Teldat Router

Voice over IP

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INDEX

Chapter 1
Introduction

1. Introduction to the H.323 Configuration

1.1. Voice encoding

The VoIP board permits you to transmit voice and fax via a network such as Internet. There exist two types of Voxnet boards, one for the basic telephone network and the second for ISDN. The PSTN board can connect to telephones, switchboards, fax and traditional telephone lines while the ISDN telephone board connects to ISDN switchboards acting as a Network Terminator (NT). The device itself detects the type of board it is connected to and sets the appropriate parameters for each type of board by default if there is no existing configuration.

The voice signals introduced into these boards are in digital format if the board is ISDN (encoded according to G.711 law A) and in analog if the board is a traditional telephone one, in these cases it is the board itself that carries out the Analog-Digital (A/D) and Digital-Analog (D/A) conversion. The digital signals are processed and treated by a Digital Signal Processor (DSP) which carry out the following functions:

Compression: In order to reduce the bandwidth, the digital signal undergoes a compression process according to various norms (codecs). In the case of the VoxNet board this is either G.729 or G.723.1.

The two codecs provide a trade-off between quality and bit rate. The best quality is obtained with G.729 which works at 8 Kbps. G.723.1 can work at 6.4 and 5.3 Kbps and provides a slightly lower voice quality than G.729.

Packaging: Once the voice is compressed, it is sent in sequential order and fixed frame length to the main CPU. Depending on the norm used the packet length and cadence is:

G.729: 10 octets every 10 milliseconds.

G.723.1 a 6,4 Kbps: 24 octets every 30 milliseconds.

G.723.1 a 5,3 Kbps: 20 octets every 30 milliseconds.

The main CPU subsequently transports the voice frame over the IP stack. Each datagram can be configured to contain one or more voice frame. If more than one voice frame is encapsulated in one IP packet, the bandwidth required for that voice flow is lower as the RTP/UDP/IP headers are shared between some voice frames. The bandwidth savings are negligible if you are using header compression algorithms such as CRTP.

In order to achieve reasonable voice quality, these packets should be delivered at their destination in the same order and cadence as generated at source.

In order to minimize possible loss of some voice examples, the compression algorithms use interpolation techniques in order to regenerate any losses.

In the same way and given that propagation time for a datagram over the network is not fixed (the opposite to a switched circuit network), the packets are stored in a small buffer and subsequently delivered in the same order, as far as possible, as they were generated (every 10 or 30 milliseconds depending on the codec used). This does produce a certain delay in voice which is tolerable within limits but also permits compensation of the delays introduced by the network and the jitter (delay variation).

1.2. H.323 Recommendation

In order to transport this multimedia information in real time over the packet switch networks, the ITU-T has defined a series of norms found in the H.323 Recommendation.

The H.323 Recommendation also describes another series of elements as well as terminals such as gateways and gatekeepers.

The gateways permits the interconnection of the H.323 systems with other conference systems such as ISDN, analog telephones (Plain Old Telephone Service -POTS-) etc. The gatekeepers proportion admission mechanisms and address translations between the different terminals.

The H.323 Recommendation makes references to other norms such as:

- H.225.0: Describes the means by which audio, video, data and control are associated, encoded, and packaged for transport between the H.323 terminals in a network which does not have quality of service guaranteed, and between H.323 terminals and H.323 gateways. H.225.0 specifies the protocols and the message format used in RTP (Real Time Protocol), RTCP (Real Time Control Protocol), Q931 and RAS (Register Admission Status).

- Q.931: This uses a connection establishment procedure derived from this norm in a similar way to ISDN. The Q.931 messages are encapsulated in TCP/IP sessions.

- RTP: Carries out framing functions, sequence numeration, timestamp, payload type and source identification.

- RTCP: This is associated to RTP and gives information on the communication status and features.

- H.245: This defines the capacity exchange procedures, channel negotiation and flow control.

Chapter 2
Configuration

1. Configuration commands

The H.323 Protocol configuration is accessed through the main menu in the following way:

1. At the (*) prompt, enter PROCESS 4 (or P 4).
2. At the configuration (Config>) prompt, enter PROTOCOL H323 or PROTOCOL 4 or P 4.
3. At the H.323 protocol configuration (H323 Config>) prompt, use the configuration commands described in this chapter to configure the configuration parameters.

In this chapter the H.323 configuration commands are explained in detail. All the H.323 configuration commands should be introduced from the H.323 prompt (H323 Config>). The letters written in **bold** indicate the minimum number of characters which must be entered in order to make the command operative.

Command	Functions
? (HELP)	Lists all the available commands or options.
ADD	Adds an additional element to a table such as assigning a new number to a line, a new prefix or a new number to an IP address.
APPLY	Dynamically activates some of the newly configured values.
DELETE	Deletes an element from a table.
DISABLE	Disables the distinct elements such as the voice activity detection, the reception of calls on line etc.
ENABLE	Enables the distinct elements such as the voice activity detection, the reception of calls on line etc.
LIST	
SET	Displays current configuration.
EXIT	Configures the value of a parameter.
	Return to Config> prompt.

If you wish to delete all of the H323 configuration without losing the rest of the device configuration, you can do this through the CLEAR H323 command from the Config> prompt:

```
Config> CLEAR H323
Config of H323 will be DELETED
Continue clearing? (Yes/No)? y
Config>
```

1.1. ? (HELP)

Displays a list of the available commands or their options.

Syntax:

```
H323 Config> ?
```

Example:

```
H323 Config > ?
ADD
APPLY
DELETE
DISABLE
ENABLE
LIST
SET
EXIT
H323 Config>
```

1.2. ADD

Adds an additional element to a table such as assigning a new number to a line, a new prefix or a new number to an IP address.

Syntax:

```
H323 Config> ADD ?
ADDRESS
CODEC-CLASS
LINE
PREFIX
```

a) ADD ADDRESS

This permits you to aggregate an entry in the telephone number assignment table to IP addresses. This is used to find out how to access a remote telephone number. Once you have selected the entry depending on the called destination number, you apply compressions (digits to strip) and expansions (dial-out prefix) over the remote telephone's E.164 identifier. You can also chose the type of codec, VAD and NOB to be used (grouped through a class of codec) and use a technological prefix (this is only useful in environments controlled by a gatekeeper).

The table order is very important as it is processed in this order. Once you have found an entry that matches, the checking is completed.

Example:

```
H323 Config> ADD ADDRESS
Telephone number? 243
Digits to Strip[0]? 2
Dial-Out Prefix? 0012
IP address: [0.0.0.0]? 10.1.1.2
Codec-class Id[0]?
Tech-prefix[]?
H323 Config>
```

With this example configuration, on calling the number 243, a call is carried out to the address 10.1.1.2 to the telephone number 00123, using the codec VAD and NOB by line default.

Telephone number	Digits through which the IP address is chosen. These can be the complete telephone number or only the first digits in accordance with a given numeration plan.
	The maximum accepted is 15 digits (0 to 9).
Digits to strip	Number of digits of the telephone number received that are eliminated beginning on the left (prefixes).
	Admits values between 0 and 15.
Dial-out prefix	Digits used as prefix number resulting from the application of the previous field delete over the requested telephone number. Admits up to 15 digits (0 to 9).
IP address	This is the IP address the call is made to.
Codec-class	Codec class identifier to be used with this destination. This class defines the codec, use of called VAD and NOB. For further information see ADD CODEC-CLASS command.
	Admits values between 1 and 225.
Tech-Prefix	Technological prefix used on carrying out the call. This field is only logical when the device is controlled by a gatekeeper. If this is not specified, then the default prefix associated with the gateway is used. Admits a maximum character string length of 11. Longer strings are truncated to 11 characters.

Values falling outside of the established margins give rise to an error message and assume the operation terminated. If two entries are included where the IP address and the telephone number are exactly the same, an error message is given. On the other hand, you can aggregate a second entry where the telephone numbers are the same: in this case, the second entry is used as an alternative IP address to access the remote telephone should you not be able to access through the first.

If the devices operates under the control of a gatekeeper (this needs to have the gatekeeper IP address configured), it doesn't make any sense to use these entries as the destination address are obtained from this. However, if you wish to carry out numerical compressions and/or expansions using the codec classes and technological prefixes, you must include entries with the IP address 0.0.0.0.

On receiving calls, these entries are also checked: if the calling IP address corresponds to a configured one, the call is considered direct and does not contact the gatekeeper.

b) *ADD CODEC-CLASS*

Permits you to define a codec class for use depending on the called telephone (see **ADD ADDRESS** command). A codec class is comprised of a type of codec, a VAD configuration (voice activity detector) and a determined NOB (number of voice frames per RTP packet).

Example:

```
H323 Config>ADD CODEC-CLASS
Codec-class Id[0]? 1
Class already defined

H323 Config>ADD CODEC-CLASS
Codec-class Id[0]? 2
Codec (1: G723 5.3Kbps. 2: G723 6.4Kbps, 3:G729A)[1]? 2
Number of H323 Frames/RTP packet [1 - 6]: [1]? 2
VAD (0-> disabled, 1-> Enabled)[1]? 1
H323 Config>
```

```
H323 Config>LIST CODEC-CLASS
Id    Codec        frm/pkt (bytes)  VAD

  1  G723 5.3Kbps      1 ( 20)      E
  4  G729A 8Kbps       3 ( 30)      D
  2  G723 6.4Kbps      2 ( 48)      E

H323 Config>
```

Codec-class	Codec Class identifier to be used. Admits values between 1 and 255.
Codec	Type of codec to use. The existing values appear on requesting the data. Value –1 indicates the codec configured in the line by default is used.
Number of H323 Frames/RTP	NOB. Number of voice packets you wish to send in each RTP frame. When this value is increased, the bandwidth needed to send voice data is diminished, however the delay between them is increased. Admits values between 1 and 6. Value 1 indicates the NOB configured in the line by default is used.
VAD	Use of the automatic voice detector. This can be enabled or disabled. On enabling this, the bandwidth required diminishes therefore RTP packets are only transmitted when there is voice, and not when there are silences. Value –1 indicates that the VAD configured in the line by default is used.

If the list has already been defined, or the class identifier is wrong, an error message appears.

The available codec class list can be viewed through the **LIST CODEC-CLASS** command. You can delete entries through the command **DELETE CODEC-CLASS**.

c) ADD LINE

Aggregates an entry in the lines table. This table is associated with the device's telephone number and physical lines. On receiving a call, the table is searched for the caller number in order to find the corresponding line number. If it is found the call is routed towards this line. Should the line not be found, it's busy or disabled, a free line is looked for in accordance with the configured priorities.

In some cases (when the line type is FXO or the interface is ISDN) the router will dial a number to the PSTN or to a PABX or PBX depending. In these situations, it is useful to be able to dial a different number to the original H323 called number. For that purpose when you assign telephone numbers to a line, you can specify numerical compressions (digits to strip) or expansions (dial-out prefix).

Example:

```
H323 Config> ADD LINE
Line?[1]? 1
Telephone number? 918076610
Digits to Strip[0]? 2
Dial-Out Prefix? 0
H323 Config>
```

Line	This is the line number which a telephone number will be assigned to. Admits values between 1 and the number of lines in the device.
Telephone number	Digits through which a line is selected. This can be the complete telephone number assigned to this line or just the prefix.

	Maximum digits accepted is 15 (0 to 9).
Digits to Strip	Number of digits from the received telephone number that are eliminated from the left (prefixes). Admits values between 0 and 15.
Dial-Out Prefix	Digits used as number prefix resulting from the delete application (strip) indicated in the above field on the received telephone number. Up to 15 digits are admitted (0 to 9).

An error message appears if the given values are not within the configured range or if there is an entry with the same line number and telephone number.

The entries list can be viewed through the **LIST TABLE LINE** command. Entries can be deleted through the **DELETE LINE** command.

d) ADD PREFIX

Permits you to add an entry to the prefix table. These entries define the numeration plan used in a way that, depending on the first digits dialed, the length of the dialed number is decided and indicated when the call process is initiated.

Example:

```
H323 Config> ADD PREFIX
Prefix:? 91
Length:[0]? 9
H323 Config>
```

Prefix	Digits over which the decision is carried out. This can be a complete number or a common prefix for a group of telephone numbers. Admits up to 15 digits (0 to 9).
Length	Length assigned to this prefix. Admits values between 1 and 15.

