Teldat Router

BRI ISDN Interface

Doc. *DM729-I* Rev. *10.00*
*December, 2002*

INDEX

Chapter 1
Configuration

1. Introduction

The **Teldat Routers** BRI ISDN interface permit you to manage an ISDN basic interface which includes a D channel and two B channels. Channel D is generally used to send signaling messages for call establishment and release. The B channels are used for data transmission of other protocols. The Teldat routers support switched or permanent ISDN and adapt to the majority of the various existing ISDN standards. Additionally you can configure a series of parameters to determine the behavior of the interface so enabling these routers to be used in almost any scenario or place worldwide.

The BRI ISDN interface assures access to ISDN for data transmission over B channels, supporting various protocols in these. This interface can be viewed as an intermediate between the ISDN and other user interfaces requesting these services. The system's internal architecture is shown in the following figure:
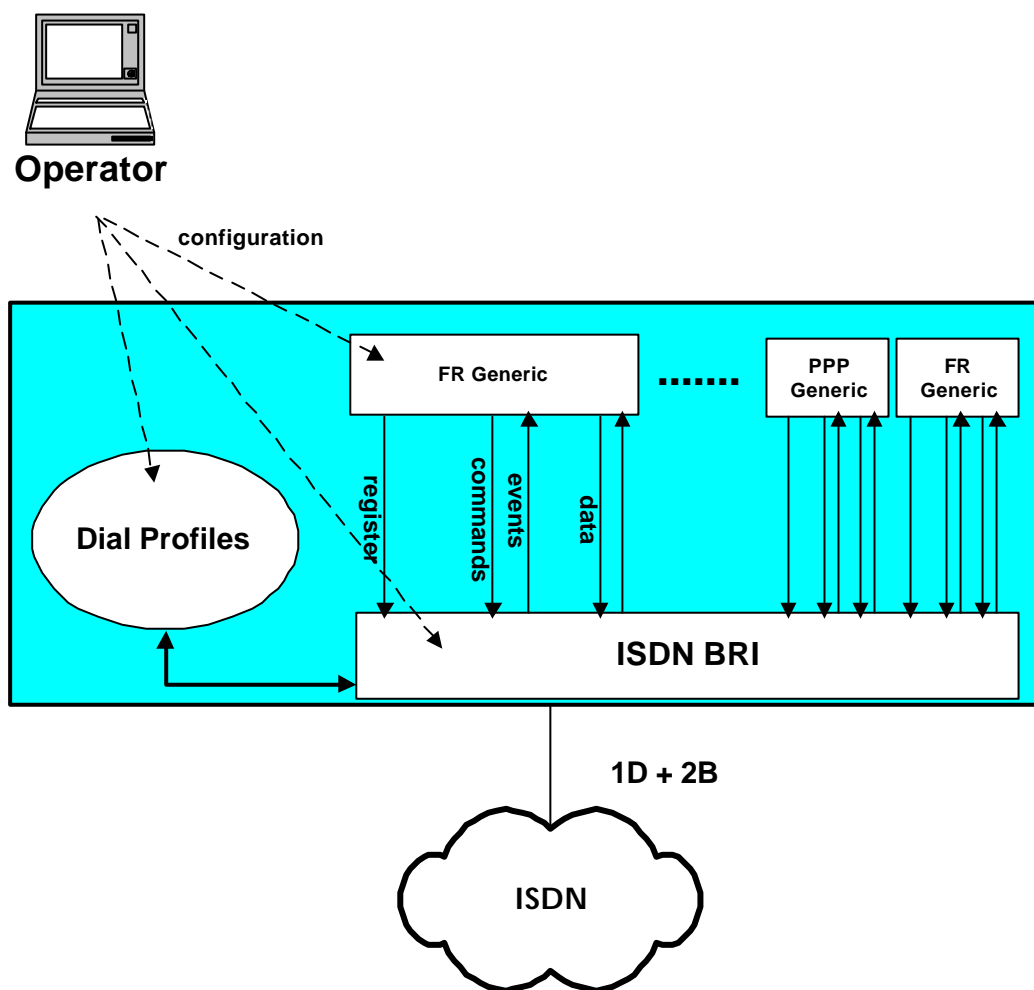
You can configure as many user interfaces as required (FR Generic or PPP Generic) over the BRI ISDN interface. On startup, each user interface is registered over the BRI ISDN base interface. In the register information the BRI ISDN is informed which channel B is required and a dial profile name is provided. The BRI ISDN uses this profile when executing outgoing calls made by the user interface and also to filter the incoming calls consequently being able to assign these to the corresponding interface.

