

Transmic 2G Card Operation Manual

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STATUTORY NOTICES

APPROVAL

The approval number for the DT310 Dual LIU is NS/3660/12/H/452538.

The DT310 Dual LIU is approved for direct connection to G.703 2048 kbit/s private circuits subject to the following conditions:

- 1) The Dual LIU is used in a Series 3000 multiplexer chassis.
- 2) WARNING. Interconnection directly, or by way of other apparatus, of ports marked:-

"WARNING. CONNECT ONLY APPARATUS COMPLYING WITH BS6301 TO THIS PORT".

or

"WARNING. CONNECT ONLY APPARATUS COMPLYING WITH BS6301 TO THESE PORTS".

with ports marked or not so marked may produce hazardous conditions on the network. Advice should be obtained from a competent engineer before such a connection is made.
- 3) All ports, other than those connected to Public Telecommunication Networks, may only have equipment complying with BS6301 connected to them.

The safety status of all ports is SELV



Case Technology Ltd declare that this product conforms with the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic protection.

This equipment has been tested using shielded cables supplied by Case Technology Ltd. These cables, or equivalents, must be used to ensure compliance with this declaration.

All PCB assemblies contain Electrostatic Sensitive Devices (ESDs) which may be permanently damaged if incorrectly handled. This equipment must be handled in accordance with BS5783 code of practice for the handling of electrostatic sensitive devices.

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Transmic 3G Card

1. Introduction

This manual is intended to be read in conjunction with the standard 3000 series manuals and the Dual LIU manual.

The 'TRANSMIC 2G' (T2G) adaptation for a 3000 series multiplexer, provides a simple remote maintenance system, via CAS channels, which may be used by Customers or Network Controllers in French digital networks. The adaptation also provides additional AIS and loss of primary sync fault reporting via TS0 spare bits. The T2G adaptation only affects the signalling paths for Port 1 of the 3000 series multiplexer, all other data and signalling paths are unaffected.

The primary interface to the network is a standard 2048kbit/s CCITT G.703/G.704 PCM interface with special use of bit 'c' in the timeslot 16 Channel Associated Signalling channel. TS16 bit 'c' is used to transport an information frame which provides simple maintenance loop facilities and limited fault reporting.

The Transmic 2G adaptation operates in any 3000 series chassis variant. The facilities provided by the system are as currently provided by the 3000 series multiplexers with DT981/5 or later firmware, with additional menus for Transmic 2G Bit 'c' functions. This firmware is designated DT982/1 There are a few restrictions regarding the use of 'Smart' cards in Ports 3 and 4.

In all cases, the T2G system only generates Transmic 2G framing towards the Network Control centre (network), and monitors Transmic 2G frames from the Network Control Centre.

All references to CCITT G series specifications refer to the Blue book.

See Appendix 1 for a block diagram of the T2G network and a pictorial representation of loop definitions.

2. T2G Adaptation Upgrade Details

Replace the standard System Controllers and Dual LIU(s) with:-

DTE222 = DT301 (Modified System Controller) + DT302 (DSP daughter board) + DT982 (System Controller Firmware)

DTE242 = Standard DT310 (Dual LIU) + DT987 (Dual LIU firmware) + DT995TRT Dual LIU Patchfield.

3. Reference Specifications

Specification Technique ST/PAA/RDS/LRS/2480 (JAN 1990).

CCITT Recommendations G.704 and G.706 blue book.

Cray Communications Specification 9500SS02: CRC-4 implementation.

4. Multiplexer types

In the Transmic 2G system there are three generic types of multiplexers, 'Normal', 'Network' and 'Customer' which are soft configurable. The 3000 series 'Install' (!OI) menu is used to allow the user to identify the multiplexer type. The multiplexer type defines the multiplexers relative position within the Network and certain operational characteristics outlined below.

A 'Normal' multiplexer disables all Transmic 2G operations apart from TS0 operations on the Dual LIUs (DT987)

A 'Network' multiplexer is closest to the network (considered to be part of the network), and the 'Customer' multiplexers are connected via 2Mbit links to the 'Network' multiplexer. A 'Customer' multiplexer may only generate Loop 2 commands. The 'Network' multiplexer may generate Loop 2 or Loop 3 commands, and ignores loop commands which are identified as being for a 'Customer' multiplexer by the message protocol.

Each multiplexer is capable of decoding all types of loop (HDB3, Loop 3(2)), and actioning them where appropriate and supported by 3000 series channel cards.

The user may connect up to 3 'Customer' multiplexers to one 'Network' multiplexer, but it is not possible to connect a 'Customer' multiplexer to a 'Customer' multiplexer.

5. HDB3 (2048kbit/s G.703) Port Types

There are four software configurable types of HDB3 port (DLIU line 1 or 2) defined in the system:-

1) Network port; 2) Customer Port; 3) Subscriber port; 4) Normal port.