1.3. APPLY

This command is applied to certain configured parameters immediately activating them.

The newly configured parameters are not activated until this command is used with the exception of the volume gains parameters. These automatically activate on configuration so they can be easily adjusted.

The parameters which dynamically activate through the **APPLY** command are:

- The table for assigning telephone numbers to addresses.
- Prefix table
- The table for assigning telephone numbers to lines.
- Tone timers.
- Voice Activity Detection.

Syntax:

```
H323 Config> APPLY
```

Example:

```
H323 Config> APPLY
H323 Config>
```

1.4. DELETE

Permits you to delete elements from distinct configuration tables.

Syntax:

```
H323 Config> DELETE ?
ADDRESS
CODEC-CLASS
LINE
PREFIX
TABLE
```

a) DELETE ADDRESS

This deletes an element from the telephone numbers to IP addresses assignment table. Requests the entry depending on the telephone number and the IP address. If the exact data is not found, the operation is not carried out.

Example:

```
H323 Config> DELETE ADDRESS
Telephone number? 610
Ip address?: [192.6.1.131]?
H323 Config>
```

b) DELETE CODEC-CLASS

Deletes an element from the codec class table. Requests the class identifier. Admits values between 1 and 15 inclusive. If the class is not found, an informative message appears.

Example:

```
H323 Config> DELETE CODEC
Codec-class Id[0]? 2
Class not found

H323 Config>DELETE CODEC
Codec-class Id[0]? 3
H323 Config>
```

Values outside this margin give rise to an error message.

c) DELETE LINE

Deletes all the elements from the numbers to lines assignment table coinciding with the administered telephone number. Requests entry depending on the telephone number. If the entry is not found, the operation is not carried out.

Example:

```
H323 Config> DELETE LINE
Telephone number ?
H323 Config>
```

d) DELETE PREFIX

Deletes an element from the prefix table. Requests entry depending on the telephone number. If the specific entry is not found, the operation is not carried out.

Example:

```
H323 Config> DELETE PREFIX
Prefix ?
H323 Config>
```

e) DELETE TABLE

Completely deletes an assignment table.

Syntax:

```
H323 Config> DELETE TABLE ?
ADDRESS
LINE
PREFIX
```

DELETE TABLE ADDRESS

Deletes the telephone numbers to IP addresses assignment table.

Example:

```
H323 Config> DELETE TABLE ADDRESS
H323 Config>
```

DELETE TABLE LINE

Deletes the numbers to lines assignment table.

Example:

```
H323 Config> DELETE TABLE LINE
H323 Config>
```

DELETE TABLE PREFIX

Deletes the prefix length table.

Example:

```
H323 Config> DELETE TABLE PREFIX
H323 Config>
```

1.5. DISABLE

Syntax:

```
H323 Config> DISABLE ?
FAST-CONNECT
LINE
REGISTER-E164
SUSPEND-CALL
VAD
```

a) DISABLE FAST-CONNECT

Disables the fast connection procedure that facilitates the H323 call initialization process. The fast-connect process is disabled by default.

Example:

```
H323 Config> DISABLE FAST-CONNECT
H323 Config>
```

b) *DISABLE LINE*

The receive call facility is disabled on the line. This command is useful in configurations where not all the lines are being used: the idea here is to prevent calls being diverted to another non-configured line when the configured lines are occupied. This command permits you to disable a specific line or all of them if they're given as line –1. Admits values between 1 and the number of lines in the device. The lines are enabled by default.

Example:

```
H323 Config>DISABLE LINE
Line (-1 -> all lines)[1]? 2
H323 Config>H323 Config>
```

If an incorrect line number is given, an error is displayed.

c) *DISABLE REGISTER-E164*

The device, when registering with the gatekeeper (RAS RRQ message) can include information on its extensions. This information can be expressed in various ways, one of them being in E.164 format. Through this command you can prevent the lines' E.164 identifiers being known by the gatekeeper. This command is useful when you want the gatekeeper to admit calls depending on a different type of information and not that of the E.164 identifiers. The registration for the E.164 extensions are enabled by default.

Example:

```
H323 Config> DISABLE REGISTER
H323 Config>
```

d) *DISABLE SUSPEND-CALL*

Lines configured in FXS mode when receiving a call permit suspend call behavior. This mode permits you to hang up the called number without hanging up the established line and allows you to carry on with the conversation once more by simply picking up the called telephone number. This behavior can be disabled through this command so that when hanging up on the called number, the call is completely terminated. This behavior is enabled by default.

Example:

```
H323 Config> DISABLE SUSPEND-CALL
Line (-1 -> all lines)[1]? 2
H323 Config>
```

If an incorrect line number is given, an error is displayed.

When the lines does not admit suspend call, the text *ns* together with the type of interface is displayed on listing the configuration.

Example:

```
H323 Config> LIST LINE
Line?[1]?1

Telephone number: 33              Interface type: FXS/ns
Direct dialing:                   State: Enabled
Identifier H323:                  Priority: 9

Codec: G723 5.3Kbps               VAD: Disabled
Frames H323/packet RTP: 1 ( 20 bytes) DTMF relay : in band

Speaker attenuation: 0    dB      Tone level: 0 dB
Mic gain: 10 dB

H323 Config>
```

e) DISABLE VAD

Disables the voice activity detection. In this way, the silent frames are codified in exactly the same way as the voice frames and the data flow is constant. VAD is enabled by default.

Example:

```
H323 Config> DISABLE VAD
H323 Config>
```

1.6. ENABLE

Syntax:

```
H323 Config> ENABLE ?
FAST-CONNECT
LINE
REGISTER-E164
SUSPEND-CALL
VAD
```

a) ENABLE FAST-CONNECT

Enables the fast connect procedures that facilitates the H323 call initialization process. The fast-connect procedure is disabled by default.

Example:

```
H323 Config>ENABLE FAST-CONNECT
H323 Config>
```

Fax service is not available when fast connect is enabled,.

b) ENABLE LINE

The receive call facility is enabled on the line. You can also enable all the lines if the line value is –1. Admits values between 1 and the number of lines in the device. These lines are enabled by default.

Example:

```
H323 Config>ENABLE LINE
Line (-1 -> all lines)[1]? 2
H323 Config>H323 Config>
```

If an incorrect line number is given, an error is displayed.

c) ENABLE REGISTER-E164

The device, when registering with the gatekeeper (RAS RRQ message) can include information on the extensions it has. This information can be expressed in various E.164 formats. Through this command the lines' E.164 identifiers are made known to the gatekeeper. The registration for the E.164 extensions is enabled by default.

Example:

```
H323 Config> ENABLE REGISTER
H323 Config>
```

d) ENABLE SUSPEND-CALL

Lines configured in FXS mode when receiving a call permit suspend call behavior. This mode permits you to hang up on the called number without hanging up the established line and permits you to carry on the conversation once more by simply picking up the called telephone number. This mode is maintained for up to 30 seconds which once lapsed terminates the call. This command allows you to activate this mode and is enabled in the device by default.

Example:

```
H323 Config> ENABLE SUSPEND
Line (-1 -> all lines)[1]? 2
H323 Config>
```

If an incorrect line number is given, an error is displayed.

e) ENABLE VAD

Enables the Voice Activity Detection. The use is based on detecting silences in conversation (there is no voice) eliminating the sending of audio frames, reducing the bandwidth required. During a silent situation, the hardware generates a "comfort noise", this is a noise level signal present when there is no audible voice traffic, the person on the other end does not receive the impression that the communication has been cut. VAD is enabled by default.

Example:

```
H323 Config> ENABLE VAD
H323 Config>
```

1.7. LIST

This command is used to view the various configured parameters.

Syntax:

```
H323 Config>LIST ?
ALL
CODEC-CLASS
GW
LINE
PARAMETERS
TABLE
```

a) LIST ALL

Displays the parameters from the **LIST** command with all the corresponding information. Certain parameters in the case of ISDN telephone boards are ignored and consequently are not listed.

Example:

```
H323 Config> LIST ALL


 GATEWAY PARAMETERS

Gateway internal address: 130.0.0.2
Fast Connect: Enabled              Q931 port: 1720
H323 call mode: Compatible         UDP  port: 20000

Gatekeeper address 130.0.0.10      Gateway name: Teldat-Gw
Gatekeeper zone: MyGatekeeper      Tech-Prefix : 7#
                                   Register E.164: Disabled


RAS port: 1719                     RAS time to live: 60
RAS timeout: 20                    RAS Connection attempt fail:  10

Enable Service Addr 0.0.0.0        Type of Service Disable: Play Voice Msg 1


VOICE PARAMETRES

Dial tone frequency:      425      Ring tone activity: 15
Dial voice message:                Ring tone silence:  30

Alerting tone frequency:  425      Busy tone frequency: 425
Alerting tone activity:    15      Busy tone activity:  2
Alerting tone silence:     30      Busy tone silence:   2
Alerting voice message:            Busy voice message:

Error tone frequency:     425      Error tone silence 1: 2
Error tone activity:        2      Error tone silence 2: 6
Error voice message:

DTMF tones timeout:  10            Error Timeout: 30
Maximum delay: 300
Silent timeout for Releasing a Call in FXO: 0 Secs


 LINE PARAMETERS 1

Telephone number: 33               Interface type: FXS/ns
Direct dialing:                    State: Enabled
Identifier H323:                   Priority: 9

Codec: G723 5.3Kbps                VAD: Disabled
Frames H323/packet RTP: 1 ( 20 bytes)  DTMF relay : in band

Speaker attenuation: 0   dB        Tone level: 0 dB
Mic gain: 10 dB

```

```
LINE PARAMETERS 2

Telephone number: 44                Interface type: FXS
Direct dialing:                     State: Enabled
Identifier H323:                    Priority: 9

Codec: G723 5.3Kbps                 VAD: Disabled
Frames H323/packet RTP: 1 ( 20 bytes)  DTMF relay : in band

Speaker attenuation: 0   dB         Tone level: 0 dB
Mic gain: 10 dB


 LINE PARAMETERS 3

Telephone number: 55                Interface type: FXS
Direct dialing:                     State: Enabled
Identifier H323:                    Priority: 9

Codec: G723 5.3Kbps                 VAD: Disabled
Frames H323/packet RTP: 1 ( 20 bytes)  DTMF relay : in band

Speaker attenuation: 0   dB         Tone level: 0 dB
Mic gain: 10 dB


 LINE PARAMETERS 4

Telephone number: 77                Interface type: FXS
Direct dialing:                     State: Enabled
Identifier H323:                    Priority: 9

Codec: G723 5.3Kbps                 VAD: Disabled
Frames H323/packet RTP: 1 ( 20 bytes)  DTMF relay : in band

Speaker attenuation: 0   dB         Tone level: 0 dB
Mic gain: 10 dB


Order LINE      TELEPHONE  STRIP-PREFIX DIAL-OUT-PREFIX

  1     1            33        0
  2     2            44        0
  3     3            55        0
  4     4            77        0


                          STRIP        DIAL-OUT  CODEC      TECH
Ord       IP.Add     TELEPHONE PREFIX     PREFIX CLASS    PREFIX

1       130.0.0.1          6    0                   --
2       130.0.0.1          2    0                   --
3         0.0.0.0          8    0                   --        4#
4        10.1.1.2         23    0            341    --
5         0.0.0.0        091    2            008    1         7#


Order  PREFIX         LENGTH

  1     6                 3
  2     2                 2

Id    Codec      frm/pkt (bytes)  VAD

  1  G723 5.3Kbps    1 ( 20)       E
  4  G729A 8Kbps     3 ( 30)       D

H323 Config>
```

b) LIST CODEC-CLASS

Displays the defined codec classes. This is displayed for each selected codec class, number of voice frames per RTP packets and the selected VAD configuration. By default, there is no class defined.

Example:

```
H323 Config> LIST CODEC-CLASS

Id    Codec      frm/pkt (bytes)  VAD

  1  G723 5.3Kbps    1 ( 20)      E
  4  G729A 8Kbps     3 ( 30)      D

H323 Config>
```

In order to aggregate and delete codec classes, you can use the commands **ADD CODEC-CLASS** and **DELETE CODEC-CLASS**.

c) *LIST GW*

Displays the gateway parameters.