When a user interface wishes to establish a link, it prompts the BRI ISDN base interface through an internal command. The BRI ISDN on having a link available (e.g. when a call has been established) informs the user interface through the corresponding event. Once the link has been established, data exchange can commence.

Logically, if various user interfaces, be they FR Generic or PPP Generic, compete for the same B channel, the BRI ISDN interface assigns the link to the first user requesting it with the other user having to wait until this resource is free.

When operating with an ISDN where the two B channels are permanent, call establishment is not required and nor does the user interface request link activation through a command. This is automatically produced when registering. Consequently only two user interfaces can achieve link activation.

In the sections following this introduction you will find the details for configuring the BRI ISDN. However, an operator who wishes to configure a Teldat router in order to manage Frame Relay or PPP links over ISDN must also be able to handle both dial profile configuration and FR Generic and PPP Generic user interface configuration.

2. BRI ISDN Configuration Commands

The BRI ISDN interface configuration commands are described in this section. Among other things, these commands permit interface behavior to adapt to the Network to which it is connected. It is possible for example to select the ISDN standard.

The available commands are summarized in the below table:

Command	Function
? (HELP)	Permits you to view the commands or available options within a command.
JOIN B1+B2	Associates the two B channels so they form a single pipeline at 128 Kbps.
LEAVE B1+B2	Separates the two B channels that were previously associated through the JOIN BI+B2 command.
LIST	Displays the interface configuration information.
SET	Permits you to configure the value of the distinct interface parameters depending on the required option.
EXIT	Returns to the *Config>* configuration prompt.

Accessing the BRI ISDN Configuration environment

All the configuration commands must be entered at the BRI ISDN interface configuration prompt (BRI config>). In order to access this prompt:

1. Within the configuration prompt (Config>), display the list of interfaces and their associated interface number through the **LIST DEVICES** command.
2. Enter the **NETWORK** command followed by the interface name.

Example:

```
Config>LIST DEVICES

Interface       Con     Type of interface         CSR       CSR2   int
 ethernet0/0    LAN1    Fast Ethernet interface   fa200e00          27
 serial0/0      WAN1    X25                       fa200a00 fa203c00  5e
 serial0/1      WAN2    X25                       fa200a20 fa203d00  5d
 serial0/2      WAN3    X25                       fa200a60 fa203f00  5b
 bri0/0         ISDN1   ISDN Basic Rate Int       fa200a40 fa203e00  5c
 x25-node       ---     Router->Node                     0          0
 ppp1           ---     Generic PPP                      0          0
Config>NETWORK BRI0/0

-- BRI ISDN Configuration --
BRI config>
```

2.1. ? (HELP)

You can use the **?** (HELP) command to list all the valid commands at the level where the router is configured. This command can also be used after a specific command to list the available options.

Syntax:

```
BRI config>?
```

Example:

```
BRI config>?
JOIN B1+B2         Associates B channels in a single pipeline at 128 Kbps
LEAVE B1+B2        Separates B channels that were previously associated
LIST               Displays the interface configuration information
SET                Configures interface parameters
EXIT
BRI config>
```

2.2. <u>JOIN B1+B2</u>

This command associates the two B channels so they form a single pipeline at 128 Kbps. So that this feature is fully operational, the Network must be able to support it.

When the B1 and B2 are grouped, and over either of the two channels a user interface is registered (Generic FR or Generic PPP), really the interface being assigned to the group of channels making up the group. Consequently the user interface has an available bandwidth of 128 Kbps. Additionally, while the two channels are grouped, only one user interface can be registered over them.

> ***IMPORTANT: The association of B channels is only possible when the ISDN Network providing service to the router supports this. In addition the two channels must be configured as permanent.***

Syntax:

```
BRI config>JOIN B1+B2
```

Example:

```
BRI config>JOIN B1+B2
BRI config>
```

2.3. <u>LEAVE-GROUP</u>

This separates the two B channels previously associated through the JOIN B1+B2 command. I.e. after executing this command, you once more have two B channels at 64 Kbps that are individually managed.

Syntax:

```
BRI config>LEAVE B1+B2
```

Example:

```
BRI config>LEAVE-GROUP
BRI config>
```

2.4. <u>LIST</u>

The **LIST** command permits you to view the interface configuration. The configuration of the interface's general parameters appears together with the configuration of each independent channel.

