

Vanguard Managed Solution

Vanguard Applications Ware
Serial Feature Protocols

Airline Control Protocol

Notice

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Overview

Introduction

This manual describes the Airline Line Control (ALC) feature available for use with Vanguard products.

ALC support provides access to X.25 networks for ALC hosts and terminals in a multi-drop environment. Any number of ALC ports can be configured for the enabled node, limited only by available memory.

Supported Platforms

The ALC protocol is available on all Vanguard products, including the 6500^{PLUS} platforms.

■ Note

On the 6500^{PLUS} ALC will only run on CPU^{PLUS} and AIO ports.

ALC protocol support is enabled using a CSK (Custom Software Key). Any number of ALC ports can be configured for the enabled node. ALC support consists of:

- ALC TPAD (Terminal PAD) emulating an ALC host
- ALC HPAD (Host PAD) emulating an ALC interchange

Alarms & Reports

See the *Vanguard Applications Ware Alarms & Reports Manual* (Part Number T0005) for details on ALC alarms and reports.

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About ALC

Introduction

ALC is a communications procedure used between airline hosts (and certain types of concentrators) and airline terminal equipment. SITA refers to this protocol as P1024B, which is based on IBM's 1006 protocol used in the implementation of the SABRE system. P1024B is principally associated with hosts running the PARS/IPARS reservation system software.

ALC Protocol

The major features of ALC are:

- It is a synchronous protocol using full duplex communications lines.
 - It is a polled protocol with a strict master/slave relationship. All communication is initiated by the terminal concentrator (master). Slave stations transmit only in response to polls from the master.
 - The character set used is IPARS (6 data bits, no parity bits).
 - All messages are protected by a cyclic check character (CCC), but only very limited procedures are defined in the protocol for recovering from transmission errors.
 - The protocol does not specify any type of acknowledgment because it is normally used in interactive applications where any missing message is immediately obvious to the terminal operator.
 - The addressing structure of ALC is at two levels: interchange address (IA) and terminal address (TA). IAs are cluster controllers (or terminals acting as cluster controllers). TAs are individual terminals or printers.
-

Product Features

The features of the ALC PAD are:

- Compliance with SITA's P1024B Communication Control Protocol.
- Call originator configurable as either HPAD (Host PAD) or TPAD (Terminal PAD).
- When used in an HPAD/TPAD combination, only data is passed over the X.25 network. The software emulates the interchanges and host as appropriate.
- Header configuration: The PAD allows a configured header to precede ALP (Airline Protocol) data when transmitted across the X.25 network.
- Address mapping allows the logical addresses presented to the host to differ from the physical addresses used by the TPAD.
- End-to-end line control allows the PAD to be configured as:
 - de-coupled
 - partially coupled
 - fully coupled.

ALC and X.25 are independent in a de-coupled configuration. Either X.25 is dependent on ALC or ALC is dependent on X.25 in a partially coupled configuration. In a fully coupled configuration, ALC is dependent on X.25 and X.25 is dependent on ALC.

- Inactivity timeout: If no data has been transmitted or received on X.25 within a configurable time frame, the SVC (switched virtual circuit) is dropped.

- Configurable end-to-end flow control: If Flow Control is specified, the PAD limits the rate at which it acquires new data for transmission in a particular direction to match the rate at which it can be transmitted in that direction. As a result, an X.25 or airline protocol handler with a growing queue of data for transmission to the PAD restricts the arrival of new data and enacts flow control mechanisms appropriate to that protocol to decrease the size of the queue.
- ALC line speeds from 1200 to 19200 bps.
- Forward and reverse abort options allow the network manager to specify that only one message should be processed from a terminal at any given time. If a second message is received (another input from the terminal), either the oldest message is discarded (forward abort) or the most recent is discarded (reverse abort).
- Control Terminal Port (CTP) support for configuring the ALC PAD.
- Supports terminal, printer, and concentrator devices which conform to SITA's P1024B Protocol, based on IBM's 1006 Protocol.