The T2G System can support up to a maximum of four HDB3 (2Mbit/s) ports. The user may only place HDB3 ports in ports 1 and 2 of the 3000 series multiplexer. Via the 3000 series 'Install menu (!OI), the user may specify the types of HDB3 ports in Port 1 and 2. A maximum of 2 Network ports may be specified. The 2Mbit/s HBD3 ports are provided by a Dual LIU fitted with DT987 firmware.

The user is constrained to place Network ports in Port 1. If only one Network Port is to be used, either Port 1 Line 1 or Port 1 Line 2 can be selected. Selecting any menu command which does not have the respective port enabled as a Network port, will result in the error message 'Error nport x not selected' where x = Network port number.

5.1 Network port

Only the Network ports are capable of encoding or decoding Transmic 2G bit 'c' signalling frames, and provide the Network facing connection of each multiplexer type.

The Network port forwards Transmic 2G framing transparently from the Network Control Centre to the other HDB3 ports, but blocks Transmic 2G framing towards channel cards. In the case of the channel cards the CAS codes are passed through a signalling converter in order to ensure compatibility.

Towards the Network Control Centre, the Network port overwrites all bit c's with the current status as viewed by the Network port, except for Customer port connections.

In the case of a Customer port connection, which may be carrying Customer multiplexer loops to the network, the Network port is transparent to Transmic 2G framing whilst it is in the Normal (Idle) state, otherwise it asserts it's own framing.

5.2 Customer Port

The Customer port provides the Network multiplexer end of the 2Mbit/s link between a Network and Customer multiplexer.

The Customer port is transparent to Transmic 2G signalling frames either towards or away from the Network Control Centre.

5.3 Subscriber Port

Subscriber ports provide a 2Mbit/s connection to the network. The port itself is transparent to Transmic 2G signalling frames either towards or away from the Network Control Centre, but the signalling is intercepted by the Network port towards the Network Control Centre if the network needs to generate bit 'c' framing to the network.

5.4 Normal Port

All Transmic 2G loop functions are totally disabled. The 2Mbit/s port operates as normal, transparent to CAS signalling except for the additional TS0 functions.

6. Loop Types

The following sub-sections define the various loops and introduce terminology used within the T2G system.

6.1 HDB3 Loop

These loops are 2Mbit/s port loops applied to Customer or Subscriber ports (not Normal or Network) by the Network or Customer multiplexer at the point furthest away from the Network Control Centre. The whole HDB3 port is looped towards the Network Control Centre, and unframed AIS is sent away from the Network Control Centre.

It is possible, on a HDB3 port basis, to disable or enable activation of a HDB3 loop from the Network via the maintenance menu 'Loop' 'Inhibit' function (!MDLRLI).

6.2 Loop 3

These loops are applied to non HDB3 ports by a Network or Customer multiplexer at the point furthest away from the Network Control Centre. These loop the data towards the Network Control Centre and back to its source as defined by Channel card X.150 loops.

6.3 Loop 2

These loops are applied remotely to onward data channels beyond the Network or Customer multiplexer, via controlling external units eg. Base band termination units, to execute the loop.

These loop data towards the Network Control Centre at the point furthest away from the Network Control Centre.

Note: No current channel cards support Loop 2 facilities and all Loop 2 commands are implemented as Loop 3 by the 3000 series multiplexer.

6.4 Local Loop

These are Loops applied locally to the multiplexer via standard 3000 series maintenance 'Loop' commands (!MDL).

6.5 Remote Loops

These are any loops activated via Transmic 2G network commands.

6.5.1 Network Remote Loop

Remote loop coming from the Network Control Centre, via bit 'c' framing, into the multiplexer.

6.5.2 Local Remote Loop

Remote Loop command generated, via 'Maintenance' - 'remote Loop' - 'Set' (!MDLRLS) function, into the Network towards the Network Control Centre by the multiplexer.

7. TS0 processing

TS0 processing, including CRC-4, is as provided by 3000 Build 5 or later firmware, except for the definitions of Sa4 to Sa8. The use of Sa4 to Sa8 are as defined below.

7.1 Sa4

On the Output side (towards the network), Sa4 is normally set to 1. On receipt of AIS, Sa4 is set to 0 within 100 ms of detection.

On the input side, receipt of Sa4=0 generates a Smart fault 'Remote AIS'. This allows network operators to isolate an AIS condition within a normal RAI (Sa3 bit).

7.2 Sa5

On the output side (towards the network), Sa5 is normally set to 1 indicating synchronisation to the line (network). Sa5 is set to 0 when the multiplexer is free running from its own internal clock. On the input side, this bit is ignored.

7.3 Sa6

On the output side (towards the network), Sa6 is forced to 1. On the input side this bit is ignored.

7.4 TS0 management (Sa7,Sa8)

Normally these bits are set to 1

Special, non standard patchfields for the Dual LIU are defined to allow access to TS0 bits 7,8 for NCS management.