Syntax:

```
BRI config>LIST
```

Example:

```
BRI config>LIST

ISDN Standard           : EURO-ISDN
Type of number          : Unknown
Numbering Plan Identific : Unknown
Sending Complete        : Enabled
Alerting incoming calls : Disabled
Calling number presentat : Allowed
TEI Negotiation option  : First Call
Local address           :
SPID Value for B1        :
SPID Value for B2        :
Maximum frame length     : 2048


            B1    B2
---------- ----  ----
MTU        2048  2048
Type       SW    PERM
B1+B2

BRI config>
```

2.5. <u>SET</u>

The **SET** command permits you to configure the distinct parameters, both global (complete interface) and those for a determined circuit.

Syntax:

```
BRI config>SET <option, parameter, value>
```

> *NOTE: If you do not introduce all the necessary parameters in the commands line, the device will prompt you for them one by one.*

Example:

```
BRI config>SET ?
CIRCUIT      Configures the own parameters for each circuit
GLOBAL       Configures the interface global parameters
```

a) <u>SET CIRCUIT</u>

Permits you to configure the own parameters for each circuit.

Syntax:

```
BRI config>SET CIRCUIT ?
MAX-FRAME-LENGTH      Configures the maximum frame length over each channel
SPID                  Configures SPID for NI-1, DMS100 & ATT5ESS standards
TYPE                  Configures the connection type over each channel
```

· *SET CIRCUIT MAX-FRAME-LENGTH*

Through this parameter, you can configure the maximum frame length permitted in the specified channel. The possible values are 1024, 2048 and 4096 bytes. Default value is 2048 bytes.

Syntax:

```
BRI config>SET CIRCUIT MAX-FRAME-LENGTH <circuit_number, maximum_frame_length>
```

Example:

```
BRI config>SET CIRCUIT MAX-FRAME-LENGTH
Enter circuit (1-2)[1]? 2
Maximum frame length (1024,2048,4096)[2048]? 4096
BRI config>
```

> *NOTE: The maximum frame length associated to a channel cannot exceed the value of that configured for the interface in its group.*

· SET CIRCUIT TYPE

Configures the connection type established over each channel: permanent or switched.

Syntax:

```
BRI config>SET CIRCUIT TYPE <circuit_type, circuit_number>
```

The two possible options are permanent (PERMANENT) or switched (SWITCHED).

```
BRI config>SET CIRCUIT TYPE ?
PERMANENT       Permanent connection type (Not Q.931 signalling)
SWITCHED        Switched connection type
```

Example:

```
BRI config>SET CIRCUIT TYPE SWITCHED
Enter circuit (1-2)[1]?
BRI config>
```

or

```
BRI config>SET CIRCUIT TYPE PERMANENT
Enter circuit (1-2)[1]?
BRI config>
```

· SET CIRCUIT SPID

This command permits you to configure the SPID (Service Profile ID). SPIDs are used in the American standards (NI-1, NI-2, DMS100, ATT 5ESS) to identify which services are provided for a determined terminal. In cases where one of these standards has been selected in the router, you need to configure a SPID for each B channel. The SPID usually takes the same format as the telephone number, but with extensions before or after. E.g. A SPID can be the telephone number itself, terminating in 0100 or 0010.

On being connected to the line, provided the device has a SPID configured, level 2 initialization is carried out (obtained from TE1) and subsequently the initialization of the SPID. The router cannot make or receive any calls until the SPID has initialized correctly. I.e. it cannot carry out frame exchange at level 3.

Some network implementations support the use of automatic SPID. In this case, the device can be configured in channel 1 with the Universal SPID (01010101010101), so that after level 2 initialization this sends an INFO message with null call reference and with the said SPID. When the Network receives this petition it returns (in INFO messages with null call reference) the various SPID values supported, their corresponding values (DN) and the available capacities (Bearer Capabilities). This process ends when the Network sends another message to the terminal requesting more information (IRQ "prompt for additional information, terminal identification). From this point and depending on the received values, the terminal carries out initialization in an identical form to the manual mode.

> *ATTENTION: You only need to configure the SPID if the device is going to connect to a standard network NI-1, NI-2, DMS100 or ATT 5ESS.*

Syntax:

```
BRI config>SET CIRCUIT SPID <circuit_number, SPID>
```

Example:

```
BRI config>SET CIRCUIT SPID
Enter circuit (1-2)[1]? 2
Service Profile IDentifier (SPID)[]? 9876543210100
BRI config>
```

b) SET GLOBAL

Configures the interface global parameters.