Example:

```
H323 Config> LIST GW

Gateway internal address: 130.0.0.2
Fast Connect: Enabled            Q931 port: 1720
H323 call mode: Compatible       UDP  port: 20000

Gatekeeper address 0.0.0.0       Gateway name:
Gatekeeper zone:                 Tech-Prefix :
                                 Register E.164: Enabled

RAS port: 1719                   RAS time to live: 60
RAS timeout: 20                  RAS Connection attempt fail:  10

Enable Service Addr 0.0.0.0      Type of Service Disable: Disable Lines

H323 Config>
```

d) *LIST LINE*

Displays the line parameters.

Example:

```
H323 Config> LIST LINE
Line?[1]?1

Telephone number: 33                Interface type: FXS
Direct dialing:                     State: Enabled
Identifier H323:                    Priority: 9

Codec: G723 5.3Kbps                 VAD: Disabled
Frames H323/packet RTP: 1 ( 20 bytes)  DTMF relay : in band

Speaker attenuation: 0   dB         Tone level: 0 dB
Mic gain: 10 dB

H323 Config>
```

e) *LIST PARAMETERS*

Displays parameters associated to the telephones. Certain parameters in the case of ISDN telephone boards are ignored and consequently are not listed.

Example:

```
H323 Config> LIST PARAMETERS

Dial tone frequency:       425       Ring tone activity: 15
Dial voice message:                  Ring tone silence:  30

Alerting tone frequency:   425       Busy tone frequency: 425
Alerting tone activity:    15        Busy tone activity:  2
Alerting tone silence:     30        Busy tone silence:   2
Alerting voice message:              Busy voice message:

Error tone frequency:      425       Error tone silence 1: 2
Error tone activity:       2         Error tone silence 2: 6
Error voice message:

DTMF tones timeout:  10               Error Timeout: 30
Maximum delay: 300
Silent timeout for Releasing a Call in FXO: 0 Secs

H323 Config>
```

f) *LIST TABLE*

Syntax:

```
H323 config> LIST TABLE ?
ADDRESS
LINE
PREFIX
```

LIST TABLE ADDRESS

Displays telephone numbers to IP addresses assignment table.

Example:

```
H323 Config> LIST TABLE ADDRESS


                             STRIP        DIAL-OUT   CODEC      TECH
Ord          IP.Add   TELEPHONE PREFIX      PREFIX   CLASS     PREFIX

1         130.0.0.1          6   0                    --
2         130.0.0.1          2   0                    --
3           0.0.0.0          8   0                    --
4          10.1.1.2         23   0                34  --         4#
5           0.0.0.0        091   2               008  1          7#
H323 Config>
```

LIST TABLE LINE

Lists the numbers to lines assignment table and the compressions and expansions to be carried out in each case.

Example:

```
H323 Config> LIST TABLE LINE

Order  LINE      TELEPHONE  STRIP-PREFIX DIAL-OUT-PREFIX

  1    1         916101        0
  2    2         916102        2
  3    3         916103        0
  4    4              8        0             8001
H323 Config>
```

In order to aggregate and delete lines, use the commands **ADD LINE** and **DELETE LINE**.

LIST TABLE PREFIX

Displays the prefix length table.

Example:

```
H323 Config> LIST TABLE PREFIX

Order  PREFIX        LENGTH

  1    091              3
  2    093              3
  3    93
H323 Config>
```

In order to aggregate and delete prefixes, use the commands **ADD PREFIX** and **DELETE PREFIX**.

1.8. SET

This command is used to configure the various parameters.

Syntax:

```
H323 Config> SET ?
ADDRESS
DELAY
GATEKEEPER
GW
LINE
MODE
PORT
PERIOD-SILENT-FOR-RELEASING-CALL-IN_FXO
RAS
RING-SIGNAL
TONES
```


a) SET ADDRESS

Syntax:

```
H323 Config> SET ADDRESS ?
AVAILABLE-SERVICE
```

SET ADDRESS AVAILABLE-SERVICE

If it is configured (not 0.0.0.0) the router will check that the configured IP address is reachable from the router and will disable the VoIp service if it fails to reach the IP address. The service can be disabled

by playing a voice message or by simply disabling the lines as will be explained later. The value is 0.0.0.0 by default.

Example:

```
H323 Config> SET ADDRESS AVAILABLE-SERVICE
IP Enable Service Address? [0.0.0.0]? 138.100.23.19
H323 Config>
```

If the IP address given is erroneous, requests will be repeatedly made until this is correct.

b) SET DELAY

Configures the maximum delay admitted in a communication. During the frame reception process, the admissible delay for the correct reproduction of the voice frames is calculated and continually updated. This calculation is carried out depending on the delay each voice frame arrives with. Admissible delay correction is carried out up to the point the maximum configured admissible delay has been exceeded. In any case, any frame arriving with a greater delay than the admissible delay is discarded. This admits inclusive values between 60 and 1000. The default value is 300 milliseconds.

Example:

```
H323 Config> SET DELAY
Maximum delay?[300]? 400
H323 Config>
```

Values outside of the permitted range will give rise to an error message.

c) SET GATEKEEPER

Permits you to configure parameters associated to the gatekeeper the voice device is controlled by.

Syntax:

```
H323 Config>SET GATEKEEPER ?
ADDRESS
ZONE
```

SET GATEKEEPER ADDRESS

Configures the Gateway IP address where the Gateway is registered. By default, the device does not register with any gatekeeper and this parameter is configured as 0.0.0.0.

Example:

```
H323 Config>SET GATEKEEPER ADDRESS
IP Gatekeeper Address? [0.0.0.0]? 1.1.1.1
H323 Config>
```

If the IP address given is erroneous, requests will be repeatedly made until this is correct.

SET GATEKEEPER ZONE

Configures the identifier of the zone that must be used to register with the configured Gatekeeper. Admits up to 18 characters. If this size is exceeded, the text is truncated. In order to delete this parameter, press intro without writing anything. By default, the device does not register with any gatekeeper and does not have a zone configured.

Example:

```
H323 Config>SET GATEKEEPER ZONE
Zone[]? My-Gatekeeper
H323 Config>
```

d) *SET GW*

Permits the configuration of parameters associated with the voice gatekeeper.

Syntax:

```
H323 Config>SET GW ?
ADDRESS
CODEC
FRAMES-PACKET in RTP
NAME
TECH-PREFIX
```

SET GW ADDRESS

Configures the voice gateway's internal IP address. This is the source IP address used in all the frames related to Voice over IP (call establishment frames, capabilities, voice and voice channel control). This address is the same as the one configured as the internal IP address from the IP configuration menu. The default value is 0.0.0.0.

Example:

```
H323 Config>SET GW ADDRESS
Internal IP address [192.168.1.132]? 1.1.1.2
H323 Config>
```

If the IP address given is erroneous, requests will be repeatedly made until this is correct.

SET GW CODEC

Configures all the lines with the same codec. These can take the values G729-A, G-723-1 at 5,3 Kbps or G723-1 at 6,4Kbps. By default all the lines are configured with codec G-723-1 at 5.3 Kbps.

Example:

```
H323 Config> SET CODEC
Codec (1: G723 5.3Kbps. 2: G723 6.4Kbps, 3:G729A): [1]? 2
H323 Config>
```

If a non-permitted value is given, an error message appears.

SET GW FRAMES-PACKET in RTP

Configures all the lines with the same number of voice frames sent by each RTP datagram. This is also known as NOB in the manual. When this value is increased it means that the bandwidth needed to send voice data is diminished, although increasing the delay between them. Admits values between 1 and 6. By default all the lines are configured with value 1.

Example:

```
H323 Config> SET GW FRAMES-PACKET
No of H323Frames/ RTP packet [1 - 6]: [1]? 2
H323 Config>
```

SET GW NAME

Configures the name that the gateway registers in the gatekeeper. Admits a name of up to 18 characters. If this size is exceeded, it is truncated. In order to delete this parameter, press intro without writing anything. By default the device does not register with any gatekeeper and does not have any names configured.

Example:

```
H323 Config> SET GWNAME
Gateway Name?[]? Teldat-IPFON
H323 Config>
```

SET GW TECH-PREFIX

Configures the technological prefix defining the device in an environment controlled by a gatekeeper. Admits a text comprising of up to 11 characters. If this size is exceeded, it is truncated. By default the device does not register with any gatekeeper and does not have any technological prefix configured. This prefix is the one used if there is none configured in the address table.

Example:

```
H323 Config> SET GW TECH-PREFIX
Tech-prefix[]? 78#
H323 Config>
```

e) *SET LINE*

Permits you to independently configure parameters for each line.

Syntax:

```
H323 Config> SET LINE ?
CODEC
DIRECT DIALING
DTMF-RELAY
FRAMES/PACKET in RTP
IDENTIFIER
MIC-GAIN
PRIORITY
SPEAKER-ATTENUATION
TELEPHONE NUMBER
TONE
TYPE interface
INPUT Gain
```

SET LINE CODEC

Defines the codec to be used in the line. Values that can be taken are: G729-A, G-723-1 at 5.3 Kbps or G723-1 at 6.4Kbps. By default all the lines are configured with codec G723-1 at 5.3 Kbps.

Example:

```
H323 Config> SET LINE CODEC
Line?[1]? 1
Codec (1: G723 5.3Kbps. 2: G723 6.4Kbps, 3:G729A): [1]? 1
H323 Config>
```

If a non-permitted value is given, an error message appears.

All the lines can be configured with the same codec through the command **SET GW CODEC**.

SET LINE DIRECT DIALING

Permits you to configure a direct dial telephone number. If this field is configured, a call to this number is automatically carried out once the time indicated by the second parameter has lapsed. Admits up to 15 digits (0 to 9) and between 0 and 3 seconds as wait time. By default this parameter is not configured and the wait time is 3 seconds.

Example:

```
H323 Config> SET LINE DIRECT DIALING
Line?[1]? 1
Telephone number? 123456
H323 Config>
```

If non-numerical values are given or the maximum size is exceeded, an error message appears.

SET LINE DTMF-RELAY

Configures the DTMF digits send mode between remote ends connected by a voice call. This can be done in two ways; in band as if dealing with voice or as H.245 data (i.e. like an IP packet) in which case the ends must detect and generate the tone. By default this is configured so that the transmission is carried out in band.

Example:

```
H323 Config>SET LINE DTMF-RELAY
Line[1]? 2
DTMF Relay Mode (0 -> in band, 1-> H.245 alphanumeric)[0]? 1
H323 Config>
```

If a non-permitted value is given, an error message appears.

SET LINE FRAMES/PACKET

This is the number of voice frames sent in each RTP packet. The more voice frames sent in the packet the less bandwidth is used, however this also increases the introduced delay.

Example:

```
H323 Config> SET LINE FRAMES/PACKET
Line?[1]? 1
No of H323Frames/ RTP packet [1 - 6]: [1]? 1
H323 Config>
```

SET LINE GAIN

This is the volume gain applied at reception. It can vary between -31 and 31.

Example:

```
H323 Config> SET LINE GAIN
Line?[1]? 1
Output line attenuation [-31 to 31 dB]: [0]? -3
H323 Config>
```

SET LINE IDENTIFIER

Assigns an H.323 identifier to the line. Admits up to 18 characters. If this size is exceeded, the name is truncated. In order to delete these parameters, press intro without writing anything. By default there is no identifier configured.

Example:

```
H323 Config> SET LINE IDENTIFIER
Line?[1]?1
Identifier?[]? Line1Id
H323 Config>
```

SET LINE MIC-GAIN

This is the Telephone line input gain. It can vary between -31 and 31 or characters + or – in order to increase or diminish the value by a unit. This has a value of 10 dB by default.

Example:

```
H323 Config> SET MIC-GAIN
Line?[1]? 1
Input Gain [-31 to 31 dB]: [10]?
H323 Config>
```

If an out of range value is set, an error message will appear.

Extreme values can inhibit correct detection of DTMF tones. We recommend that any modification to this parameter should be carried out very carefully.

SET LINE PRIORITY

Line priority is used when assigning an incoming call to a line in two situations: when the called telephone number does not adjust to any configured in the line table or when the line requested is busy and a search is carried out for a free line in order to assign the call. This takes a value between 0 and 9 (0 being the maximum priority). Lines with priorities from 5 to 9 admit calls to be assigned to lines that are currently busy. Lines with priorities from 0 to 4 do not allow calls to be switched. Value 9 is set by default (lowest priority).