8. TS16 bit 'c' processing

8.1 Bit c Frame definition

The Bit c frame is cyclic every 15 bits (30ms), and is defined as follows:

bit:	15					10									5				1
	1	1	1	1	RF	LF	1	ACK	HC	L3C	L2C	OL	ET	1	SA				

where:

Bit 1 (SA). Synchronisation Alignment, 01010101.... pattern

Bit 2. 1 = No action

0 = Ignore all incoming loops

Bit 3 (ET). Equipment type address for HDB3 loop command:

0 = Customer multiplexer

1 = Network multiplexer

Bit 4 (OL). Origin Identification for loop 2 and 3 command:

0 = origin is Customer multiplexer

1 = origin is Network multiplexer

NOTE: If there is no loop command active, bits 3 and 4 have no significance and will be set to 1.

Bit 5 (L2C). Loop 2 command, active at 0

NOTE: This command will be decoded as a loop 3 by 3000 series multiplexers.

Bit 6 (L3C). Loop 3 command, active at 0.

Bit 7 (HC). High Bit Rate HDB3 port loop command, active low

NOTE: bit 7 will only be used when the receiving equipment provides a 2048 kbit/s HDB3 termination

Bits 5,6,7 will stay active as long as the loop is maintained

Bit 8 (ACK). Loop Acknowledge, active 0 and will stay active whilst the originating loop lasts. Reference Transmic 2G Fault Response section.

Bit 9. Not supported, permanently set to 1.

Bit 10 (LF) . Local Tributary Fault. Set to 0 if a fault is detected. Reference Transmic 2G Fault Response section.

Bit 11 (RF). Remote Tributary Fault. Set to 0 if a fault is detected. Not supported, permanently set to 1.

Bit 12. Not supported, permanently set to 1.

Bits 13, 14, and 15. Reserved for future use. Set to 1.

8.2 Standard frames

The Transmic 2G system only responds to, or generates, standard Transmic 2G frames. These standard frames, defined below, generate the messages specified below in the maintenance 'Status' menus.

1) Bit 10 (Local Tributary Fault) and Bit 8 (ACK) are monitored, and reported separately.

2) The Loop Ack bit(Bit 8) is qualified with the current Local Remote loop status in order to determine if the remote multiplexer has set the

acknowledge bit as an acknowledgement of a Network remote loop, or indicating the remote multiplexer has applied a Local Loop.

Non standard frames will be ignored, but may be viewed via the maintenance 'Status' menu.

Modified Frame Value (hex)	Status Report
FFBF	HDB3 on Nmux
FFBB	HDB3 on Cmux
FFEF	Loop2 from Network
FFE7	Loop2 from Customer
FFDF	Loop3 from Network
FFD7	Loop3 from Customer
FF7F	Loop Ack
FDFD	RA (Remote Alarm)

Note.

a) Bit allocations are (| marks the Hex boundaries) as follows:-:

1,1,1,1 | 1,1,LF,1 | ACK,HC,L3C,L2C | OL,ET,1,SA is forced to 1 (b1)

8.3 Bit 'c' States

Transmic 2G Bit 'c' has five general states: Idle; Sync frame defined (SD); Loss of Sync (LS); All ones (AIS(c)) and Sync frame undefined (SUD). These states are described below.

8.3.1 Idle State

All Bit 'c's in a frame are set to 0. This state is assumed at power up or system reset on the receive side. If none of the other state conditions are met, then the system defaults to the Idle state. This state is the normal operating state when no loops etc. are being transmitted.

8.3.2 Synchronised Frame Defined State (SD)

This is the state where the system has locked on to the synchronisation bit pattern (...010101010...) in the frame (SA=bit 1) and is receiving the message frame which has all bits stable for three frames in four.

Note: The stable bit window is non overlapping between blocks of four sequential bits.

8.3.3 Loss Of Sync State (LS)

The system has lost synchronisation but not yet found AIS(c) or Idle states or re-synchronised. This state is usually a transitory state. Any loops applied in the synchronised state are removed along with the appropriate acknowledge framing.

8.3.4 AIS(c) State

All bit 'c's in a frame are set to 1. This state usually indicates a fault condition on the line.

9. Nx64kbit/s services

Where an HDB3 port except for a Customer port or Channel Card circuit is assigned a block of N timeslots for a Nx64kbit/s (N=1 to 30) service, only CAS signalling for the first timeslot (lowest number) assigned is checked for Transmic 2G bit 'c' signalling protocol. In the case of a Customer port, all timeslots assigned will be checked for Transmic 2G bit 'c' signalling protocol.

The loop state indicated by Transmic 2G frame of the first timeslot is applied to all N timeslots of that block. The Transmic 2G framing output is repeated in all bit 'c's of CAS signalling nibbles for the whole block of timeslots.

Note: An Nx64k block does not have to be consecutive timeslots, the system determines an Nx64k block by searching the cross connect map for all timeslots cross connected from the Network port to the same port and circuit. The first timeslot of the block is taken as the lowest timeslot number of the Nx64k block on the Network port side of the cross connect matrix.

10. Rules for application of loops

Note: There is no buffering of local loop requests, therefore once a local loop has been superseded by the network or ignored, the local loop request is lost.

10.1 Local Loop

If a Network Remote loop is currently active for a particular tributary (channel card) circuit, the control of the loop remains with the Network and the request for a local loop is ignored. The message 'Local Loop Request ignored' is output at the VDU.

