers useable customer data rates of 1920 kbit/s, 1984 kbit/s or 2048 kbit/s.

This SIN does not apply to the BT International MegaStream service which offers 1536 kbit/s or 1544 kbit/s useable data rates (see SIN 139).

This SIN does not apply to the national BT MegaStream service, which is confined to the UK throughout. The Channel Islands and the Isle of Man are, for the purposes of this SIN, considered as part of the national BT MegaStream service.

2. TECHNICAL DESCRIPTION

2.1 Usable Data Rates

The 2Mbit/s BT International MegaStream service is generally intended to provide a useable data rate of 1984 kbit/s. Under some circumstances 1920 kbit/s or 2048 kbit/s useable data rates will be provided. The usable data rates are:

- i) useable customer data rates of 1920 kbit/s or 1984 kbit/s where synchronisation is provided by the BT network.
- ii) useable customer data rates of 2048 kbit/s where synchronisation is not provided by the BT network.
- iii) useable customer data rates of 2048 kbit/s where, due to constraints of certain elements within various international networks, it is essential for the BT network synchronisation to be provided.

Thus the actual data rate to be offered on each occasion is dependant upon:-

- a) restrictions which may be applied by foreign public telecommunication operators (PTOs) whose networks are to be used to provide service to the distant customer.
- b) certain customer requirements where these are compatible with the service offered by all of the public telecommunication networks involved with the provision of that particular service.

2.2 Customer Interface

The customer interface to the service is a 2048 kbit/s digital interface according to ITU-T Recommendation G.703 clause 9, using the co-axial option. The connectors presented by the network are 75 ohm BNC-type sockets.

2.3 Data Structure For 1920 kbit/s or 1984 kbit/s Rates

For Circuits with a useable data rate of 1920 kbit/s or 1984 kbit/s, the data may be structured in a number of ways. Where the available data rate is 2048 kbit/s, structuring is not part of the service and is the responsibility of the customer.

2.3.1 1920 kbit/s Data Structure

The 1920 kbit/s data stream may be structured in one of the following ways:

(a) In strict accordance with ITU-T G.704 (services at 2048 kbit/s). See Figure 1.

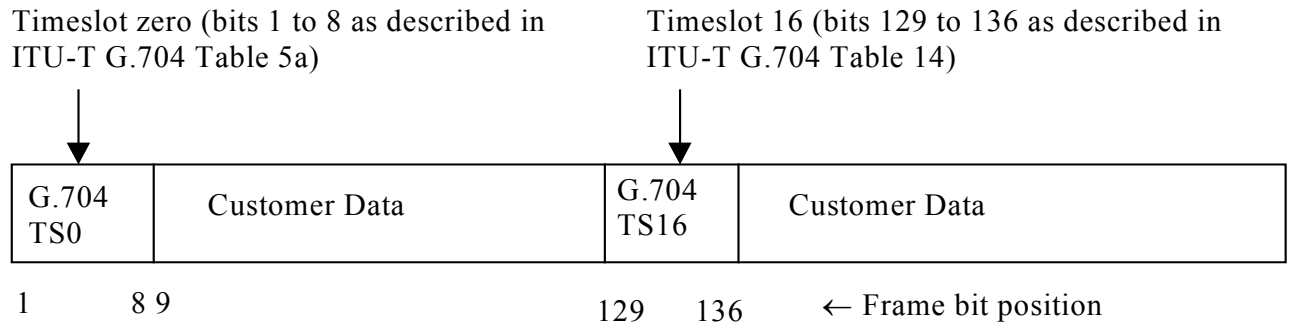


Figure 1. 1920 kbit/s G.704 data structure

(b) with ITU-T compatible timeslots zero and sixteen and data that is structured according to customer equipment requirements. See Figure 2.