Example:

```
H323 Config> SET LINE PRIORITY
Line?[1]? 1
Priority?: [9]? 3
H323 Config>
```

If a non-permitted value is given, an error message appears.

SET LINE SPEAKER-ATTENUATION

This is the volume attenuation applied at reception. This can vary between -31 and 31 or characters + or – in order to increase or diminish the value by a unit. This takes a value of 0 dB by default. This command is dynamically executed.

Example:

```
H323 Config> SET LINE SPEAKER-ATTENUATION
Line?[1]? 1
Output line attenuation [-31 to 31 dB]: [0]? -3
H323 Config>
```

If an out of range value is set, an error message will appear.

SET LINE TELEPHONE-NUMBER

Configures the telephone number associated to the line. It is the calling number (ANI) sent in the call packets. This number can be automatically added to the line table, although this operation cannot be

configured in numerical expansions or compressions. Admits up to 15 digits (0 to 9). There is no default value set.

Example:

```
H323 Config> SET LINE TELEPHONE-NUMBER
Line?[1]? 1
Telephone number? 123456
Do you wish to add number to table?(Yes/No)? Y
H323 Config>
```

If non-numerical values are given or the maximum size is exceeded, an error message appears.

SET LINE TONE

This is the volume gain which generated and detected the DTMF tones. This can vary between -31 and 0 or characters + or – in order to increase or diminish the value by a unit. This has a 0 dB value by default. In cases where there is an ISDN telephone card, this command does not exist. This command is dynamically executed.

Example:

```
H323 Config> SET LINE TONE
Line?[1]? 1
Tone level [-31 to 0]?[0]? -3
H323 Config>
```

If an out of range value is set, an error message will appear.

Extreme values can inhibit correct detection of DTMF tones. We recommend that any modification to this parameter should be carried out very carefully.

SET LINE TYPE

This indicates if the line is connected to either a telephone (FXS, Foreign eXchange Station), or a line (FXO, Foreign eXchange Office). In cases where there is an ISDN telephone card, this command does not exist as the device always acts as a Network Terminator (NT). The lines are configured as FXS by default.

Example:

```
H323 Config> SET LINE TYPE
Line?[1]? 1
Interface type [1:FXS(line), 2:FXO(terminal)]: [1]? 2
H323 Config>
```

If an out of range value is set, an error message will appear.

f) *SET MODE*

Configures the voice gateway's operating mode when carrying out calls: in compatible or proprietor mode. In compatible mode, the call mechanism adjusts to the H.323 norm. This is configured in compatible mode by default. This field automatically configures to compatible on enabling the fast-connect procedure.

Example:

```
H323 Config> SET MODE
Use H323 compatible mode?:(Yes/No)? Y
H323 Config>
```

g)   SET PORT

Permits you to configure the TCP and UDP port values used in the call establishment, management and data transport protocols.

Syntax:

```
H323 Config> SET PORT ?
Q931
RAS
UDP
```

SET PORT Q931

Configures the TCP port carrying out the Q931 transactions. Admits values between 0 and 65535. The default value is 1720.

Example:

```
H323 Config> SET PORT Q931
Q931 port?[1720]? 1800
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET PORT RAS

Configures the UDP port carrying out the RAS transactions. Admits values between 0 and 65535. The default value is 1719.

Example:

```
H323 Config> SET PORT RAS
RAS port?[1719]? 1900
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET PORT UDP

This is the UDP ports base number used when sending the voice and fax RTP (Real Time Protocol) and RTCP (Real Time Control Protocol) packets. This port must have an even number; if an odd number is configured the value will be rounded down to the number immediately inferior. Admits values between 0 and 65535. The default value is 2000.

Example:

```
H323 Config> SET PORT UDP
Port:[20000]?15000
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

h) SET PERIOD-SILENT-FOR-RELEASING-CALL-IN_FXO

Configures the silent period in seconds after which a call in an FXO interface will be release. In cases where there is an ISDN telephone card, this command does not exist. Admits values between 0 and 600 seconds. The default value is 0 seconds.

Example:

```
H323 Config> SET PERIOD-SILENT-FOR-RELEASING-CALL-IN-FXO
Silent Period for Releasing a Call in FXO?[0]?60
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

i) SET RAS

Permits you to configure parameters associated to the H.323 RAS protocol.

Syntax:

```
H323 Config> SET RAS ?
PORT
RETRIES
TIMEOUT
TTL
```

SET RAS PORT

Configures the UDP port through which the RAS transactions are carried out in the same way as the **SET PORT RAS** command.

SET RAS RETRIES

Maximum number of retries in an RAS transaction. When the maximum number of retries has been reached, the transaction is considered as failed. Admits values between 0 and 100. The default value is 10.

Example:

```
H323 Config> SET RAS RETRIES
RAS retries?[10]?
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET RAS TIMEOUT

Configures the maximum wait time (in seconds) for the RAS transaction response by the configured gatekeeper. Once lapsed, the RAS request is re-sent. This is repeated the number of times configured in the previous parameter. Admits values between 0 and 600 seconds. The default value is 20 seconds.

Example:

```
H323 Config> SET RAS TIMEOUT
RAS timeout?[20]? 10
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET RAS TTL

Configures the interval (in seconds) that the gateway sends the RRQ messages with the keepAlive=TRUE field to the gatekeeper. Admits values between 0 and 600. The default value is 60 seconds.

Example:

```
H323 Config> SET RAS TTL
RAS timeout?[20]? 10
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

j) SET RING-SIGNAL

Permits you to configure the call signal (ring) set for the telephone on receiving a call. These commands are not where there is an ISDN telephone card.

Syntax:

```
H323 Config> SET RING-SIGNAL ?
ACTIVITY
SILENCE
```

SET RING-SIGNAL ACTIVITY

Configures the time in tenths of seconds during which the ring-signal is maintained active. In cases where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 25. The default value is 15 tenths of a second.

Example:

```
H323 Config> SET RING-SIGNAL ACTIVITY
Activity time?:[15]? 20
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET RING-SIGNAL SILENCE

Configures the time in tenths of seconds during which the ring-signal silence is maintained. In cases where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 30. The default value is 30 tenths of a second.

Example:

```
H323 Config> SET RING-SIGNAL SILENCE
Silence time?:[30]? 40
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

k) SET TONE

Permits you to configure the parameters related to the various tones you can hear indicating the distinct situations.

Syntax:

```
H323 Config> SET TONE ?
ALERT
BUSY
DIAL
ERROR
ERR-TIMEOUT
TIMEOUT
```

SET TONE ALERT

Configures the parameters related to the tone alert.

Syntax:

```
H323 Config>SET TONE ALERT ?
ACTIVITY
FREQUENCY
SILENCE
VOICE message
```

SET TONE ALERT ACTIVITY

Configures the time in tenths of seconds during which the tone alert is maintained active. In cases where there is an ISDN telephone card, this command does not exist. The default value is 15 tenths of a second.

Example:

```
H323 Config> SET TONE ALERT ACTIVITY
Activity time?[15]? 20
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ALERT FREQUENCY

Configures the alert tone frequency to the remote terminals. Where there is an ISDN telephone card, the command does not exist. Admits values between 0 and 4000 Hz. The default value is 425 Hz.

Example:

```
H323 Config> SET TONE ALERT FRECUENCY
Frequency?[425]?450
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ALERT SILENCE

Sets the time in tenths of seconds during which the tone alert is idle. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 30. The default value is 30 tenths of a second.

Example:

```
H323 Config> SET TONE ALERT SILENCE
Silence time?[30]? 40
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ALERT VOICE

Permits you to substitute the dialing tone for voice. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 9. There is no default value set.

Example:

```
H323 Config> SET TONE ALERT VOICE
Use voice message (Yes/No)? Y
Voice message?:[0]? 1
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE BUSY

Configures the parameters related to the busy tone.

Syntax:

```
H323 Config> SET TONE BUSY ?
ACTIVITY
FREQUENCY
SILENCE
VOICE message
```

SET TONE BUSY ACTIVITY

Configures the time in tenths of seconds during which the busy tone is maintained active. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 20. The default value is 2 tenths of a second.

Example:

```
H323 Config> SET TONE BUSY ACTIVITY
Activity time?[2]? 3
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE BUSY FREQUENCY

Configures the tone frequency indicating the remote terminal is busy in hertz. Where there is an ISDN telephone card, this command does not exist. Admits values between 0 and 4000 Hz. The default value is 425 Hz.

Example:

```
H323 Config> SET TONE BUSY FREQUENCY
Frequency?[425]?450
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE BUSY SILENCE

Configures the time in tenths of seconds during which the busy tone is maintained inactive. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 20. The default value is 2 tenths of a second.

Example:

```
H323 Config> SET TONE BUSY SILENCE
Silence time?:[2]? 3
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE BUSY VOICE

Permits you to substitute the busy tone for voice. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 9. There is no default value set.

Example:

```
H323 Config> SET TONE BUSY VOICE
Use voice message (Yes/No)? Y
Voice message?:[0]? 1
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE DIAL

Configures the parameters related to the dial tone.

Syntax:

```
H323 Config>SET TONE DIAL ?
FREQUENCY
VOICE message
```

SET TONE DIAL FREQUENCY

Dial tone frequency. Where there is an ISDN telephone card, this command does not exist. Admits values between 0 and 4000 Hz. The default value is 425 Hz.

Example:

```
H323 Config>SET TONE DIAL FREQUENCY
Frequency?[425]?450
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE DIAL VOICE

Permits you to substitute the dial tone for voice. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 9. There is no default value set.

Example:

```
H323 Config>SET TONE DIAL VOICE
Use voice message(Yes/No)? Y
Voice message?:[0]? 1
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE DTMF-TIMEOUT

Configures the maximum timeout from the moment the DTMF tone has been received until the dialing is considered finished. Admits values between 1 and 30 seconds. The default value is 10 seconds.

Example:

```
H323 Config> SET TONE DTMF-TIMEOUT
DTMF tones lapse:[10]? 20
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ERROR

Configures the parameters related to the error tone. The error tone is made up of the following sequence of elements: tone, silence 1, tone, silence 1, tone, silence 2. This sequence is continuously repeated.

Syntax:

```
H323 Config>SET TONE ERROR ?
ACTIVITY
FREQUENCY
SILENCE1
SILENCE2
VOICE message
```

SET TONE ERROR ACTIVITY

Configures the time in tenths of seconds during which the error tone is maintained active. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 20. The default value is 2 tenths of a second.

Example:

```
H323 Config> SET TONE ERROR ACTIVITY
Activity time?[2]? 3
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ERROR FREQUENCY

Configures the error tone frequency in hertz. Where there is an ISDN telephone card, the command does not exist. Admits values between 0 and 4000 Hz. The default value is 425 Hz.

Example:

```
H323 Config>SET TONE ERROR FREQUENCY
Frequency?[425]?450
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ERROR SILENCE1

Configures the time in tenths of seconds during which silence is maintained in the error tone. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 20. The default value is 2 tenths of a second.

Example:

```
H323 Config> SET TONE ERROR SILENCE1
Silence time[2]? 3
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ERROR SILENCE2

This is the time in tenths of seconds during which the error tine silence is maintained each three error tones. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 20. The default value is 6 tenths of a second.

Example:

```
H323 Config> SET TONE ERROR SILENCE2
Silence time[6]? 8
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

SET TONE ERROR VOICE

Permits you to substitute the error tone for voice. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 9. There is no default value set.

Example:

```
H323 Config> SET TONE ERROR VOICE
Use voice message (Yes/No)? Y
H323 Config>
```

SET TONE ERR-TIMEOUT

This configures the maximum wait time before switching to an error state e.g. if you pick up the telephone and do not dial a number. Where there is an ISDN telephone card, this command does not exist. Admits values between 1 and 60 seconds. The default value is 30 seconds.