Syntax:

```
BRI config>SET GLOBAL ?
ALERTING              Respond to SETUP messages with an ALERTING message
LOCAL-ADDRESS         Configures the local number for the interface
MAX-FRAME-LENGTH      Configures the maximum frame length supported
NUMBER_TYPE           Configures the number type field used in outgoing calls
PLAN-TYPE             Configures the plan type field used in outgoing calls
PRESENTATION          Configures the presentation indicator in outgoing calls
SENDING-COMPLETE      Enable or disable sending complete IE in outgoing calls
STANDARD              Configures the ISDN standard
TEI-NEGOTIATION       Configures TEI negotiation option
```

· SET GLOBAL ALERTING

When this option is enabled, the devices respond to the Q.931 SETUP messages coming from the Network with an ALERTING message. Consequently this only affects incoming calls. This option is disabled by default.

Syntax:

```
BRI config>SET GLOBAL ALERTING ?
DISABLE     Does not send ALERTING to SETUP incoming
ENABLE      Sends ALERTING to SETUP incoming
```

Example:

```
BRI config>SET GLOBAL ALERTING ENABLE
BRI config>
```

or

```
BRI config>SET GLOBAL ALERTING DISABLE
BRI config>
```

· SET GLOBAL LOCAL-ADDRESS

Permits you to configure the local number for the interface. This number is used as the calling number in those outgoing calls executed by the user interfaces (Generic FR or Generic PPP) whose dial profile does not have the local number configured. When the profile does have the local number configured, this is used as the calling number.

> *NOTE: Although it is not mandatory to configure this parameter, it is advisable to so do in cases where an interface can execute outgoing calls and its associated profile does not have the local number configured.*

Syntax:

```
BRI config>SET GLOBAL LOCAL-ADDRESS <ISDN_number>
```

Example:

```
BRI config>SET GLOBAL LOCAL-ADDRESS
Local address []? 913141592
BRI config>
```

· SET GLOBAL MAX-FRAME-LENGTH

Through this parameter, you configure the maximum frame length supported by the interface. Permitted values are 1024, 2048 and 4096 bytes. Default value is 2048 bytes.

Syntax:

```
BRI config>SET GLOBAL MAX-FRAME-LENGTH <maximum_frame_length>
```

Example:

```
BRI config>SET GLOBAL MAX-FRAME-LENGTH
Maximum frame length (1024,2048,4096)[2048]?
BRI config>
```

· SET GLOBAL NUMBER-TYPE

Permits you to configure the "number type" field encoded in the information elements "calling number" and "called number" used by the router in outgoing calls. The default value is UNKNOWN.

Syntax:

```
BRI config>SET GLOBAL NUMBER-TYPE <number_type>
```

```
BRI config>SET GLOBAL NUMBER-TYPE ?
UNKNOWN
INTERNATIONAL
NATIONAL
SPECIFIC
SUBSCRIBER
ABBREVIATED
```

Example:

```
BRI config>SET GLOBAL NUMBER-TYPE NATIONAL
BRI config>
```

· SET GLOBAL PLAN-TYPE

Permits you to configure the "plan type" field encoded in the information elements "calling number" and "called number" used by the router in outgoing calls. The default value is UNKNOWN.

Syntax:

```
BRI config>SET GLOBAL PLAN-TYPE <plan_type>
```

```
BRI config>SET GLOBAL PLAN-TYPE ?
UNKNOWN
ISDN-TELEPHONY
DATA
TELEX
NATIONAL
PRIVATE
```

Example:

```
BRI config>SET GLOBAL PLAN-TYPE ISDN-TELEPHONY
BRI config>
```

· *SET GLOBAL PRESENTATION*

Permits you to configure the "presentation indicator" field encoded in the information elements "calling number" and "called number" used by the router in outgoing calls. The default value is ALLOWED.

Syntax:

```
BRI config>SET GLOBAL PRESENTATION <presentation_indicator>
```

```
BRI config>SET GLOBAL PRESENTATION ?
ALLOWED        presentation indicator allowed in outgoing calls
RESTRICTED     presentation indicator restricted in outgoing calls
```

Example:

```
BRI config>SET GLOBAL PRESENTATION RESTRICTED
BRI config>
```

· *SET GLOBAL SENDING-COMPLETE*

When this option is enabled, the device includes the "sending complete" information element in the outgoing calls' Q.931 SETUP messages. This option is enabled by default.