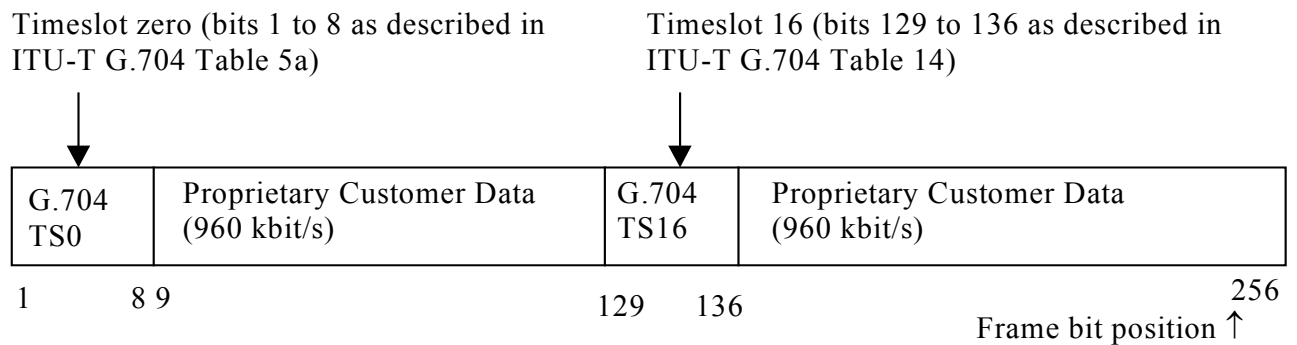


Figure 2. 1920 kbit/s with proprietary customer data structure

(c) with ITU-T compatible timeslots zero leading data that is structured according to customer equipment requirements. The idle eight bits (giving 64 kbit/s) are positioned at the end of the frame structure. See Figure 3.

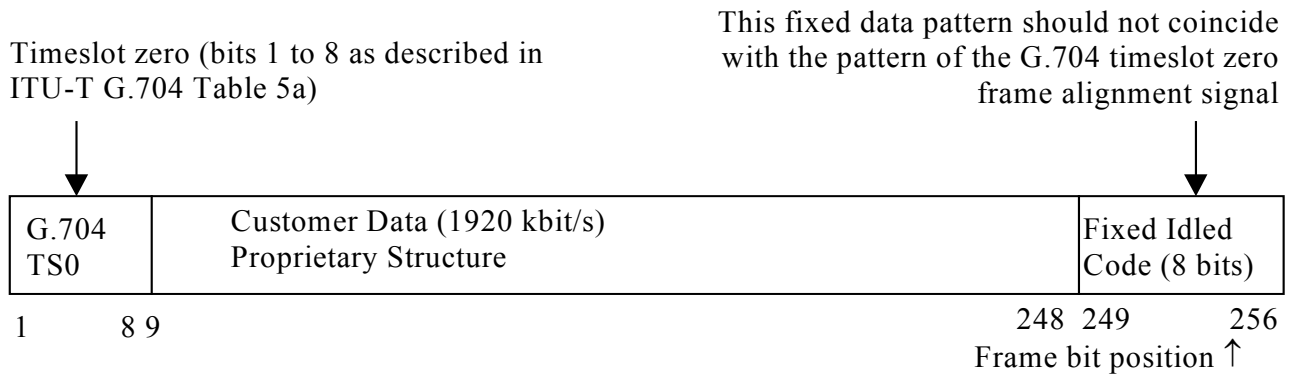


Figure 3. 1920 kbit/s with fixed idle code at the end of the frame

(d) with ITU-T compatible timeslots zero leading data that is structured according to customer equipment requirements. The idle eight bits (giving 64 kbit/s) are positioned centrally within the customer data. See Figure 4.

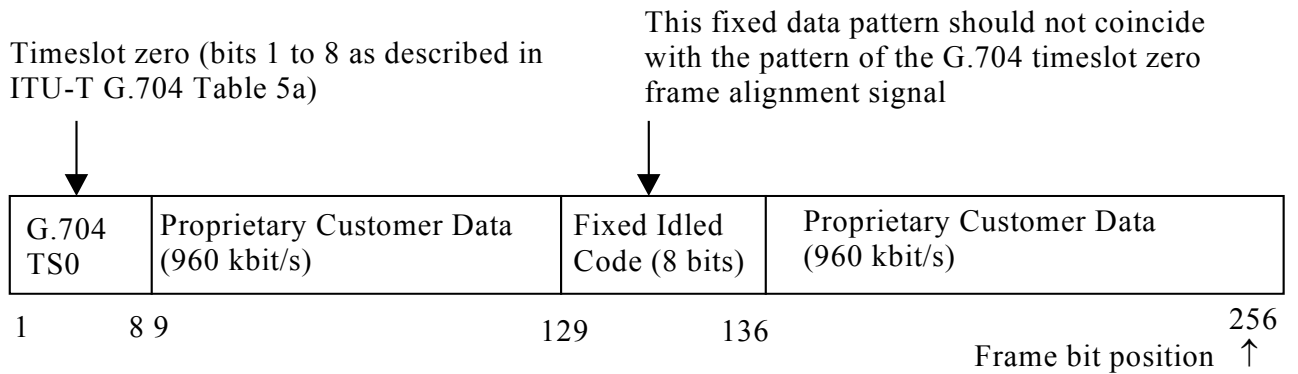


Figure 4. 1920 kbit/s with fixed idle code at the centre of the frame

2.3.2 1984 kbit/s Data Structure

The 1984 kbit/s data stream may be structured in one of the following ways:

(a) in strict accordance with ITU-T G.704 (services at 2048 kbit/s). See Figure 5.