Example:

```
H323 Config> SET TONE ER-TIMEOUT
Error timer:[30]? 20
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

I)   SET TYPE of Service Disable

Configures the action that will be taken to disable the service when the available service configured IP address cannot be reached. Possible actions are: Disable Lines or play a voice message. Only the disable option exists where there is an ISDN telephone board. Admits values between 1 and 9 for voice messages and 0 in order to disable the service. The lines are disabled by default.

Example:

```
H323 Config> SET TYPE
Type of Service Disable[0: Disable Lines N:Play Voice Message N]: [1]? 1
H323 Config>
```

If a value is set outside of the permitted range, an error message will appear.

1.9. EXIT

Use the **EXIT** command to return to the previous prompt.

Syntax:

```
H323 config> EXIT
```


Example:

```
H323 config> EXIT
Config>
```

1.10. CONFIGURATION COMMAND TREE STRUCTURE

ADD
      ADDRESS
      CODEC-CLASS
      LINE
      PREFIX

APPLY

DELETE
      ADDRESS
      CODEC-CLASS
      LINE
      PREFIX
      TABLE
            ADDRESS
            LINE
            PREFIX

DISABLE
      FAST-CONNECT
      LINE
      REGISTER-E164
      SUSPEND-CALL
      VAD

ENABLE
      FAST-CONNECT
      LINE
      REGISTER-E164
      SUSPEND-CALL
      VAD

LIST
      ALL
      CODEC-CLASS
      GW
      LINE
      PARAMETERS
      TABLE
            ADDRESS
            LINE
            PREFIX

SET
      ADDRESS
            AVAILABLE-SERVICE
      DELAY
      GATEKEEPER
            ADDRESS
            ZONE
      GW
            ADDRESS
            CODEC

FRAMES/PACKET in RTP
NAME
TECH-PREFIX
LINE
CODEC
DIRECT-DIALING
DTMF-RELAY
FRAMES-PACKET in RTP
IDENTIFIER
MIC-GAIN
PRIORITY
SPEAKER-ATTENUATION
TELEPHONE-NUMBER
TONE
TYPE interface
MODE
PORT
Q931
UDP
RAS
PERIOD-FOR-RELEASING-CALL-IN_FXO
RAS
PORT
RETRIES
TIMEOUT
TTL
RING-SIGNAL
ACTIVITY
SILENCE
TONES
ALERT
ACTIVITY
FREQUENCY
SILENCE
VOICE message
BUSY
ACTIVITY
FREQUENCY
SILENCE
VOICE message
DIAL
FREQUENCY
VOICE message
ERROR
ACTIVITY
FREQUENCY
SILENCE1
SILENCE2
VOICE message
ERR-TIMEOUT
TIMEOUT
TYPE of Service Disable

EXIT

2. Voice Recording

The voice gateway permits you to reproduce voice instead of using the corresponding error or alert tones (see the commands in the SET TONE group). This makes it easier for the user to identify the situation in question.

In order to record voice, you need a telephone directly connected to the device in any line. The line must be previously configured in FXS mode for this. The recording mechanism is as follows:

- Pick up the receiver and you will hear the continuous dial tone.
- Press the * key in order to initiate the recording process. You will still hear the dial tone.
- In order to end the recording, press the voice number that you wish to record for the voice message. Maximum recording time is 15 seconds for G.723.1. If you have not pressed a digit, an error tone is heard.
- Hang up the receiver.

Admits the numbers 1 to 9. If this voice message already exists it is overwritten. The voice messages are stored in the application disk with the name LOCx.LOC, where x is the number from 1 to 9. You can only use voice messages in lines configured to use codec in G.723.1 format.

Chapter 3
Monitoring

1. Monitoring commands

The H.323 Protocol monitoring is accessed through the main menu in the following way:

1. At the (*) prompt, enter PROCESS 3 (or P 3).
2. At the monitoring (+) prompt, enter PROTOCOL H323 or PROTOCOL 4, or P 4.
3. At the H.323 protocol monitoring (H323 Mon>) prompt, use the monitoring commands described in this chapter to monitor the monitoring parameters.

In this chapter the H.323 monitoring commands are explained in detail. All the H.323 monitoring commands should be introduced from the H.323 prompt (H323 Mon>). The letters written in **bold** indicate the minimum number of characters which must be entered in order to make the command operative.

Command	Functions
? (HELP)	Lists the available commands or their options.
CLEAR	Clears buffers.
DISPLAY	Displays statue and statistics.
LIST	Lists calls (active or released), statistics or traces.
REGISTER	Sends a register request (RRQ) RAS packet.
UNREGISTER	Sends an unregister request (URQ) RAS packet
TRACE	Permits you to carry out debugging trace.
EXIT	Return to previous prompt.

1.1. ? (HELP)

Displays a list of available commands or options.

Syntax:

```
H323 Mon> ?
CLEAR
DISPLAY
LIST
REGISTER
UNREGISTER
TRACE
EXIT
```

1.2. CLEAR

Permits you to delete the frame statistics, error counters etc., as well as the executed calls register.

Syntax:

```
H323 Mon> CLEAR ?
RELEASED calls
STATISTICS
```

a) *CLEAR RELEASED*

Clears all the released calls register.

Example:

```
H323 Mon> CLEAR RELEASED
H323 Mon>
```

b) *CLEAR STATISTICS*

Clears the statistics for the frames, error counters etc.

Example:

```
H323 Mon> CLEAR STATISTICS
H323 Mon>
```

1.3. DISPLAY

Dynamically displays the state of the diverse voice lines and various additional parameters.

Syntax:

```
H323 Mon> DISPLAY ?
CAUSE
LINE
RAS
```

a) *DISPLAY CAUSE*

Displays the meaning of the codes used as cause for release in calls (Q931) and the finalizing of the RAS protocol transactions.

Syntax:

```
H323 Mon> DISPLAY CAUSE ?
RELEASE
RAS
```

DISPLAY CAUSE RELEASE

Displays the meaning of the codes used as cause for release in the calls (Q931). The release cause for each call is displayed through the **LIST RELEASE** command.

Example:

```
H323 Mon> DISPLAY CAUSE RELEASE
Cause code [0]? 5
Cause (5):  Local

H323 Mon>
```

DISPLAY CAUSE RAS

Displays the meaning of the codes used as cause for release for the rejection of RAS transactions. The causes for rejection are displayed through the **DISPLAY RAS** command.

Example:

```
H323 Mon> DISPLAY CAUSE RAS
Cause code [0]? 1
Cause (1):   Insufficient Resources

H323 Mon>
```

b) DISPLAY LINE

Permits you to see the line status. If the line does not have any voice traffic, the voice encoding parameters (codec, NOB and VAD) that are currently associated to the line are displayed (values given by the configuration), total of frames and bytes received and transmitted on the line and finally the total of the lost and discarded frames together with the maximum variations reached on the line.

If there is a call already established you can also view the received and transmitted frames and bytes, the numbers of the intervening telephones (only if this information is available), type of call (voice or fax), call establishment mode, delay statistics, lost and discarded frames and finally the call duration in seconds. In this case the codec being used, NOB and VAD, is displayed; this can differ from that configured by default in the line due to negotiation issues and the use of codec classes.

If the board is an ISDN telephone, the ISDN call status, the link layer status and the ISDN physical line are also displayed, as well as the number of times these have been down.

Example (Basic Telephone board):

```
H323 Mon> DISPLAY LINE
State: CALL ESTABLISHED
Codec: G723 6.4Kbps           Total Rx frames:    21116
Frames/RTP pkt: 1 ( 24 bytes) Total Rx bytes:    592196
VAD :   Enabled               Total Tx frames:    29242
                              Total Tx bytes:    992172


Absolute max variance:  82    Total lost frames:        0
                              Total discarded frm:      3


Called:  606                  Type: Voice
Calling: 931                  Fast-Start: True
Tech-prefix:

Rx frames:      21116         Tx frames:     29242
Rx bytes:       592196        Tx bytes:     992208

Delay:  60                    Variance:    0
Minimum delay:  30            Minimum variance: 160
Maximum delay:  90            Maximum variance:    0

Lost frames:        0         Discarded frames: 12
Missed frames percent:  0%

Conversation time:     267 sec.

H323 Mon>
```

Example (ISDN Telephone board):

```
H323 Mon> DISPLAY LINE
Line [1-4] :[1]? 1
State: CALL ESTABLISHED
Codec: G723 6.4Kbps          Total Rx frames:   344551
Frames/RTP pkt: 1 ( 24 bytes) Total Rx bytes:  11954316
VAD :   Enabled              Total Tx frames:   240833
                             Total Tx bytes:   6989788

Absolute max variance:  83   Total lost frames:        0
                             Total discarded frm:     67

Called:  606                 Type: Voice
Calling: 931                 Fast-Start: True
Tech-prefix:

Rx frames:       31274       Tx frames:     22363
Rx bytes:      1061724       Tx bytes:      622408

Delay:  60                   Variance:    0
Minimum delay:  30           Minimum variance: 150
Maximum delay: 150           Maximum variance:    0

Lost frames:        0        Discarded frames: 19
Missed frames percent:  0%

Conversation time:    297 sec.

Physical State : G3          Physical Link Failures : 3
Lapd : Established           LAPD Link Failures : 90
Q931 State : N10
H323 Mon>
```

c) DISPLAY RAS

Permits you to see the RAS status, the latest rejection cause and statistics.

Example:

```
H323 Mon> DISPLAY RAS
RAS state: Gateway  has been registered
Last ARJ cause:          10

Gatekeeper Confirms:      3
Gatekeeper Rejects:       1
Registration Confirms:    1
Registration Rejects:     0
Unregistration Confirms:  0
Admission Confirms:       2
Admission Rejects:        1
Disengage Confirms:       0
Info Request Responses:   0
Non Standard Messages:    0
Unknown Messages:         0

H323 Mon>
```

1.4. LIST

Syntax:

```
H323 Mon> LIST ?
ACTIVE calls
RELEASED calls
STATISTICS
TRACE
```

a) LIST ACTIVE

Lists the calls that are currently active. This displays the associated line, the calling and caller (only if this information is available), the start time and date, direction of the call and finally the type of call.

On listing the called telephone, the information on the results of applying the configured numerical expansions appear both for the incoming and outgoing calls. The direction of the call takes the values: I (input), for incoming calls or those executed from another voice terminal somewhere else in the IP network, and the value 0 (output) for outgoing calls or for those carried out from the voice gateway to another device somewhere in the IP network. The type of call takes the values: I (internal) for calls made between two lines in the device and E (external) in cases of a call between a line in the device and another remote.

Example:

```
H323 Mon> LIST ACTIVE
LINE    CALLED ADDRESS      ST. TIME  ST. DATE  DIRECTION  TYPE
        CALLING ADDRESS

  2     0                   13:15:25  06:05:99  O          E
        091
H323 Mon>
```

b) LIST RELEASED

List of the last 100 released calls. This displays the associated line, the calling and caller (only if this information is available), the start and end time and date, direction of the call and finally the reason for terminating the call.

On listing the called telephone, the information on the results of applying the configured numerical expansions appear both for the incoming and outgoing calls. The direction of the call takes the values: I (input), for incoming calls or those executed from another voice terminal somewhere else in the IP network, and the value 0 (output) for outgoing calls or for those carried out from the voice gateway to another device somewhere in the IP network. The type of call takes the values: I (internal) for calls made between two lines in the device and E (external) in cases where a call between a line in the device and another remote. The release cause appears encoded; in order to attain information on the meaning, use the **DISPLAY CAUSE RELEASE** command.

Example:

```
H323 Mon> LIST RELEASED
LINE  CALLED ADDRESS    ST.TIME    ST.DATE    DIRECTION  TYPE  CAUSE
      CALLING ADDRESS   E.TIME     E.DATE

  3   931               15:49:37   05:05:99   O          E     3
      915073            15:49:38   05:05:99

  2   931               17:11:52   05:05:99   O          E     3
      091               17:11:52   05:05:99

  3   931               17:12:41   05:05:99   O          E     3
      915073            17:12:41   05:05:99

  2   931               17:15:32   05:05:99   O          E     3
      091               17:15:32   05:05:99

  3   931               18:15:42   05:05:99   O          E     3
      915073            18:15:42   05:05:99

H323 Mon>
```

c) *LIST STATISTICS*

Lists various statistics related to both the device and the latest calls carried out by each line.

Syntax:

```
H323 Mon> LIST STATISTICS ?
GW
LAST
```

LIST STATISTICS GW

Lists the statistics common to all the device lines. This displays the system initiation date and time, the total number of calls executed from initiation, the number of active calls and possible calls and finally the average call duration.

Example:

```
H323 Mon> LIST STATISTICS GW

Startup time: 16:01:27          10/ 5/99
Total calls: 0
Active calls: 0
Possible additional calls: 4
Conversation mean time: 0 seconds.