Limitations

The sum of the speeds of all ALC ports configured on any one Vanguard product should not exceed those listed in this table:

<i>Vanguard Product</i>	<i>Maximum Speed</i>
Vanguard 6520, Vanguard 6560, Vanguard 6400 Series (all versions)	115.2 Kbps
Vanguard 100, Vanguard 200, Vanguard 300, Vanguard 305, Vanguard 320, Vanguard 34x and 6500 ^{PLUS}	57.6 Kbps

If you exceed the limitations noted above, a Watchdog Timeout may occur causing some Vanguard products to continuously reset themselves. This table identifies the procedure you should followed if your Vanguard node is continually resetting.

<i>Step</i>	<i>Action</i>
1	Remove the FLASH memory.
2	Restart the node from PROM.
3	Default the node.
4	Replace the FLASH memory.
5	Reconfigure the ALC ports speeds on the node so they do not exceed the recommended limits specified above

Applications

Linked HPAD-TPAD Configuration

Figure 1 illustrates ALC in a linked HPAD-TPAD configuration.



Figure 1. Combined HPAD TPAD Operation

In this mode of operation, the HPAD and TPAD are linked. The HPAD emulates the downline network and the TPAD emulates the host. All polling is handled locally, so only data is passed over X.25.

Configuration

Guidelines

The entities that may be configured are lines, interchanges, and terminals. A line corresponds to a port on Vanguard products. An entity can only be configured if the entity on which it is dependent has been configured. For example, an interchange can only be configured if its associated line is configured. Additional configuration guidelines are listed below:

- A terminal can only be configured if its associated interchange is configured.
- All timers are specified in milliseconds and have a 50 ms granularity unless otherwise stated.
- Unlike other protocols, the address of an interchange and that of a terminal cannot be modified. You must create a new entity and delete the old one.
- Connections to X.25 are restricted to SVCs only.
- The software does not implement any higher-level protocols (for example, secure printing protocols). Any such protocol messages pass through the software transparently.

Configuring ALC Line (Port) Record Parameters

To configure an ALC Port and define your ALC Line Record parameters:

Step	Action
1	Select Configure from the Main menu (see Figure 2).
2	Select Port .
3	Configure the parameters for the ALC line using the information that follows Figure 2. ■ Note Menu entries may move positions depending on the options that have been installed and configured for the node.

Configure Menu

Figure 2 shows the Configure menu with the ALC options.

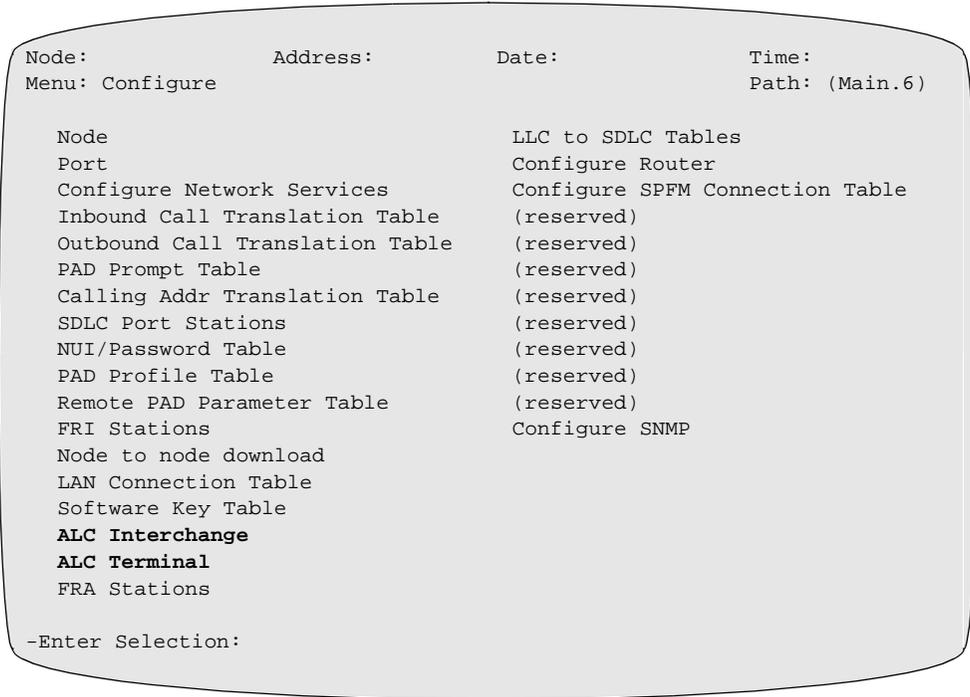


Figure 2. Configure Menu

Parameters

When you are configuring an ALC Port, these parameters appear:

■ Note

Unless otherwise indicated, you must perform a Port boot for changes to these parameters to take effect.