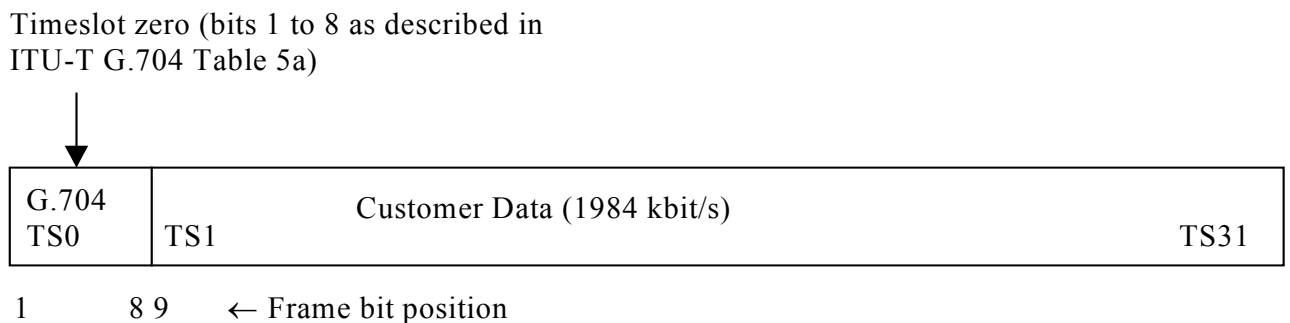


Figure 5. 1984 kbit/s G.704 data structure

(b) with bits 1 to 8 structured in accordance with ITU-T G.704 (services at 2048 kbit/s) leading data that is structured according to customer equipment requirements. See Figure 6

Timeslot zero (bits 1 to 8 as described in ITU-T G.704 Table 5a)

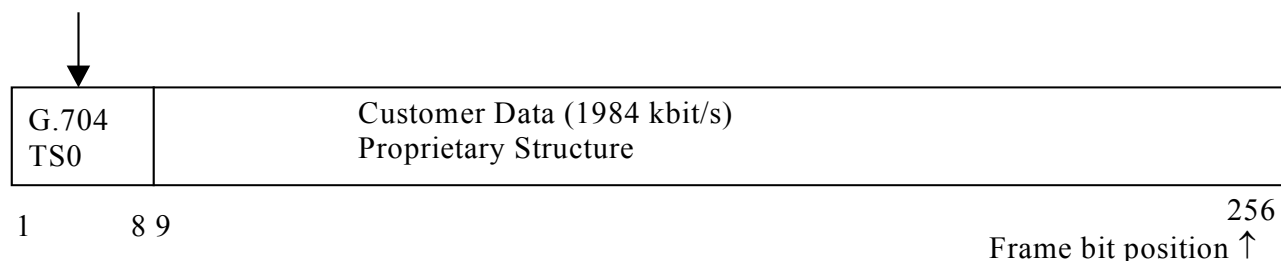


Figure 6. 1984 kbit/s with proprietary customer data structure

2.4 Additional Information

The applicability of the information in this Section depends on which of the data structuring options as described in Section 2.3 the customer's equipment is capable of supporting.

2.4.1 1920 kbit/s structured as in 2.3.1 (a) or (b).

For 1920 kbit/s data streams structured as in 2.3.1 (a) or (b), the redundant information applied in frame bit positions 129 to 136 (Timeslot 16) by the customer equipment should be in accordance with ITU-T G.704 clause 5.1.3.2.2 (including Table 14).

Note 1. Data will not be extended on an end-to-end basis.

Note 2. The information received by the customer's equipment will be in accordance with ITU-T G.704 clause 5.1.3.2.2 (including Table 14) but will not provide a true indication of the signalling status of the overall circuit. A transition of bit 6 of timeslot sixteen (frame zero) from 0 to 1 (active high) will indicate that BT equipment cannot see an appropriate "multiframe alignment signal" from the UK customer (See ITU-T G.732 clause 5.3.2.3 and Table 2). In the event of a 'loss of signal' from the UK customer, bit 3 Timeslot zero and bit 6 Timeslot sixteen (frame zero) will be set together (See also 2.4.3).

2.4.2 1920 kbit/s structured as in 2.3.1 (c) or (d).

For 1920 kbit/s data streams structured as for 2.3.1 (c) or (d), the following apply with regard to the idle code which may be used :-

- (i) To aid circuit testing, the chosen data pattern should be fixed, that is, not change from one frame to another.
- (ii) The ITU-T G.704 'frame alignment signal' pattern (10011011) should not be used.
- (iii) To remove the potential for confusion with a G.704 'multiframe alignment signal', an all zeros data pattern (00000000) should not be used.