H323 Mon>
```

LIST STATISTICS LAST

Displays parameters and statistics for the last call executed on the indicated line. This basically displays the same information as shown through the DISPLAY LINE command. Information displayed is the voice encoding parameters (codec, NOB and VAD), the received and transmitted frames and bytes, the numbers of the intervening telephones (only if this information is available), delay statistics, lost and discarded frames and finally the call duration in seconds.

Example:

```
H323 Mon> LIST STATISTICS LAST
Line [1-4] : [1]? 1
Codec: G723 6.4Kbps          Rx frames:       70
Frames/RTP pkt: 1 ( 24 bytes) Rx bytes:      1380
VAD :  Enabled               Tx frames:      234
                             Tx bytes:         0


Called:  581                 Type: Voice
Calling: 931                 Fast-Start: True
Minimum delay:  90           Minimum variance: 160
Maximum delay:  90           Maximun variance:   0


Lost frames:         0       Discarded frames: 0
Missed frames percent:  0%


Conversation time:    358 sec.

H323 Mon>
```

d) *LIST TRACE*

Lists a previously captured trace. The traces are stored in a buffer which is handled in a round robin fashion so when this overflows, the device begins to overwrite the first trace stored. If the buffer is empty, a text will appear indicating this. The content of the buffer is not lost when displayed. If you wish to delete the buffer content, you must initiate another capture process through the **TRACE** command. In order to stop the capture process, use the **TRACE STOP** command.

Example:

In this example, the Q931 messages exchanged between two voice gateways in order to establish the call are displayed. It also checks that the call establishment mode adjusts to the fast-connect method.

```
H323 Mon> LIST TRACE
TRACE LIST

00:49:26 TCPc     : Opening channel 1 (size=2)
00:49:26 TCPc     : Local Address:
00:49:26 TCPc     :  0> <740> TransportAddress = (0) .  <864> CHOICE ...
00:49:26 TCPc     :  1> . <973> ipAddress = (-555) .  <861> SEQUENCE
00:49:26 TCPc     :  2> . . <974> ip = (4) '..(.' =0xc0a828fd <192.168.40.253> .  <846> OCTET STRING (4..4)
00:49:26 TCPc     :  2> . . <976> port = (3003) .  <762> INTEGER (0..65535)
00:49:26 TCPc     : Connecting channel 1
00:49:26 TCPc     : Remote Address:
00:49:26 TCPc     :  0> <740> TransportAddress = (0) .  <864> CHOICE ...
00:49:26 TCPc     :  1> . <973> ipAddress = (-555) .  <861> SEQUENCE
00:49:26 TCPc     :  2> . . <982> ip = (4) '..).' =0xc0a829fd <192.168.41.253> .  <846> OCTET STRING (4..4)
00:49:26 TCPc     :  2> . . <984> port = (1720) .  <762> INTEGER (0..65535)
00:49:26 TCPc     : Connected channel 1
00:49:26 TCPc     : Listen on channel 2 (size=3)
00:49:26 TCPc     : Address:
00:49:26 TCPc     :  0> <1018> TransportAddress = (0) .  <864> CHOICE ...
00:49:26 TCPc     :  1> . <1026> ipAddress = (-555) .  <861> SEQUENCE
00:49:26 TCPc     :  2> . . <1027> ip = (4) '..(.' <192.168.40.253> .  <846> OCTET STRING (4..4)
00:49:26 TCPc     :  2> . . <1029> port = (3008) .  <762> INTEGER (0..65535)
00:49:27 TCPc     : New message (channel 1) sent --> setup:
00:49:27 TCPc     : Message:
00:49:27 TCPc     :  0> <755> Q931Message = (-555) .  <1366> SEQUENCE [PRIVATE 1]
00:49:27 TCPc     :  1> . <756> protocolDiscriminator = (8) .  <763> INTEGER (0..255)
00:49:27 TCPc     :  1> . <757> callReferenceValue = (-555) .  <1362> CHOICE
00:49:27 TCPc     :  2> . . <758> twoBytes = (24508) .  <1360> INTEGER [EMPTY 2] (0..65535)
00:49:27 TCPc     :  1> . <759> message = (-555) .  <1347> CHOICE ...
00:49:27 TCPc     :  2> . . <760> setup = (-555) .  <1285> SET [EMPTY 5] ...
00:49:27 TCPc     :  3> . . . <762> bearerCapability = (-555) .  <1263> SEQUENCE [EMPTY 4]
00:49:27 TCPc     :  4> . . . . <763> octet3 = (-555) .  <1260> SEQUENCE ...
00:49:27 TCPc     :  5> . . . . . <764> codingStandard = (0) .  <1186> INTEGER (0..3)
00:49:27 TCPc     :  5> . . . . . <765> informationTransferCapability = (8) .  <1252> INTEGER (0..31)
00:49:27 TCPc     :  4> . . . . <766> octet4 = (-555) .  <1256> SEQUENCE ...
00:49:27 TCPc     :  5> . . . . . <767> transferMode = (0) .  <1186> INTEGER (0..3)
00:49:27 TCPc     :  5> . . . . . <768> informationTransferRate = (16) .  <1252> INTEGER (0..31)
```

```
00:49:27 TCPc      : 4> . . . . <769> octet5 = (-555) .  <1253> SEQUENCE ...
00:49:27 TCPc      : 5> . . . . . <770> layer1Ident = (1) .  <1186> INTEGER (0..3)
00:49:27 TCPc      : 5> . . . . . <771> userInformationLayer1Protocol = (5) .  <1252> INTEGER (0..31)
00:49:27 TCPc      : 3> . . . <950> display = (21) 'Nucleox Plus - VoxNet' =0x4e75636c656f7820506c7573202d20566f.
<1200> IA5String [EMPTY 40]
00:49:27 TCPc      : 3> . . . <922> callingPartyNumber = (-555) .  <1232> SEQUENCE [EMPTY 108]
00:49:27 TCPc      : 4> . . . . <925> octet3 = (-555) .  <1226> SEQUENCE ...
00:49:27 TCPc      : 5> . . . . . <926> typeOfNumber = (2) .  <1218> INTEGER (0..7)
00:49:27 TCPc      : 5> . . . . . <927> numberingPlanIdentification = (1) .  <1185> INTEGER (0..15)
00:49:27 TCPc      : 4> . . . . <923> numberDigits = (4) '2001' =0x32303031.  <1225> IA5String
00:49:27 TCPc      : 3> . . . <916> calledPartyNumber = (-555) .  <1244> SEQUENCE [EMPTY 112]
00:49:27 TCPc      : 4> . . . . <919> octet3 = (-555) .  <1241> SEQUENCE ...
00:49:27 TCPc      : 5> . . . . . <920> typeOfNumber = (2) .  <1218> INTEGER (0..7)
00:49:27 TCPc      : 5> . . . . . <921> numberingPlanIdentification = (1) .  <1185> INTEGER (0..15)
00:49:27 TCPc      : 4> . . . . <917> numberDigits = (3) '216' =0x323136.  <1225> IA5String
00:49:27 TCPc      : 3> . . . <772> userUser = (-555) .  <1174> SEQUENCE [APPLICATION 126]
00:49:27 TCPc      : 4> . . . . <773> protocolDiscriminator = (5) .  <763> INTEGER (0..255)
00:49:27 TCPc      : 4> . . . . <774> h323-UserInformation = (-555) .  <1018> SEQUENCE [PRIVATE 0] ...
00:49:27 TCPc      : 5> . . . . . <775> h323-uu-pdu = (-555) .  <1007> SEQUENCE ...
00:49:27 TCPc      : 6> . . . . . . <776> h323-message-body = (-555) .  <997> CHOICE ...
00:49:27 TCPc      : 7> . . . . . . . <777> setup = (-555) .  <916> SEQUENCE ...
00:49:27 TCPc      : 8> . . . . . . . . <778> protocolIdentifier = (6)  { itu-t recommendation h 2250 0 2 }.  <668>
OBJECT IDENTIFIER
00:49:27 TCPc      : 8> . . . . . . . . <932> sourceAddress = (0) .  <186> SEQUENCE OF
00:49:27 TCPc      : 9> . . . . . . . . . <933> * = (0) .  <748> CHOICE ...
00:49:27 TCPc      : 10> . . . . . . . . . . <934> e164 = (4) '2001' =0x32303031.  <747> IA5String (1..128) FROM
'#*,0123456789'
00:49:27 TCPc      : 8> . . . . . . . . <780> sourceInfo = (0) .  <831> SEQUENCE ...
00:49:27 TCPc      : 9> . . . . . . . . . <892> vendor = (0) .  <769> SEQUENCE ...
00:49:27 TCPc      : 10> . . . . . . . . . . <893> vendor = (0) .  <764> SEQUENCE ...
00:49:27 TCPc      : 11> . . . . . . . . . . . <894> t35CountryCode = (11) .  <763> INTEGER (0..255)
00:49:27 TCPc      : 11> . . . . . . . . . . . <895> t35Extension = (11) .  <763> INTEGER (0..255)
00:49:27 TCPc      : 11> . . . . . . . . . . . <896> manufacturerCode = (11) .  <762> INTEGER (0..65535)
00:49:27 TCPc      : 10> . . . . . . . . . . <897> productId = (16) 'Test application' =0x54657374206170706c69636174696969
f6e.  <768> OCTET STRING (1..256)
00:49:27 TCPc      : 10> . . . . . . . . . . <899> versionId = (9) 'RADVision' =0x524144566973696f6e.  <768> OCTET
STRING (1..256)
00:49:27 TCPc      : 9> . . . . . . . . . <901> gateway = (0) .  <828> SEQUENCE ...
00:49:27 TCPc      : 10> . . . . . . . . . . <928> protocol = (0) .  <97> SEQUENCE OF
00:49:27 TCPc      : 11> . . . . . . . . . . . <929> * = (0) .  <817> CHOICE ...
00:49:27 TCPc      : 12> . . . . . . . . . . . . <930> voice = (0) .  <789> SEQUENCE ...
00:49:27 TCPc      : 13> . . . . . . . . . . . . . <931> supportedPrefixes = (0) .  <779> SEQUENCE OF
00:49:27 TCPc      : 9> . . . . . . . . . <902> mc = (0) .  <83> BOOLEAN
00:49:27 TCPc      : 9> . . . . . . . . . <903> undefinedNode = (0) .  <83> BOOLEAN
00:49:27 TCPc      : 8> . . . . . . . . <936> destinationAddress = (0) .  <186> SEQUENCE OF
00:49:27 TCPc      : 9> . . . . . . . . . <937> * = (0) .  <748> CHOICE ...
00:49:27 TCPc      : 10> . . . . . . . . . . <938> e164 = (3) '216' =0x323136.  <747> IA5String (1..128) FROM
'#*,0123456789'
00:49:27 TCPc      : 8> . . . . . . . . <945> destCallSignalAddress = (0) .  <864> CHOICE ...
00:49:27 TCPc      : 9> . . . . . . . . . <946> ipAddress = (-555) .  <861> SEQUENCE
00:49:27 TCPc      : 10> . . . . . . . . . . <947> ip = (4) '..).' =0xc0a829fd <192.168.41.253> .  <846> OCTET STRING
(4..4)
00:49:27 TCPc      : 10> . . . . . . . . . . <949> port = (1720) .  <762> INTEGER (0..65535)
00:49:27 TCPc      : 8> . . . . . . . . <783> activeMC = (0) .  <83> BOOLEAN
00:49:27 TCPc      : 8> . . . . . . . . <784> conferenceID = (16) 'V4444...'..w]...' =0x5634343434ef030027c1fc775df71
9c7.  <674>
OCTET STRING (16..16)
00:49:27 TCPc      : 8> . . . . . . . . <786> conferenceGoal = (-555) .  <909> CHOICE ...
00:49:27 TCPc      : 9> . . . . . . . . . <787> create = (-555) .  <127> NULL
00:49:27 TCPc      : 8> . . . . . . . . <788> callType = (-555) .  <379> CHOICE ...
00:49:27 TCPc      : 9> . . . . . . . . . <789> pointToPoint = (-555) .  <127> NULL
00:49:27 TCPc      : 8> . . . . . . . . <977> sourceCallSignalAddress = (-555) .  <864> CHOICE ...
00:49:27 TCPc      : 9> . . . . . . . . . <978> ipAddress = (-555) .  <861> SEQUENCE
00:49:27 TCPc      : 10> . . . . . . . . . . <979> ip = (4) '..(.' =0xc0a828fd <192.168.40.253> .  <846> OCTET STRING
(4..4)
00:49:27 TCPc      : 10> . . . . . . . . . . <981> port = (3003) .  <762> INTEGER (0..65535)
00:49:27 TCPc      : 8> . . . . . . . . <1320> callIdentifier = (-555) .  <665> SEQUENCE ...
00:49:27 TCPc      : 9> . . . . . . . . . <1321> guid = (16) 'V4444...'..w]...' =0x5634343434ef020027c1fc775df3b5bf.
<675> OCTET STRING (16..16)
00:49:27 TCPc      : 8> . . . . . . . . <1314> fastStart = (-555) .  <907> SEQUENCE OF
00:49:27 TCPc      : 9> . . . . . . . . . <1315> * = (19) '......@........(.N!' =0x0000000d000740000a04000100c0a828fd.
<758> OCTET STRING
00:49:27 TCPc      : 9> . . . . . . . . . <1317> * = (30) '@......M..@........(.N"...(.N#' =0x401299060401004d00074000
1114000100.  <758> OCTET STRING
00:49:27 TCPc      : 8> . . . . . . . . <790> mediaWaitForConnect = (0) .  <83> BOOLEAN
00:49:27 TCPc      : 8> . . . . . . . . <791> canOverlapSend = (0) .  <83> BOOLEAN
00:49:27 TCPc      : 6> . . . . . . <792> h245Tunneling = (0) .  <83> BOOLEAN
00:49:27 TCPc      : 5> . . . . . <952> user-data = (-555) .  <1015> SEQUENCE ...
00:49:27 TCPc      : 6> . . . . . . <954> protocol-discriminator = (5) .  <763> INTEGER (0..255)
00:49:27 TCPc      : 6> . . . . . . <953> user-information = (7) 'Teldat.' =0x54656c64617400.  <1014> OCTET STRING
(1..131)
00:49:28 TCPc      : Binary:
00:49:28 TCPc      : 00000   08 02 5f bc 05 04 03 88 90 a5 28 15 4e 75 63 6c    |.._¼...^•¥(.Nucl|
00:49:28 TCPc      : 00016   65 6f 78 20 50 6c 75 73 20 2d 20 56 6f 78 4e 65    |eox Plus - VoxNe|
```