> *WARNING: The Teldat routers do not support overlap sending, independently of whether the "sending complete" information element is included or not.*

Syntax:

```
BRI config>SET GLOBAL SENDING-COMPLETE <ENABLE or DISABLE>
```

```
BRI config>SET GLOBAL SENDING-COMPLETE ?
DISABLE     Does not Include sending complete IE in outgoing calls
ENABLE      Includes sending complete IE in outgoing calls
```

Example:

```
BRI config>SET GLOBAL SENDING-COMPLETE ENABLE
BRI config>
```

or

```
BRI config>SET GLOBAL SENDING-COMPLETE DISABLE
BRI config>
```

· *SET GLOBAL STANDARD*

Permits you to configure the standard used in ISDN. The default standard used is EURO-ISDN.

Syntax:

```
BRI config>SET GLOBAL STANDARD <standard>
```

```
BRI config>SET GLOBAL STANDARD ?
ATT5ESS          AT&T 5ESS signalling
DMS100           Nortel DMS100 signalling
EURO-ISDN        European ISDN standard (Q.931)
NI-1             American National ISDN standard
NTT-Japan        Japan ISDN signalling
```

Standard	Application
EURO-ISDN	This is valid for the majority of the European countries although there may be some national peculiarities. This standard is also used in many other countries.
NI-1	Valid for NI-1 and NI-2. Used by some USA carriers and by some other countries.
ATT5ESS	Used by some USA carriers and in other countries where the network equipment is implemented with ATT switches.
DMS100	Used by some USA carriers and in other countries where the network equipment is implemented with Nortel switches.
NTT-Japan	Used by NTT (Japan).

Example:

```
BRI config>SET GLOBAL STANDARD NTT-Japan
BRI config>
```

· SET GLOBAL TEI-NEGOTIATION

The device can be configured to begin TEI negotiation on its own initiative as soon as it is connected and powered up. Contrariwise, the TEI negotiation only begins when it's necessary to carry out calls.

> *NOTE: In the first place, so that the TEI negotiation begins, the router forces the physical level activation. Therefore, a device configured to negotiate TEI on startup will permanently have the physical level activated unless the Network subsequently deactivates it.*

Syntax:

```
BRI config>SET GLOBAL TEI-NEGOTIATION <option>
```

```
BRI config>SET GLOBAL TEI-NEGOTIATION ?
FIRST-CALL       TEI negotiation begins at first call
POWER-UP         TEI negotiation begins at statup or physical activation
```

Example:

The TEI negotiation begins when it is necessary to carry out an outgoing call (default option).

```
BRI config>SET GLOBAL TEI-NEGOTIATION FIRST_CALL
BRI config>
```

TEI negotiation begins as soon as the device powers up.

```
BRI config>SET GLOBAL TEI-NEGOTIATION POWER_UP
BRI config>
```

2.6. EXIT

Through the EXIT command, you exit the BRI ISDN interface configuration menu and return to the *Config>* configuration prompt.

Syntax:

```
BRI config>EXIT
```

Example:

```
BRI config>EXIT
Config>
```

Chapter 2
Monitoring

1. BRI ISDN interface monitoring

This section summarizes and explains all the BRI ISDN interface monitoring commands. These commands permit you to monitor the interface behavior.

The available monitoring commands are summarized in the below table:

Command	Function
? (HELP)	Permits you to list all the commands or the options available within a command.
ACTIVATE	Activates the physical level and requests the Network for TEI assignation.
CALLS	Displays the produced calls.
CAUSE	Returns the meanings of the call release codes.
CLEAR	Permits you to initialize the channels' statistics and clear the released calls buffer.
DISABLE	Permits you to disable either of the two B channels.
ENABLE	Enables a B channel that was previously disabled through the **DISABLE** command.
ESTABLISH Call	Carries out an outgoing call.
LOOPBACK	Permits you to enable or disable the digital loop in the ISDN S interface.
RELEASE Call	Releases a previously established call.
STATISTICS	Displays the statistics of an active B channel.
EXIT	Returns to the global monitoring prompt (+).

Accessing the BRI ISDN monitoring environment

All the BRI ISDN interface monitoring commands must be entered at the monitoring prompt *BRI >*. In order to access this prompt, carry out the following steps:

1. Within the monitoring prompt (+), display the list of interfaces and their associated interface number through the **DEVICE** command.
2. Enter the **NETWORK** command followed by the interface name.