If a Network Remote Loop occurs whilst a Local loop is active, control of the loop passes to the Network. Once the loop is under the control of the Network, it may only be removed by the Network.

The user may determine if this has happened via the fault log. When the local loop is applied, the standard loop fault message occurs.

When the network takes over, the standard loop fault will clear and the fault 'Rem Local Loop' occurs.

Local loops may removed as per 3000 series equipment only if control has not passed to the Network.

10.2 Network Remote Loop

If the system is in the synchronised state, the received frame matches one of the standard loop frames and the loop is supported by the channel card, then the loop specified is set.

On application of the Network Remote Loop, the system reports a fault message 'Rem Local Loop' occurs against the circuit it is applied to, and the Loop Acknowledge framing is asserted (bit 8=0) to the bit 'c' output.

It is not possible to acknowledge a remote loop from the Network Control Centre, and set a Local Remote loop request simultaneously within the same Transmic 2G output frame. In the case where the user requests a Local Remote Loop whilst currently acknowledging a loop from the Network Control Centre, the Local Remote loop request will be ignored. The message 'Remote Loop Request ignored' is generated.

In the case where a valid Network Remote loop request occurs whilst currently generating Local Remote Loop framing to the Network Control Centre, the Local Remote loop request is removed and acknowledge framing asserted.

The user can determine if this has happened via the fault log. When the Local Remote Loop framing is asserted, the fault 'Rem Loop Set P1(2)(3)(4)' occurs. When the network takes over, this fault will clear and the fault 'Rem Local Loop' occurs.

10.3 Local Remote loop

On request of a local remote loop, the appropriate Transmic 2G framing is generated unless currently acknowledging a Network remote loop.

On application of the local remote loop framing, the system reports 'Rem Loop Set P1(2)(3)(4)' fault occurs, and the appropriate System Controller Port LED is illuminated.

If a valid loop request from the Network Control Centre occurs during a Local Remote loop framing, the Network Remote loop request will be serviced and override the outgoing framing with Acknowledge framing. The user can determine this has happened via the fault log as described above.

10.3.1 Network multiplexer

Access via the local port, allows only Loop 2 and Loop 3 to be requested.

10.3.2 Customer multiplexer

Access via the local port only allows a Loop 2 to be requested.

11. Configuration of T2G Timeslot

In order for the T2G system to recognise a timeslot as a valid Transmic 2G timeslot, the following conditions must be satisfied.

- 1) The timeslot must be enabled via the Edit/Modify Transmic Menu option (!CCEMT) as a T2G timeslot.
- 2) The timeslot must have a DUPLEX cross connection from the Network port.
- 3) If the cross-connection is to a Port 3 or 4 timeslot, the destination timeslot must have a circuit assigned to it.

These conditions ensure a cross connection is fully specified.

12. Menus

The menu structure is as currently provided on the Build 5 firmware with the following modifications described in the following sections.

In general:

- 1) The Install menu allows the user to configure the multiplexer type and the HDB3 port types;
- 2) The Maintenance menu options allow the user to set Local Remote loops, view Transmic 2G frame status, and Disable/Enable HDB3 loops;
- 3) The Edit/Modify menu options allow the user to configure Network Port timeslots to be Transmic 2G timeslots or non 2G timeslots.

12.1 mOde Install options

In addition to the standard installation configuration elements, the following options are provided for the Transmic 2G version. After completing installation, the user must run a configuration to implement the T2G install changes.

The following 'Install' options are provided:-

Transmic 2G Mux type is Normal (0=Normal 1=Customer 2=Network) >

If the user selects Transmic 2G Mux type as Customer, then the following options are presented:

Transmic 2G Mux type is Normal (0=Normal 1=Customer 2=Network) >1

Port 1 Line 1 is Network (0=Normal 1=Network) >1

Port 1 Line 2 is Subscriber (0=Normal 1=Subscriber 2=Network) >1

Port 2 Line 1 is Normal (0=Normal 1=Subscriber) >0

Port2 Line 2 is Subscriber (0=Normal 1=Subscriber) >1

If the user selects the Transmic 2G Mux type as 'Network', then the following options are presented:

Transmic 2G Mux type is Normal (0=Normal 1=Customer 2=Network) >2

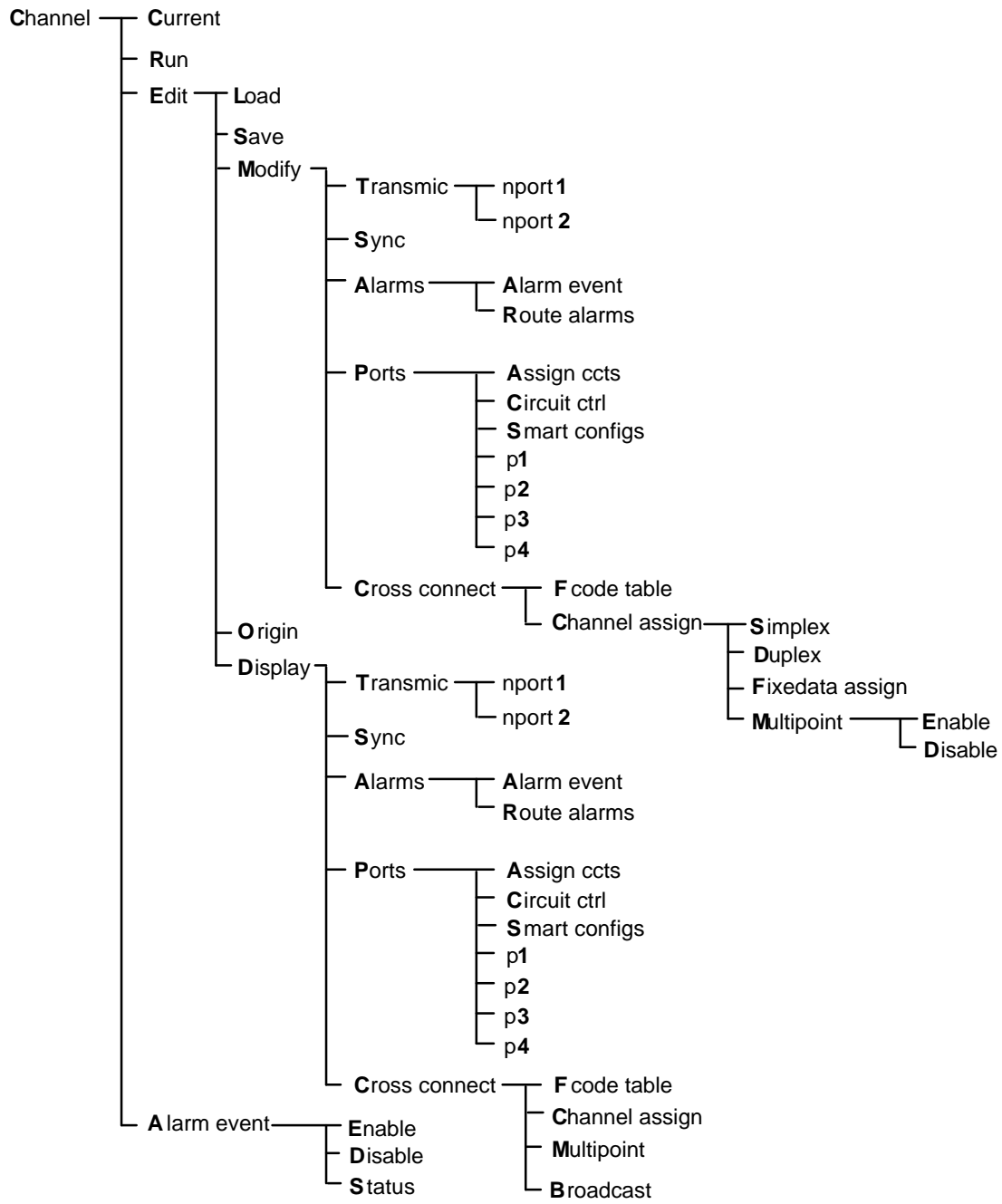
Port 1 Line 1 is Network (0=Normal 1=Network) >

Port 1 Line 2 is Subscriber (0=Normal 1=Customer 2=Subscriber 3=Network)>

Port 2 Line 1 is Customer (0=Normal 1=Customer 2=Subscriber) >

Port 2 Line 1 is Subscriber (0=Normal 1=Customer 2=Subscriber) >

12.2 Edit/ Modify Options



12.2.1 Transmic Menu

This menu option allows the user to select which timeslots within each Network port are Transmic 2G timeslots. This allow the user to mix non 2G timeslots with 2G timeslots on the same Network Port.

The user may select blocks or individual timeslots to Enable ('E') or Disable ('D') which is the default setting.

Note TS0 and TS16 are omitted automatically.

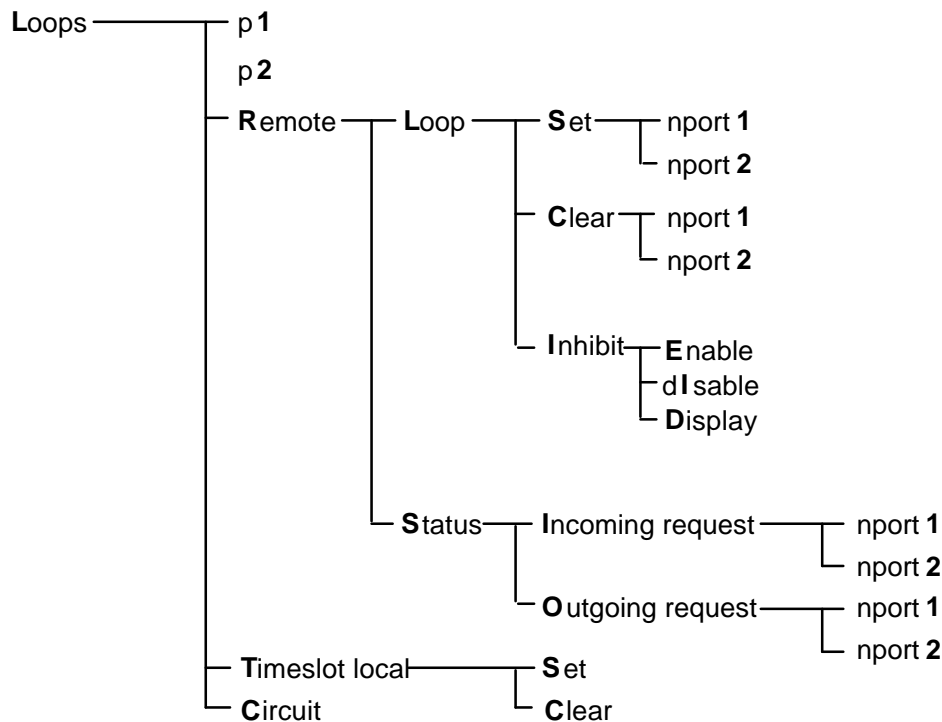
Modify Example

```
(CCEMT) nport 1 | nport 2 >1  
start timeslot, end timeslot >29  
S1,TS 29 Disabled >E  
S1,TS 30 Enabled >D  
S1,TS 31 Disabled >E  
(CCEMT) nport 1 | nport 2 *>
```