Port Number

Range:	1 to 54
Default:	1
Description:	This number corresponds to the physical port at the rear of the unit and is the Port Record reference number.

Port Type

Range:	NULL, PAD, X25, SDLC, FRI, TBOP, ALC, FRA, PPP
Default:	PAD
Description:	<p>Specifies the Port Type of the selected Port Number.</p> <p>■ Note The available port types are dependent upon the platform and the software option package.</p> <ul style="list-style-type: none"> • NULL - NULL type port • PAD - PAD type port • X25 - X25 type port • SDLC - SDLC hpad/tpad • FRI - Frame Relay Interface port • TBOP - TBOP type port • ALC - ALC type port • FRA - Frame Relay Access port • PPP - PPP type port <p>■ Note You must perform a Node boot for changes to this parameter to take effect.</p>

Subtype

Range:	HPAD, TPAD
Default:	TPAD
Description:	<p>Specifies the ALC port subtype.</p> <ul style="list-style-type: none"> • HPAD - Host PAD connects to host. • TPAD - Terminal PAD connects to interchanges. <p>■ Note You must perform a Node boot for changes to this parameter to take effect.</p>

Port Control

Range:	SIMP, EMRI, EMDC, DTR, ALC_DTE
Default:	SIMP
Description:	<p>Specifies the level of line control required by the port:</p> <ul style="list-style-type: none"> • SIMP - Simple connection with no control signal handshake. • DTR - Connection with DTR control signal handshake. • EMRI - Port emulates a modem and does dial-in/out handshake with RI. • EMDC - Port emulates a modem and does dial-in/out handshake with DCD. • ALC_DTE - DTE emulation with RTS/CTS handshake.

Clock Source

Range:	INT, EXT
Default:	INT
Description:	<p>Specifies the clock type to be used:</p> <ul style="list-style-type: none"> • INT - Internal clock source. • EXT - External clock source.

Clock Speed

Range:	1200, 2400, 4800, 9600, 19200, 38400
Default:	9600
Description:	Specifies the speed of the port in bits per second, when using internal clocking.

Host Timeout

Range:	50 to 100000
Default:	1000
Description:	<p>Specifies the amount of time (in milliseconds) that can pass, on a poll coerced line, before a host is considered to have gone down. This applies to HPAD only.</p> <p>■ Note Refer to the parameter ALC Line Options on page 11 for additional information on coerced lines.</p>

Maximum Message Size

Range:	10 to 10000
Default:	960
Description:	<p>Specifies the maximum size of messages that can be sent or received on this line excluding padding characters. TPAD may receive multiple messages in a frame; HPAD may transmit multiple messages in a frame.</p> <p>Note You must perform a Node boot for changes to this parameter to take effect.</p>

RTS-CTS Timeout

Range:	50 to 10000
Default:	50
Description:	<p>Specifies the time, in milliseconds, within which CTS must be raised following the RTS signal.</p> <p>Note This parameter only applies to ports configured for ALC_DTE.</p>

Leading Padding Character

Range:	00 to 3F (HEX)
Default:	00
Description:	<p>Specifies the character to use when inserting leading padding characters.</p>

Number of Leading Padding Characters

Range:	0 to 100
Default:	0
Description:	<p>Specifies the number of padding characters to be transmitted before each frame.</p> <p>Note You must perform a Node boot for changes to this parameter to take effect.</p>

Trailing Padding Character

Range:	00 to 3F (HEX)
Default:	00
Description:	Specifies the character to use when inserting trailing padding characters. ■ Note The actual number of trailing characters on the output is one more than the configured number.

Number Of Trailing Padding Characters

Range:	0 to 100
Default:	0
Description:	Specifies the number of padding characters to be transmitted after each frame. ■ Note You must perform a Node boot for changes to this parameter to take effect.