Example:

```
+DEVICE

                               Auto-test   Auto-test    Maintenance
Interface          CSR    Vect    valids    failures      failures
ethernet0/0    fa200e00     27       1          0             0
serial0/0      fa200a00     5E       0         619            0
serial0/1      fa200a20     5D       0         619            0
serial0/2      fa200a60     5B       0         619            0
bri0/0         fa200a40     5C       1          0             0
x25-node          0          0       1          0             0
ppp1              0          0       0         249            0
+NETWORK BRI0/0

-- BRI ISDN Console --

BRI>
```

1.1. ? (HELP)

The **?** (HELP) command permits you to view all the valid commands at the level where the interface is being monitored. This command can also be used after a specific command to list the available options.

Syntax:

```
BRI>?
```

Example:

```
BRI>?
ACTIVATE
CALLS
CAUSE
CLEAR
DISABLE
ENABLE
ESTABLISH Call
LOOPBACK
RELEASE Call
STATISTICS
EXIT
BRI>
```

1.2. ACTIVATE

Executing this command provokes physical level activation. Once the physical level has been activated, the device requests the Network for TEI assignment.

Syntax:

```
BRI>ACTIVATE
```

Example:

```
BRI>ACTIVATE

 ISAC status: F7 Activ
Tx Bytes:               11  Rx Bytes:               11
Tx underrun:             0  Rx overflow:             0
D collitions:            0

 Lapd Status    : llid 4 - S7 - Active Line. Multiple frame established
                 TEI assigned = 64
BRI>
```

The meaning of the various fields is as follows:

ISAC status	Indicates the level 1 status where the interface is located.
Tx Bytes	Bytes transmitted by the device in channel D.
Rx Bytes	Bytes received in channel D (transmitted by the Network).
Tx underrun	Frames aborted in transmission due to an underrun in the transmission FIFO queue.
Rx overflow	Frames lost due to an overflow in the reception FIFO queue.
D collitions	Frames transmitted with collisions in channel D.
Lapd Status	Indicates the level 2 status (LAPD) where the interface is located.
TEI assigned	Indicates the TEI that has been assigned by the Network.

1.3. CALLS

Information on the calls is displayed through the **CALLS** command.

> ACTIVE: displays the active calls data.
>
> CLEARED: displays the released calls information.

Syntax:

```
BRI>CALLS <call_type>
```

```
BRI>CALLS ?
ACTIVE
CLEARED
```

a) CALLS ACTIVE

Example:

```
BRI>CALLS ACTIVE

TYPE  CALLED NUMBER    CALLING NUMBER REF  CHAN   T/START    D/START     CHARGE
OUT           384200                 001  1-B1   17:11:47  01/20/00     000000

BRI>
```

The meaning of the various fields is as follows:

TYPE	Incoming (IN) or outgoing (OUT).
CALLED NUMBER	Called terminal number.
CALLING NUMBER	Calling terminal number.
REF	Call reference value in use.
CHAN	Line and channel through which the call has been established.
T/START	Indicates the call start time.
D/START	Indicates the day the call was established.
CHARGE	Actual call cost (should the network provide this).

b) CALLS CLEARED

Example:

```
BRI>CALLS CLEARED


L T    CALLED N.  CALLING N. CC  DC  T/START    T/END  D/START    D/END CHARGE
1 O      384200              016 000 16:48:05 17:10:57 01/20/00 01/20/00 000000

BRI>
```

In this case, the meaning of the fields is as follows:

L T	Line Identifier and channel Type.
CALLED N.	Called terminal number.
CALLING N.	Calling terminal number.
CC	Call release code (cause).

DC	Diagnostic code.
T/START	Call start time.
T/END	Call release time.
D/START	Day call is established.
D/END	Day call is released.
CHARGE	Call charge (should the network provide this).

> *NOTE: In cases of permanent links, calls are not generated as the links are perpetually established.*

1.4. CAUSE

The **CAUSE** command returns the meaning of a determined release code. This command is for information purposes in order to comprehend the data presented.

Syntax:

```
BRI>CAUSE <cause_code>
```

Example:

```
BRI>CAUSE 3
Cause (3):  No route to the destination

BRI>
```

1.5. CLEAR

The **CLEAR** command permits you to delete the B and D channels statistics. You can also clear the released calls buffer.

Syntax:

```
BRI>CLEAR <option>
```

```
BRI>CLEAR ?
CALLS
STATISTICS
```

a) CLEAR CALLS

Clears the released calls buffer.

Example:

```
BRI>CLEAR CALLS
BRI>
```

b) CLEAR STATISTICS

Deletes the statistics for the B and D channels.