Display Example

```
(CCEDT) nport 1 | nport 2 >1  
start timeslot, end timeslot >29  
S1,TS 29 Enabled  
S1,TS 30 Disabled  
S1,TS 31 Enabled  
(CCEMT) nport 1 | nport 2 *>
```

12.3 Maintenance Loop Options



12.3.1 Re-configure Option

The re-configure option provided by a 3000 series chassis, clears all local loops applied to the multiplexer except 'Remote Local loops'.

12.3.2 Remote Loops options

These options allow the user to control the Transmic 2G framing output or view the incoming Transmic 2G framing. The user may only operate on the first timeslot of an assigned Nx64k block. Selection of any other timeslot generates the message 'Invalid T2G timeslot'.

12.3.2.1 Loop Set Menu

This menu option allows the user to set Local Remote loop framing output. The menu displayed will vary depending upon whether the multiplexer is a Customer multiplexer or a Network multiplexer.

Example Network Mux

```
(MDLRL) Set | Clear | Inhibit >S  
(MDLRLS) nport 1 | nport 2 >1  
1=Loop 2  
2=Loop 3  
timeslot,type >7,2  
(MDLRLS) nport 1 | nport 2 *>
```

Example Customer Mux

```
(MDLRL) Set | Clear | Inhibit >S  
(MDLRLS) nport 1 | nport 2 >1  
Loop 2  
timeslot >1  
(MDLRLS) nport 1 | nport 2 *>
```

If the T2G framing loop is being output, the system generates the fault message 'Rem Loop Set P1(2)(3)(4)'. If currently acknowledging a network loop, the request is ignored and the message 'Remote Loop Request ignored'.

12.3.2.2 Loop Clear Menu

Example

```
(MDLRL) Set | Clear | Inhibit >C  
(MDLRLC) nport 1 | nport 2 >1  
timeslot >7  
(MDLRLC) nport 1 | nport 2 *>
```

12.3.2.3 Inhibit Menu

This menu function allows the user to either inhibit or enable (default) a remote Transmic 2G 2Mbit/s HDB3 loop command from setting an HDB3 loop on the local equipment in Ports 1 or 2.

12.3.2.4 Inhibit Enable/Disable Menu

This menu option allows the user to either enable or disable the inhibit function on a port basis. If the inhibit is enabled, any remote Transmic 2G 2M HDB3 loop command received for that port will not be actioned but may be viewed in the status report. See 14.3.3 for fault reported.

Note: The enable/disable function does not affect cards which cannot accept HDB3 loops fitted to these ports, and the user is restricted to specifying non network port circuits and a circuit in port 1 or 2.

```
(MDLRL) Set | Clear | Inhibit >I
(MDLRLI) Enable | disable | Display >E
port, circuit > P1,A2
(MDLRLI) Enable | disable | Display >I
port, circuit > P1,A2
(MDLRLI) Enable | disable | Display >
```

12.3.2.5 Inhibit Display Menu

This menu allows the user to view the HDB3 Loop Inhibit status.

```
(MDLRLI) Enable | disable | Display >D
Port 1,A2 disabled
Port 2,A1 enabled
Port 2,A2 enabled
(MDLRLI) Enable | disable | Display >
```

12.3.3 Remote Status Menu

The status menu allows the user to view the status of the Transmic 2G framing from the Network, and generated by the selected Network Port.

```
(MDLR) Loops | Status >S
(MSLRS) Incoming | Outgoing >
```

12.3.3.1 Incoming/Outgoing Menu

These commands display the incoming/ outgoing T2G timeslots status for all the first timeslots of all T2G Nx64k blocks currently active on the selected Network port. All timeslot references refer to the Network port timeslots.

The Status report display format is as follows:-

First Timeslot<, Rx(Tx) status><,Rx(Tx) 2G Frame Hex value><,Decoded message><,RACK><,RA>

where <abc> indicates the abc may or may not be present in the output string depending upon the current T2G framing status.