Note 1. The code provided by the customer will not be looped back. An "all ones" data pattern (11111111) will be presented by the BT network.

Note 2. It is recommended that the customer's equipment presents an "all ones" data pattern (11111111).

2.4.3 Timeslot zero (1920 kbit/s and 1984 kbit/s)

The potential for customer end-to-end usage of certain nominally spare bits within timeslot zero is currently under review. Such usage, which would in any case be destination dependent, is not currently available. Those bits within timeslot zero that are not specifically used for framing purposes, should be utilised as follows:- (See ITU-T G.704 Table 5a.)

(a) Bit 1 of the 'frame alignment signal' and 'not frame alignment signal' should be fixed at binary 1.

(b) At present, bits 4 to 8 of the 'not frame alignment signal' will not be extended on an end-to-end basis. These bits are considered to be spare and should be fixed at binary 1 accordingly.

Note 1. Bit 3 of the 'not frame alignment signal' provides for a remote alarm indication. The usage and meaning of this alarm will, to a large extent, be dependent upon the equipment configuration used by the associated distant PTO. However, bit 3 (active high) will be set and extended to the UK customer if any of the following conditions are observed, by BT equipment:-

- (i) 'Loss of incoming signal' (ITU-T G.732) from the distant PTO or the UK customer.
- (ii) 'Alarm Indication Signal' (ITU-T G.732) from the distant PTO or the UK customer.
- (iii) Bit 3 not frame alignment signal' set high within the signal from the distant PTO.

Note 2. In each case specifically mentioned in Note 1 (i), (ii) and (iii) above, bit 3 of the 'not frame alignment signal' will additionally be set and extended towards the distant PTO's equipment. Dependent upon the distant equipment configuration, bit 3 may be set if other conditions are observed.

2.5 Circuit Timing

Circuit timing may be obtained from:

(a) the BT Kilostream network (i.e. those described in 2.1 (i) and (iii)), where the customer equipment is capable of extracting timing directly from the digital signal presented by the BT International MegaStream service.

(b) For connection to circuits that are synchronised to the BT Kilostream network (i.e. those described in 2.1 (i) and (iii)), where the customer equipment is capable of extracting timing from a private customer network or clock source.

Note. Where timing is not derived from a BT KiloStream source, the following should be noted:

- (i) Operation between the customer's equipment and the BT network will be plesiochronous in this case.
 - (ii) The derived timing should ideally have an overall accuracy of at least 10^{-11} .
 - (iii) It should be appreciated that dependence on a non-BT originated clock source will increase the likelihood, on an end-to-end basis, of a slip rate greater than one in seventy days. This is due to the additional plesiochronously coupled section.
- (c) For connection to circuits with a usable data rate of 2048 kbit/s which are not synchronised to the BT network (i.e. those described in 2.1 (ii)), where the provision of circuit timing (2048 kbit/s \pm 50ppm) is the responsibility of the customer.

3. GLOSSARY

BNC	Bayonet Nut Connector
ITU-T	International Telecommunications Union For Telecommunications (formerly CCITT)
NTE	Network Terminating Equipment
ppm	Parts per million (10^6)
PTO	Public Telecommunication Operator
SIN	Suppliers' Information Note
TE	Terminal Equipment
TS	Time slot

Throughout this SIN references to Timeslot zero or Timeslot sixteen have the following meanings:-

Timeslot zero (TS0) - Bits 1 to 8 of the 256 bit frame as described in ITU-T G.704 clause 2.3.2.

Timeslot sixteen (TS16) - Bits 129 to 136 of the 256 bit frame as described in ITU-T G.704 clause 5.1.3.2.2.

4. REFERENCES

ITU-T Recommendation:

G.703	Physical/Electrical characteristics of hierarchical digital interfaces	11/2001
G.704	Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels	10/1998
G.732	Characteristics of primary PCM multiplex equipment operating at 2048 kbit/s	11/1988

Suppliers' Information Note:

SIN 139	2048 kbit/s Interface to the BT Network Providing Access to International 1544 kbit/s Networks – Service Description	Latest Issue
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For further information or copies of referenced sources, please see document sources at <http://www.sinet.bt.com/usenum.htm#docsources>

5. HISTORY

Issue 1	December 1989	First Issued.
Issue 2.0	September 2002	Information from withdrawn SIN 170 incorporated and editorial updates.
Issue 2.1	October 2003	ITU-T Recommendation references updated. Republic of Ireland removed from national product consideration statement in Section 1. Approval Requirements statement removed, information available via SINet Useful Contacts page.

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