Syntax:

```
BRI>CLEAR STATISTICS
```

Example:

```
BRI>CLEAR STATISTICS
BRI>
```

1.6. <u>DISABLE</u>

This command permits you to disable a B channel. Once disabled, you cannot receive or transmit frames through this B channel.

When a B channel is disabled, you can still establish and release calls. For example, if a Generic FR or Generic PPP user interface requests the BRI ISDN interface to establish a call and the Network assigns a channel B, B1 for example, and this B channel is disabled, the call will be established in the normal way and the user interface will believe that frames can be transmitted and received. However, all frames that are transmitted will be discarded in the BRI ISDN interface which will in turn ignore all frames received from the remote end.

> *WARNING: Great care must be taken when using the DISABLE command as if a B channel is inadvertently left disabled, the router behavior could give rise to the belief that there is a fault on the Network or that the device is faulty.*

Syntax:

```
BRI>DISABLE <channel>
```

Example:

```
BRI>DISABLE 1
 Circuit B1 disabled
BRI>
```

To disable the B1 channel.

```
BRI>DISABLE 2
 Circuit B2 disabled
BRI>
```

To disable the B2 channel.

1.7. <u>ENABLE</u>

Through this command, you can enable a B channel previously disabled through the DISABLE command. Once enabled, you can once more transmit and received frames through the said B channel.

Syntax:

```
BRI>ENABLE <channel>
```

Example:

```
BRI>ENABLE 1
 Circuit B1 enabled
BRI>
```

To enable the B1 channel.

```
BRI>ENABLE 2
 Circuit B2 enabled
BRI>
```

To enable the B2 channel.

1.8. <u>ESTABLISH Call</u>

Through this command you can carry out outgoing calls. This may, for example, be useful for making test calls and for ensuring that the basic access which the router is connected to is operating correctly.

In order to make an outgoing call, a Generic FR or Generic PPP user interface and its associated dial profile must be correctly configured. On executing this command you will be prompted as a parameter for the number identifying the user interface. The call will then establish in the same way as if this had been requested from the user interface itself. Therefore this command can also be useful in order to force a user interface to activate and to check that it is running correctly.

Once a call has been established, the behavior will be as per usual. E.g. if the profile used for the call has a release time of 30 seconds due to absence of data, the call will be released as soon as this time period without data has timed out. In the same way, the rest of the profile parameters that may affect the call are respected.

> *NOTE: If the dial profile being used does not permit outgoing calls, it will not be possible to force an outgoing call through the ESTABLISH Call command.*

Syntax:

```
BRI>ESTABLISH <user_ifc_number>
```

Example:

```
BRI>ESTABLISH 6
BRI>
```

Assuming that the interface number 6 is a correctly configured Generic FR or Generic PPP which behaves as a BRI ISDN user.

1.9. <u>LOOPBACK</u>

This command permits you to activate a digital loop in the ISDN interface. The digital loop is needed to execute determined authorization tests over some ISDN standards. These tests are usually carried out in certified laboratories and are always supervised by qualified staff from Teldat S.A.

> *NOTE: You should never activate a digital loop when the device is in normal operating mode even if the ISDN interface stops behaving correctly.*

Syntax:

```
BRI config>LOOPBACK <ENABLE or DISABLE>
```

```
BRI config>LOOPBACK ?
ENABLE
DISABLE
```

Example:

```
BRI config>LOOPBACK ENABLE
Loopback activated
BRI config>
```

or

```
BRI config>LOOPBACK DISABLE
Loopback deactivated
BRI config>
```

1.10. <u>RELEASE Call</u>

Through this command you can release any call established in the BRI ISDN interface. It makes no difference whether the call you wish to release has been executed in a Generic FR or Generic PPP through own initiative or whether it has been forced through the ESTABLISH Call command. In either of the two cases, the call will be released.

> *NOTE: When a call has been released, the user interface can re-establish it as son as required (when there is outgoing traffic for example).*

On executing this command, the number identifying the user interface responsible for the call in progress will be requested as a parameter. In this way, the call will be released in exactly the same way as if it were released by user interface initiative.

Syntax:

```
BRI>RELEASE <número_ifc_usuario>
```

Example:

```
BRI>RELEASE 6
BRI>
```

Assuming that the interface number 6 is a correctly configured Generic FR or Generic PPP which behaves as a BRI ISDN user.

1.11. <u>STATISTICS</u>

The **STATISTICS** command displays the statistics for the frames received and transmitted through the B channels and also through the D channel.