```
00:49:28 TCPc      : 00032   74 6c 05 a1 32 30 30 31 70 04 a1 32 31 36 7e 00   |tl.¡2001p.¡216~.|
00:49:28 TCPc      : 00048   b7 05 60 b8 06 00 08 91 4a 00 02 01 01 80 53 34   |·.`...‘J....€S4|
00:49:28 TCPc      : 00064   28 c0 0b 0b 00 0b 0f 54 65 73 74 20 61 70 70 6c   |(À.....Test appl|
00:49:28 TCPc      : 00080   69 63 61 74 69 6f 6e 08 52 41 44 56 69 73 69 6f   |ication.RADVisio|
00:49:28 TCPc      : 00096   6e 40 01 3c 05 01 00 00 01 01 00 54 90 c0 a8 29   |n@.<.......T•À¨)|
00:49:28 TCPc      : 00112   fd 06 b8 00 56 34 34 34 34 ef 03 00 27 c1 fc 77   |ý..V4444ï..‘Áûw|
00:49:28 TCPc      : 00128   5d f7 19 c7 00 45 1c 07 00 c0 a8 28 fd 0b bb 11   |]÷.Ç.E...À¨(ý.».|
00:49:28 TCPc      : 00144   00 56 34 34 34 34 ef 02 00 27 c1 fc 77 5d f3 b5   |.V4444ï..‘Áûw]óµ|
00:49:28 TCPc      : 00160   bf 34 02 13 00 00 00 0d 00 07 40 00 0a 04 00 01   |¿4........@.....|
00:49:28 TCPc      : 00176   00 c0 a8 28 fd 4e 21 1e 40 12 99 06 04 01 00 4d   |.À¨(ýN!.@.™....M|
00:49:28 TCPc      : 00192   00 07 40 00 11 14 00 01 00 c0 a8 28 fd 4e 22 00   |..@....À¨(ýN".|
00:49:28 TCPc      : 00208   c0 a8 28 fd 4e 23 01 00 01 00 06 80 01 00 00 05   |À¨(ýN#.....€....|
00:49:28 TCPc      : 00224   06 54 65 6c 64 61 74 00                           |.Teldat.|
00:49:28 TCPc      : New message (channel 1) recv <-- callProceeding:
00:49:28 TCPc      : Binary:
00:49:28 TCPc      : 00000   08 02 df bc 02 7e 00 44 05 21 80 06 00 08 91 4a   |..ß¼.~.D.!€...‘J|
00:49:28 TCPc      : 00016   00 02 28 c0 0b 0b 00 0b 0f 54 65 73 74 20 61 70   |..(À.....Test ap|
00:49:28 TCPc      : 00032   70 6c 69 63 61 74 69 6f 6e 08 52 41 44 56 69 73   |plication.RADVis|
00:49:28 TCPc      : 00048   69 6f 6e 00 48 00 11 00 56 34 34 34 34 ef 02 00   |ion.H...V4444ï..|
00:49:28 TCPc      : 00064   27 c1 fc 77 5d f3 b5 bf 06 80 01 00               |‘Áûw]óµ¿.€..|
00:49:28 TCPc      : 0> <1325> Q931Message = (3) .  <1366> SEQUENCE [PRIVATE 1]
00:49:28 TCPc      : 1> . <1327> protocolDiscriminator = (8) .  <763> INTEGER (0..255)
00:49:28 TCPc      : 1> . <1328> callReferenceValue = (5245) .  <1362> CHOICE
00:49:28 TCPc      : 2> . . <1329> twoBytes = (57276) .  <1360> INTEGER [EMPTY 2] (0..65535)
00:49:28 TCPc      : 1> . <1330> message = (1087) .  <1347> CHOICE ...
00:49:28 TCPc      : 2> . . <1331> callProceeding = (1) .  <1332> SET [EMPTY 2] ...
00:49:28 TCPc      : 3> . . . <1332> userUser = (2) .  <1174> SEQUENCE [APPLICATION 126]
00:49:28 TCPc      : 4> . . . . <1333> protocolDiscriminator = (5) .  <763> INTEGER (0..255)
00:49:28 TCPc      : 4> . . . . <1334> h323-UserInformation = (-111) .  <1018> SEQUENCE [PRIVATE 0] ...
00:49:28 TCPc      : 5> . . . . . <1335> h323-uu-pdu = (-111) .  <1007> SEQUENCE ...
00:49:28 TCPc      : 6> . . . . . . <1336> h323-message-body = (1087) .  <997> CHOICE ...
00:49:28 TCPc      : 7> . . . . . . . <1337> callProceeding = (-111) .  <975> SEQUENCE ...
00:49:28 TCPc      : 8> . . . . . . . . <1338> protocolIdentifier = (6)  { itu-t recommendation h 2250 0 2 }.  <668>
OBJECT IDENTIFIER
00:49:28 TCPc      : 8> . . . . . . . . <1340> destinationInfo = (-111) .  <831> SEQUENCE ...
00:49:28 TCPc      : 9> . . . . . . . . . <1341> vendor = (-111) .  <769> SEQUENCE ...
00:49:28 TCPc      : 10> . . . . . . . . . <1342> vendor = (-111) .  <764> SEQUENCE ...
00:49:28 TCPc      : 11> . . . . . . . . . . <1343> t35CountryCode = (11) .  <763> INTEGER (0..255)
00:49:28 TCPc      : 11> . . . . . . . . . . <1344> t35Extension = (11) .  <763> INTEGER (0..255)
00:49:28 TCPc      : 11> . . . . . . . . . . <1345> manufacturerCode = (11) .  <762> INTEGER (0..65535)
00:49:28 TCPc      : 10> . . . . . . . . . <1346> productId = (16) 'Test application' =0x54657374206170706c6963617469
6f6e.  <768> OCTET STRING (1..256)
00:49:28 TCPc      : 10> . . . . . . . . . <1348> versionId = (9) 'RADVision' =0x524144566973696f6e.  <768> OCTET
STRING (1..256)
00:49:28 TCPc      : 9> . . . . . . . . . <1350> gateway = (-111) .  <828> SEQUENCE ...
00:49:28 TCPc      : 9> . . . . . . . . . <1351> mc = (0) .  <83> BOOLEAN
00:49:28 TCPc      : 9> . . . . . . . . . <1352> undefinedNode = (0) .  <83> BOOLEAN
00:49:28 TCPc      : 8> . . . . . . . . <1353> callIdentifier = (-111) .  <665> SEQUENCE ...
00:49:28 TCPc      : 9> . . . . . . . . . <1354> guid = (16) 'V4444...'..w]...' =0x5634343434ef020027c1fc775df3b5bf.
<675> OCTET STRING (16..16)
00:49:28 TCPc      : 6> . . . . . . <1356> h245Tunneling = (0) .  <83> BOOLEAN
00:49:29 TCPc      : New message (channel 1) recv <-- alerting:
00:49:29 TCPc      : Binary:
00:49:29 TCPc      : 00000   08 02 df bc 01 7e 00 44 05 23 80 06 00 08 91 4a   |..ß¼.~.D.#€...‘J|
00:49:29 TCPc      : 00016   00 02 28 c0 0b 0b 00 0b 0f 54 65 73 74 20 61 70   |..(À.....Test ap|
00:49:29 TCPc      : 00032   70 6c 69 63 61 74 69 6f 6e 08 52 41 44 56 69 73   |plication.RADVis|
00:49:29 TCPc      : 00048   69 6f 6e 00 48 00 11 00 56 34 34 34 34 ef 02 00   |ion.H...V4444ï..|
00:49:29 TCPc      : 00064   27 c1 fc 77 5d f3 b5 bf 06 80 01 00               |‘Áûw]óµ¿.€..|
00:49:29 TCPc      : 0> <1408> Q931Message = (3) .  <1366> SEQUENCE [PRIVATE 1]
00:49:29 TCPc      : 1> . <1410> protocolDiscriminator = (8) .  <763> INTEGER (0..255)
00:49:29 TCPc      : 1> . <1411> callReferenceValue = (5245) .  <1362> CHOICE
00:49:29 TCPc      : 2> . . <1412> twoBytes = (57276) .  <1360> INTEGER [EMPTY 2] (0..65535)
00:49:29 TCPc      : 1> . <1413> message = (8840) .  <1347> CHOICE ...
00:49:29 TCPc      : 2> . . <1414> alerting = (1) .  <1339> SET [EMPTY 1] ...
00:49:29 TCPc      : 3> . . . <1415> userUser = (2) .  <1174> SEQUENCE [APPLICATION 126]
00:49:29 TCPc      : 4> . . . . <1416> protocolDiscriminator = (5) .  <763> INTEGER (0..255)
00:49:29 TCPc      : 4> . . . . <1417> h323-UserInformation = (-111) .  <1018> SEQUENCE [PRIVATE 0] ...
00:49:29 TCPc      : 5> . . . . . <1418> h323-uu-pdu = (-111) .  <1007> SEQUENCE ...
00:49:29 TCPc      : 6> . . . . . . <1419> h323-message-body = (8840) .  <997> CHOICE ...
00:49:29 TCPc      : 7> . . . . . . . <1420> alerting = (-111) .  <985> SEQUENCE ...
00:49:29 TCPc      : 8> . . . . . . . . <1421> protocolIdentifier = (6)  { itu-t recommendation h 2250 0 2 }.  <668>
OBJECT IDENTIFIER
00:49:29 TCPc      : 8> . . . . . . . . <1423> destinationInfo = (-111) .  <831> SEQUENCE ...
00:49:29 TCPc      : 9> . . . . . . . . . <1424> vendor = (-111) .  <769> SEQUENCE ...
00:49:29 TCPc      : 10> . . . . . . . . . <1425> vendor = (-111) .  <764> SEQUENCE ...
00:49:29 TCPc      : 11> . . . . . . . . . . <1426> t35CountryCode = (11) .  <763> INTEGER (0..255)
00:49:29 TCPc      : 11> . . . . . . . . . . <1427> t35Extension = (11) .  <763> INTEGER (0..255)
00:49:29 TCPc      : 11> . . . . . . . . . . <1428> manufacturerCode = (11) .  <762> INTEGER (0..65535)
00:49:29 TCPc      : 10> . . . . . . . . . <1429> productId = (16) 'Test application' =0x54657374206170706c6963617469
6f6e.  <768> OCTET STRING (1..256)
00:49:29 TCPc      : 10> . . . . . . . . . <1431> versionId = (9) 'RADVision' =0x524144566973696f6e.  <768> OCTET
STRING (1..256)
00:49:29 TCPc      : 9> . . . . . . . . . <1433> gateway = (-111) .  <828> SEQUENCE ...
00:49:29 TCPc      : 9> . . . . . . . . . <1434> mc = (0) .  <83> BOOLEAN
00:49:29 TCPc      : 9> . . . . . . . . . <1435> undefinedNode = (0) .  <83> BOOLEAN
00:49:29 TCPc      : 8> . . . . . . . . <1436> callIdentifier = (-111) .  <665> SEQUENCE ...
00:49:29 TCPc      : 9> . . . . . . . . . <1437> guid = (16) 'V4444...'..w]...' =0x5634343434ef020027c1fc775df3b5bf.
<675> OCTET STRING (16..16)
```