ALC Line Options

Range:	NONE, EMB_SYNC, MASK8, COERCE, CLASH, RFRTM, RZRTM, SOFT_SYNC, NULLS, BACKTOBACK
Default:	NONE
Description:	<p>Defines the operating characteristics of the ALC line. One or more options may be specified by summing (separating them with the plus “+” symbol).</p> <ul style="list-style-type: none"> • NONE: No options specified. • EMB_SYNC: Valid on the HPAD only. EMB_SYNC controls the use of embedded synchronization characters. If set, synchronization characters are inserted between messages in a transmitted frame. • MASK8: Indicates that the 8 bit (that is, the bit with the value 8) is treated as zero when examining interchange addresses on this line. If the MASK8 parameter is specified, only interchange addresses in which the 8 bit has a zero value should be defined. • COERCE: Applicable to the HPAD only. Coerce indicates that poll coercion is to be used on this line. If set, a poll received for one interchange on this line is treated as a poll for all interchanges active on the line. • CLASH: Applicable to the HPAD only and specifies whether action is taken if poll clash is detected. If set, poll responses are aborted if a poll is received while a response to a previous poll is still being transmitted. • RFRTM: Applicable to the HPAD only and indicates that ALC generates responses to Response and Forward RTM (Response Time Monitor) messages sent on the line. <p>■ Note Response Time Monitor is a protocol on the PARS Computer Reservation System. It is used to measure PARS response times and to troubleshoot suspect data communication connections. A number of different types of RTM messages are used for this purpose.</p> <ul style="list-style-type: none"> • RZRTM: Applicable to the HPAD only and indicates that ALC generates responses to inquiry RTM messages sent on the line. • SOFT_SYNC: Specifies that software synchronization is used on this line. • NULLS: Specifies that Nulls are allowed in the data stream without aborting the frame. • BACKTOBACK: Applicable to the HPAD only. Back-to-Back causes the ALC driver to search for the synchronization characters immediately following the end of frame (CCC). If not found, the driver enters hunt mode and waits for synchronization.

Poll Delay Timer

Range:	50 to 100000
Default:	100
Description:	<p>Specifies the length of time to wait, in milliseconds, after completing a poll cycle on this line and before starting the next poll cycle. This would apply when all line interchanges are in the slow poll mode.</p> <p>■ Note This parameter is applicable to the TPAD only.</p>

Minimum Interval Between Polls

Range:	0 to 100000
Default:	100
Description:	<p>Specifies the minimum length of time between polls issued on the line. A value of zero indicates no minimum interval (polls are issued as quickly as possible).</p> <p>■ Note This parameter is applicable to the TPAD only.</p>

Connection Type

Range:	NONE, X25
Default:	NONE
Description:	<p>Specifies the type of connection required.</p> <p>■ Note This parameter is not displayed when a connection is configured on a higher entity (i.e., if a connection is configured on a Port, Connection Type will not appear for configuration of the Interchange Record).</p> <p>When the Connection Type is set, the connection parameters specified in the “ALP Connection Parameters” section on page 20 appear.</p> <p>■ Note You must perform a Node boot for changes to this parameter to take effect.</p>

ALC Interchange Parameters

ALC interchanges are associated with a specific ALC line (a port on the unit). To configure ALC Interchange parameters:

Step	Action
1	Select Configure from the Main menu (see Figure 2).
2	Select ALC Interchange .
3	Configure the ALC Interchange parameters using the information below.

■ Note

Unless otherwise indicated, you must perform an Interchange Boot for changes to these parameters to take effect.

Port Number

Range:	1 to 54
Default:	1
Description:	Corresponds to the physical port at the rear of the unit and is the number of the ALC line with which to associate this interchange definition.

Interchange Address

Range:	01 to 3F HEX
Default:	01
Description:	Specifies the address of the interchange to be configured. These address are used as line control characters and are therefore not used: 0D, 0F, 1D, 2D, 3D, and 3F.

Option on Invalid CCC

Range:	DISCARD, IGNORE, REENTER, RESEND
Default:	DISCARD
Description:	<p>Specifies the action to be taken when a message is received with an incorrect checksum.</p> <ul style="list-style-type: none"> • DISCARD: Discards the message if a bad CCC is detected. • IGNORE: Ignores the incorrect checksum and treats the message as correct. • RESEND: Specifies that the “resend request” message is sent to the terminal if a bad CCC is detected. (TPAD only.) • REENTER: Specifies that the “Configure reenter” message is sent to the terminal if a bad CCC is detected. (TPAD only.)