Syntax:

```
BRI>STATISTICS
```

Example:

```
BRI>STATISTICS

Circuit    Pkts Rx     Bytes Rx      Pkts Tx     Bytes Tx
B1            112         5612          111         3552
B2              0            0            0            0


            Statistics circuit B1

 Lost Rx Frames            0    Non aligned Rx frames       0
 Too large frames          0    Aborted Rx sequences        0
 CRC error Rx frames       0    Incomplete Rx frames        0
 Rx fifo failure           0    Tx fifo failure             0

            Statistics circuit B2

 Lost Rx Frames            0    Non aligned Rx frames       0
 Too large frames          0    Aborted Rx sequences        0
 CRC error Rx frames       0    Incomplete Rx frames        0
 Rx fifo failure           0    Tx fifo failure             0

            Statistics D-Channel

LAPD llid 4 stats
```

```
I Frames   : transmitted  =         2    received  =         3
RR Frames  : transmitted  =       523    received  =       522
RNR Frames : transmitted  =         0    received  =         0
REJ Frames : transmitted  =         0    received  =         0
FRMR Frames: transmitted  =         0    received  =         0
UI Frames  : transmitted  =         0    received  =         0
Errors in N(S):         0

BRI>
```

The meaning of the fields is as follows:

Pkts Rx	Packets received in the B channel.
Bytes Rx	Bytes received in the B channel.
Pkts Tx	Packets transmitted in the B channel.
Bytes Tx	Bytes transmitted in the B channel.
Lost Rx Frames	Frames lost at reception.
Too large frames	Received frames that exceed the MTU maximum length.
CRC error Rx frames	Received frames with error in the Cyclic Redundancy Code.
Rx fifo failure	Failures due to overflows in the reception FIFO queue.
Non aligned Rx frames	Received frames non-aligned to octet.
Aborted Rx sequences	Aborted frames received.
Incomplete Rx frames	Incomplete frames received.
Tx fifo failure	Frames aborted in transmission due to underrun in the transmission FIFO queue.
I Frames	I frames transmitted or received through the D channel.
RR Frames	RR frames transmitted or received through the D channel.
RNR Frames	RNR frames transmitted or received through the D channel.
REJ Frames	REJ frames transmitted or received through the D channel.
FRMR Frames	FRMR frames transmitted or received through the D channel.
UI Frames	UI frames transmitted or received through the D channel.
Errors in N(S)	Received frames with error in the sequence number.

1.12. EXIT

Use the **EXIT** command to return to the global monitoring prompt (+).

Syntax:

```
BRI>EXIT
```

Example:

```
BRI>EXIT
+
```

2. Other BRI ISDN interface statistics

In order to view the summarized information on the state and the statistics of the BRI ISDN interface, enter the command **DEVICE** at the monitoring prompt (+) subsequently indicating the number of the BRI ISDN interface.

Example:

```
+DEVICE

                              Auto-test   Auto-test    Maintenance
Interface        CSR    Vect     valids    failures       failures
ethernet0/0    fa200e00   27          1           0              0
serial0/0      fa200a00   5E          0          10              0
serial0/1      fa200a20   5D          0          10              0
serial0/2      fa200a60   5B          0          10              0
bri0/0         fa200a40   5C          1           0              0
x25-node              0    0          1           0              0
atm3/0         f0000000   22          0           5              0

+DEVICE BRI0/0

                              Auto-test   Auto-test    Maintenance
Interface         CSR   Vect     valids    failures       failures
bri0/0         fa200a40   5C          1           0              0

 ISAC status: F3 Pdwn
Tx Bytes:            0  Rx Bytes:           0
Tx underrun:         0  Rx overflow:        0
D collitions:        0

 Lapd Status    : llid 4 - S1 - TEI unassigned

Q931 Status:  ID 0: U0
Q931 Status:  ID 1: U0


+
```

The meaning of the fields is as follows:

Interface	Type of interface and index.
CSR	Control/status/data registers address.
Vect	Interruption vector associated to the interface.
Auto-test valids	Number of successful Auto-tests. This does not update in cases concerning the BRI ISDN interface.
Auto-test failures	Number of failed Auto-tests. This does not update in cases concerning the BRI ISDN interface.
Maintenance failures	Number of maintenance failures. This does not update in cases concerning the BRI ISDN interface.

The remaining parameters provide you with information on the level 1 (I.430), 2 (LAPD) and 3 (Q.931) states. This is further explained in previous sections contained in this manual.