```
00:49:29 TCPc      : 6> . . . . . . <1439> h245Tunneling = (0) .   <83> BOOLEAN
00:49:30 TCPc      : New message (channel 1) recv <-- connect:
00:49:30 TCPc      : Binary:
00:49:30 TCPc      : 00000   08 02 df bc 07 28 06 68 75 65 6c 76 61 7e 00 90   |..ß¼.(.huelva~.•|
00:49:30 TCPc      : 00016   05 22 c0 06 00 08 91 4a 00 02 00 c0 a8 29 fd 0c   |."À...'J...À¨)ý.|
00:49:30 TCPc      : 00032   01 28 c0 0b 0b 00 0b 0f 54 65 73 74 20 61 70 70   |.(À.....Test app|
00:49:30 TCPc      : 00048   6c 69 63 61 74 69 6f 6e 08 52 41 44 56 69 73 69   |lication.RADVisi|
00:49:30 TCPc      : 00064   6f 6e 00 56 34 34 34 34 ef 03 00 27 c1 fc 77 5d   |on.V4444ï..'Áûw]|
00:49:30 TCPc      : 00080   f7 19 c7 09 10 11 00 56 34 34 34 34 ef 02 00 27   |÷.Ç....V4444ï..'|
00:49:30 TCPc      : 00096   c1 fc 77 5d f3 b5 bf 34 02 1a 00 00 00 0d 00 07   |Áûw]óµ¿4........|
00:49:30 TCPc      : 00112   40 00 11 14 00 01 00 c0 a8 29 fd 4e 22 00 c0 a8   |@......À¨)ýN".À¨|
00:49:30 TCPc      : 00128   29 fd 4e 23 17 40 00 00 06 04 01 00 4d 00 07 40   |)ýN#.@......M..@|
00:49:30 TCPc      : 00144   00 0a 04 00 01 00 c0 a8 29 fd 4e 21 06 80 01 00   |......À¨)ýN!.€..|
00:49:30 TCPc      : 0> <1490> Q931Message = (3) .   <1366> SEQUENCE [PRIVATE 1]
00:49:30 TCPc      : 1> . <1492> protocolDiscriminator = (8) .   <763> INTEGER (0..255)
00:49:30 TCPc      : 1> . <1493> callReferenceValue = (5245) .   <1362> CHOICE
00:49:30 TCPc      : 2> . . <1494> twoBytes = (57276) .   <1360> INTEGER [EMPTY 2] (0..65535)
00:49:30 TCPc      : 1> . <1495> message = (4696) .   <1347> CHOICE ...
00:49:30 TCPc      : 2> . . <1496> connect = (2) .   <1324> SET [EMPTY 7] ...
00:49:30 TCPc      : 3> . . . <1497> display = (6) 'huelva' =0x6875656c7661.   <1200> IA5String [EMPTY 40]
00:49:30 TCPc      : 3> . . . <1499> userUser = (2) .   <1174> SEQUENCE [APPLICATION 126]
00:49:30 TCPc      : 4> . . . . <1500> protocolDiscriminator = (5) .   <763> INTEGER (0..255)
00:49:30 TCPc      : 4> . . . . <1501> h323-UserInformation = (-111) .   <1018> SEQUENCE [PRIVATE 0] ...
00:49:30 TCPc      : 5> . . . . . <1502> h323-uu-pdu = (-111) .   <1007> SEQUENCE ...
00:49:30 TCPc      : 6> . . . . . . <1503> h323-message-body = (4696) .   <997> CHOICE ...
00:49:30 TCPc      : 7> . . . . . . . <1504> connect = (-111) .   <964> SEQUENCE ...
00:49:30 TCPc      : 8> . . . . . . . . <1505> protocolIdentifier = (6)  { itu-t recommendation h 2250 0 2 }.   <668>
OBJECT IDENTIFIER
00:49:30 TCPc      : 8> . . . . . . . . <1507> h245Address = (7441) .   <864> CHOICE ...
00:49:30 TCPc      : 9> . . . . . . . . . <1508> ipAddress = (-111) .   <861> SEQUENCE
00:49:30 TCPc      : 10> . . . . . . . . . . <1509> ip = (4) '..).' =0xc0a829fd <192.168.41.253> .   <846> OCTET STRING
(4..4)
00:49:30 TCPc      : 10> . . . . . . . . . . <1511> port = (3073) .   <762> INTEGER (0..65535)
00:49:30 TCPc      : 8> . . . . . . . . <1512> destinationInfo = (-111) .   <831> SEQUENCE ...
00:49:30 TCPc      : 9> . . . . . . . . . <1513> vendor = (-111) .   <769> SEQUENCE ...
00:49:30 TCPc      : 10> . . . . . . . . . . <1514> vendor = (-111) .   <764> SEQUENCE ...
00:49:30 TCPc      : 11> . . . . . . . . . . . <1515> t35CountryCode = (11) .   <763> INTEGER (0..255)
00:49:30 TCPc      : 11> . . . . . . . . . . . <1516> t35Extension = (11) .   <763> INTEGER (0..255)
00:49:30 TCPc      : 11> . . . . . . . . . . . <1517> manufacturerCode = (11) .   <762> INTEGER (0..65535)
00:49:30 TCPc      : 10> . . . . . . . . . . <1518> productId = (16) 'Test application' =0x54657374206170706c6963617469
6f6e.   <768> OCTET STRING (1..256)
00:49:30 TCPc      : 10> . . . . . . . . . . <1520> versionId = (9) 'RADVision' =0x524144566973696f6e.   <768> OCTET
STRING (1..256)
00:49:30 TCPc      : 9> . . . . . . . . . <1522> gateway = (-111) .   <828> SEQUENCE ...
00:49:30 TCPc      : 9> . . . . . . . . . <1523> mc = (0) .   <83> BOOLEAN
00:49:30 TCPc      : 9> . . . . . . . . . <1524> undefinedNode = (0) .   <83> BOOLEAN
00:49:30 TCPc      : 8> . . . . . . . . <1525> conferenceID = (16) 'V4444...'..w]...' =0x5634343434ef030027c1fc775df71
9c7.   <674> OCTET STRING (16..16)
00:49:30 TCPc      : 8> . . . . . . . . <1527> callIdentifier = (-111) .   <665> SEQUENCE ...
00:49:30 TCPc      : 9> . . . . . . . . . <1528> guid = (16) 'V4444...'..w]...' =0x5634343434ef020027c1fc775df3b5bf.
<675> OCTET STRING (16..16)
00:49:30 TCPc      : 8> . . . . . . . . <1530> fastStart = (2) .   <963> SEQUENCE OF
00:49:30 TCPc      : 9> . . . . . . . . . <1531> * = (26) '......@........).N"...).N#' =0x0000000d000740001114000100c0
a829fd.   <758> OCTET STRING
00:49:30 TCPc      : 9> . . . . . . . . . <1534> * = (23) '@......M..@........).N!' =0x400000060401004d000740000a0400
0100.   <758> OCTET STRING
00:49:30 TCPc      : 6> . . . . . . <1536> h245Tunneling = (0) .   <83> BOOLEAN
Found 233 events of 233
H323 Mon>
```

1.5. <u>REGISTER</u>

Sends a register request RAS (RRQ) packet to the configured gatekeeper.

Syntax:

```
H323 Mon> REGISTER
```

Example:

```
H323 Mon> REGISTER
H323 Mon>
```

1.6. <u>UNREGISTER</u>

Sends an unregister request RAS (URQ) packet to the gatekeeper.

Syntax:

```
H323 Mon> UNREGISTER
```

Example:

```
H323 Mon> UNREGISTER
H323 Mon>
```

1.7. TRACE

This permits you to start and stop the trace capture process in the UDP or the TCP channels for debugging purposes. On starting the trace, the depth will be asked for (number of elements), the line length and the debugging level (from 1 to 3).

The capture of traces use a great deal of the system's resources and time and should only be used for debugging purposes. It is important that this process is not enabled unless necessary, for this reason we recommend using the **TRACE STOP** command so it is inactive.

Syntax:

```
H323 Mon> TRACE ?
STOP
TCPCHAN
UDPCHAN
```

a) TRACE STOP

Stop the H.323 trace capture process.

Example:

```
H323 Mon> TRACE STOP
H323 Mon>
```

b) TRACE TCPCHAN

Starts the trace in the TCP channel to see for example the Q.931 or the H.245.

Example:

```
H323 Mon> TRACE TCPCHAN
Number of elements[1000]?
Line length[160]?
Debugging Level[3]?
H323 Mon>
```

c) TRACE UDPCHAN

Starts the trace in the UDP channel to see for example the RAS transactions.

Example:

```
H323 Mon> TRACE UDPCHAN
Number of elements[1000]?
Line length[160]?
Debugging Level[3]?
H323 Mon>
```

1.8. EXIT

Use the **EXIT** command to return to the previous prompt.

Syntax:

```
H323 Mon> EXIT
```

Example:

```
H323 Mon> EXIT
+
```

1.9. MONITORING COMMAND TREE STRUCTURE

CLEAR
      RELEASED calls
      STATISTICS

DISPLAY
      CAUSE
            RELEASED
            RAS
      LINE
      RAS

LIST
      ACTIVE calls
      RELEASED calls
      STATISTICS
            GW
            LAST call
      TRACE

REGISTER

UNREGISTER

TRACE
      STOP
      UDPCHAN
      TCPCHAN

2. Echo compensation

In some Voice over IP installations where analog Voice Kits are used (i.e. with FXS/FXO interfaces) echoes can be produced. This is due to the fact that voice traffic going from two to four wires through a hybrid coil where the impedances are adjusted is not perfect. The echo source is displayed in figure 1.
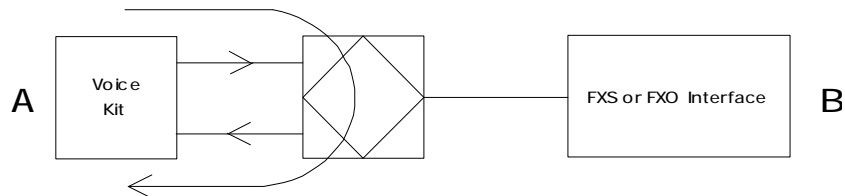

Figure 1: Appearance of the echo when passing from two to four wires

Our device has an echo cancellation incorporated which reduces echo. However, this only works effectively when the Signal to Echo ratio is great or equal to 6 dB. In this case the signal is the outgoing signal from the voice kit towards the hybrid.

The only configuration parameter affecting echo is the microphone gain in such a way that less gain, greater signal to echo ratio and consequently the cancellation functions better. (The loudspeaker gain is not significant so this is applied to both the signal and the echo).

If the echo is perceived on the A end of the conversation, the microphone gain parameter should be adjusted at the other B end. This is due to the fact that the echo produced at A as in figure 1 is coded and transmitted via IP to the other end so it arrives with an appreciable time difference with respect to the original signal and consequently manifests as a perceptible echo.