Host Timeout

Range:	50 to 100000
Default:	2000
Description:	Specifies the time period, in milliseconds, after which the host is considered to be down if a poll is not received. (HPAD only.)

General Terminal Address (GTA)

Range:	01 to 3F HEX
Default:	2C
Description:	Specifies the terminal address to which broadcast messages are sent when the General Terminal Address option is selected. (TPAD only.)

Maximum Components Per Frame

Range:	1 to 100
Default:	10
Description:	<p>Specifies the maximum number of message segments which ALC transmits in one frame (HPAD) or that it expects to receive (TPAD).</p> <p>Note You must perform a Node boot for changes to this parameter to take effect.</p>

Fast Poll Cycle Count

Range:	1 to 1000
Default:	1
Description:	<p>Specifies the polling rate for an interchange which is in fast polling mode. A poll is issued to this interchange once in every “n” poll cycles (“n” represents a poll cycle on the line).</p> <p>Note This parameter is applicable to the TPAD only.</p>

Slow Poll Cycle Count

Range:	1 to 1000
Default:	20
Description:	<p>Specifies the polling rate for an interchange which is in slow polling mode. A slow poll IA is issued once in every “n” poll cycles on the line.</p> <p>Note This parameter is applicable to the TPAD only.</p>

N1 Counter

Range:	1 to 100
Default:	3
Description:	<p>Specifies the number of polls which are sent without receiving a response before the polling rate of an interchange is lowered.</p> <p>Note This parameter is applicable to the TPAD only.</p>

N2 Counter

Range:	1 to 100
Default:	1
Description:	<p>Specifies the number of good poll responses that are required before a change to a faster rate of polling is made.</p> <p>Note This parameter is applicable to the TPAD only.</p>

T1 Timeout

Range:	100 to 100000
Default:	100
Description:	<p>Specifies the time in milliseconds within which an interchange must start responding to a poll. This parameter is the same as the SITA P1024B T1 timer value. The timer granularity is 100 ms.</p> <p>Note This parameter is applicable to the TPAD only.</p>

T2 Timeout

Range:	100 to 100000
Default:	250
Description:	<p>Specifies the time in milliseconds within which an interchange must complete its transmission. This parameter is the same as the SITA P1024B T2 timer. The timer granularity is 100 ms.</p> <p>■ Note This parameter is applicable to the TPAD only.</p>

Reenter Message

Range:	0 to 64 alphanumeric characters
Default:	(Blank)
Description:	<p>Specifies the text of a message sent to terminals when a message with an incorrect CCC is received. The message is only sent if the action on receipt of an invalid CCC is REENTER.</p> <p>■ Note This parameter is applicable to the TPAD only.</p> <p>■ Note Press the space bar to blank this field.</p>

Start Message

Range:	0 to 64 alphanumeric characters
Default:	(Blank)
Description:	<p>Specifies the text of a message sent to terminals when polling of this interchange is started. The message is only sent if the start/stop message option is configured.</p> <p>■ Note This parameter is applicable to the TPAD only.</p> <p>■ Note Press the space bar to blank this field.</p>

Stop Message

Range:	0 to 64 alphanumeric characters
Default:	(Blank)
Description:	<p>Specifies the text of a message sent to terminals before polling of this interchange is stopped. The message is only sent if the start/stop message option is configured.</p> <p>■ Note This parameter is applicable to the TPAD only.</p> <p>■ Note Press the space bar to blank this field.</p>