Notes:-

- a) <, Decoded Message> is printed if and only when a match is found between frame value and standard frame definition.
- b) <,RA> is printed when bit 10 (local fault) =0
- c) <,RACK> is printed when bit 8 (ack) =0 and Local Remote Loop request has not been made.
- d) <,Rx(Tx) 2G frame hex value>. On the receive side, this is only printed if frame synchronisation achieved. Bit 1 and Bit 16 are force to 1 for display purposes.
- e) <,Rx(Tx) Status> messages are as follows.

i) Trans.

This will indicate that the respective block of timeslots are being passed transparently to its destination with no insertion or blocking of Transmic 2G framing eg Customer port connection.

ii) 2G LOF

This message is displayed when Transmic 2G frame synchronisation has been lost, but none of the other states has been achieved.

iii) AIS(c)

This message is displayed when AIS(c) is detected or being transmitted.

v) Idle

This message is displayed when Idle is detected or being transmitted.

For example;

(MDLRS) Incoming request | **Outgoing request** >I

(MDLRSI) nport **1** | nport **2** >1

TS1, Trans

TS5,FFBFH,HDB3 on CMux

TS13,FF7FH, Loop Ack

TS16,2G LOF

TS24,FFE7H,Loop 2 from Customer

TS28,FDBFH,HDB3 on Nmux,RA

TS29,FF3FH,HDB3 on Nmux,RACK

TS31,AIS(c)

The user may append an R to the end of the command string to continuously repeat the Status report.

For example:

(MDLRSI) nport **1** | nport **2** >1R

13. Transmic 2G Local Loop fault reporting

For the type of tributary cards listed below, and where loops are supported by current channel cards, the Transmic 2G frame reports the application of a local loop (i.e. non network controlled loop) to the Network as follows:-

<u>Type of Access</u>	<u>Local Loop</u>
64 kbit/s G.703	c8=0 (normally c8=1)
2Mbit/s G.703/G.704	c=1=AIS(c)
X.24/V.11	c8=0 (normally c8=1)

In this situation, it is possible for the user to command a Local Remote Loop framing (i.e. Loop2(3) command with Bit 8 (Ack) =0). This condition is highlighted by the RACK status report being present, as opposed to the Loop Ack.

14. Transmic 2G Fault Reporting.

The system provides the standard Fault reporting via local VDU port and LEDs as currently provided by 3000 series with the following additional Faults.

4.1 Key to Fault Tables

a) Alarms

*	=	Actioned by software.
P	=	Prompt alarm.
S	=	Service alarm.
SYS	=	System alarm.
F	=	Remote alarm.
MF	=	Multiframe alarm.
AIS	=	Alarm Indication Signal.
16A	=	Tslt 16 AIS.
SIG	=	Signalling Fcodes to MUX, FH on through timeslots.
TS	=	Data Fcodes to MUX, FFH on through timeslots + TS0 spare bits to '1'.
NT	=	Network Control System (NCS) Alarm Level

b) System Controller LEDs

1	=	Miscellaneous
2	=	Port 1 alarm
3	=	Port 2 alarm
4	=	Port 3 alarm
5	=	Port 4 alarm
6	=	Not Primary sync source
7	=	PSU fault
8	=	System alarm
9	=	Card active (Green)

c) Dual LIU LEDs

1	=	Circuit 2 Yellow 1
2	=	Circuit 2 Yellow 2
3	=	Circuit 2 Red 1
4	=	Circuit 1 Yellow 1
5	=	Circuit 1 Yellow 2
6	=	Circuit 1 Red 1

14.2 System Controller fitted with DT982 firmware

The following table shows changes and additions to fault responses:

No.	FAULT	S			INDICATORS									M A 1 S N N						N O T E	
		P	S	Y	1	2	3	4	5	6	7	8	9	F	F	I	6	I	T		T
	SYSTEM GROUP																				
51	D/board Fail	*	*	*								*									5
52	Rem Loop Set P1		*			*															12
53	Rem Loop Set P2		*				*														12
54	Rem Loop Set P3		*					*													12
55	Rem Loop Set P4		*						*												12
8	Self Test fail	*	*	*								*									6
23	Unconfigured	*	*	*								*									5
42	Main Fault		*	*								*									10
43	Standby Fault		*	*								*									10
49	Main removed		*	*								*									10
50	Standby removed		*	*								*									10
56	Offline Unconf		*	*								*									10
	MANAG GROUP																				
15	Unconfigured	*	*	*								*									5
32	Offline Unconf	*	*	*								*									10
	CIRCUIT GROUP																				
6	Rem Local Loop		*			*	*	*	*												12
7	Rem Loop Ack		*			*	*	*	*												12
	STREAM																				
1-60	T2G Net Fault		*			*	*														12

14.2.1 D/board Fail

This indicates that the System Controller has detected a failure in the communication process or sanity check between the System Controller and the DSP daughter board, indicating a daughter board failure.

14.2.2 Rem Loop Set P1(2)(3)(4)

This indicates a Local Remote Loop command is being output in a timeslot or timeslots originating from the port specified in the fault report.

14.2.3 Rem Local Loop

This indicates that a Network Remote Loop has been locally applied to the circuit specified in the fault report.

14.4 Transmic 2G Fault Framing

For the type of tributary cards listed, and where the alarm or Alarm 1(2) is raised by the channel card, the Transmic 2G frame reports faults towards the Network as follows.

Type of Access	Fault		
	LOS	LOF	AIS
64 kbit/s G.703	c10=0	c10=0	c10=0
2Mbit/s G.703/G.704	c=1	c=1	c=1
X.24/V.11	c10=0		

LOS = Loss of signal

LOF = Loss of Frame

AIS = All ones

c10=1 Normally

c=1=AIS(c)

Notes:

- 1) Low error rates or CRC-4 errors that do not meet the criteria for Service loss are not reported as a fault in the Transmic 2G frame.
- 2) All faults are reported to Transmic 2G frame within 5 seconds, and it is possible to generate c10=0 with loop request framing.

Appendix A

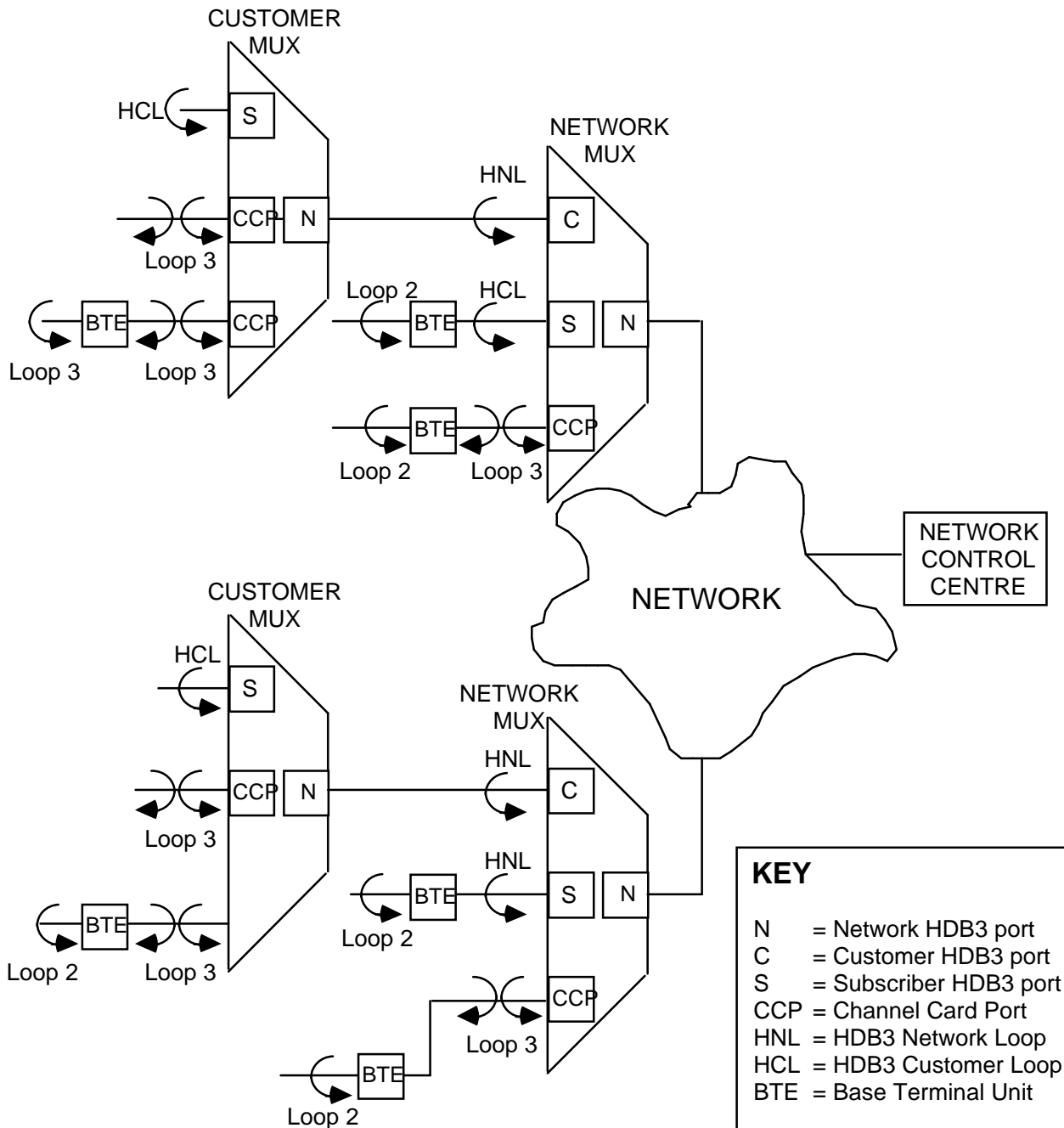


Figure 1-1 Transmic 2G Block Diagram