ALC Interchange Options

Range:	NONE, GTA, NOPOLL, RESET, STST
Default:	NONE
Description:	<p>Specifies the ALC options to use:</p> <ul style="list-style-type: none"> • NONE: No options specified. • GTA: Valid on the TPAD only. GTA indicates that there is a General Terminal Address which may be used for broadcasting to all terminals on this interchange. • NOPOLL: Valid on the TPAD only. Nopoll indicates that this interchange is not to be polled. This option should be specified for secondary interchanges only, that is, interchanges that send messages when a primary interchange is polled. • RESET: Indicates that the interchange is capable of handling ALC Reset commands. <p>■ Note If this option is not selected, the Reset command is discarded and an alarm is generated.</p> <ul style="list-style-type: none"> • STST: Valid on the TPAD only. STST indicates that the Start message is sent to terminals when polling is started and the Stop message is sent when polling is stopped. <p>■ Note One or more options may be specified by summing (separating them by a plus sign “+”).</p>

Valid Terminal Address (TA) List

Range:	01 - 3F HEX for each list entry
Default:	10, 11, 12, 13, 14, 15, 17, 18, 19, 1A, 1B, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2A, 2B, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 3A, 3B
Description:	<p>Specifies the valid terminals (between 1 and 63) for each ALC interchange. The valid terminal addresses for the interchange are specified as a list of numbers separated by commas.</p> <p>■ Note It is only possible to send a message to a terminal address that appears in this list. Any message received for a terminal address that is not in the list is discarded, and a report is generated.</p> <p>Each address can also be assigned one of the options – /r or /f – that indicate whether forward abort (/f) or reverse abort (/r) is to be set on the terminal in the HPAD configuration, for example, 10/f. The default is not to set either type of abort option.</p> <p>The abort options ensure that only one message is queued to the host from a particular terminal. They cause the transmit queue to be searched for a message from the terminal associated with the current transmit message. If a message is found, forward abort causes this message to be discarded, and the most recent one is queued. Reverse abort causes the most recent message to be discarded. Note that these options operate on complete messages, not individual message segments.</p> <p>■ Note A range of addresses can be specified by using a dash (i.e., 2C-32).</p>

Connection Type

Range:	NONE, X25
Default:	NONE
Description:	<p>Specifies the type of connection required.</p> <p>■ Note This parameter is not displayed when a connection is configured on a higher entity (i.e., if a connection is configured on a Port, Connection Type will not appear for configuration of the Interchange Record).</p> <p>When the Connection Type is set, the connection parameters specified in the “ALP Connection Parameters” section on page 20 appear.</p> <p>■ Note You must perform a Node boot for changes to this parameter to take effect.</p>

ALC Terminal Parameters

A specific ALC terminal need only be configured if it requires its own connection. If the connection is made to the parent line or interchange, then the terminal need not be configured explicitly.

Step	Action
1	Select Configure from the Main menu (see Figure 2).
2	Select ALC Terminal .
3	Configure the ALC Terminal parameters using the information below.

■ Note

Unless otherwise indicated, you must perform a Terminal boot for changes to these parameters to take effect.

Port Number

Range:	1 to 54
Default:	1
Description:	Identifies the physical port at the rear of the unit and is the number of the ALC line with which to associate this terminal definition.

Interchange Address

Range:	01 to 3F HEX
Default:	01
Description:	Specifies the Interchange Address with which to associate the terminal.

Terminal Address

Range:	01 to 3F HEX
Default:	01
Description:	Specifies the address of the terminal to be configured.

Connection Type

Range:	NONE, X25
Default:	NONE
Description:	<p>Specifies the type of connection required.</p> <p>■ Note This parameter is not displayed when a connection is configured on a higher entity (i.e., if a connection is configured on a Port, Connection Type will not appear for configuration of the Interchange Record).</p> <p>When the Connection Type is set, the connection parameters specified in the “ALP Connection Parameters” section on page 20 appear.</p> <p>■ Note You must perform a Node boot for changes to this parameter to take effect.</p>

ALP Connection Parameters

A connection can be created to link any ALC entity to X.25. There are, however, some rules that must be followed when creating a connection.

- 1) A connection may not be made to an entity that has a connected ancestor. For example, if a line is connected, then no connections can be made to the interchanges or terminals on that line.
- 2) A connection may not be made to an entity whose descendant is already connected. For example, a line-based connection may not be created if any of the interchanges or terminals associated with it are connected.

■ Note

These parameters only appear when the connection type is set.

Autocall

Range:	0 to 8 alphanumeric characters
Default:	(blank)
Description:	<p>This parameter is the mnemonic used to establish the call when the call request is issued. The restrictions on the name are the same as for all mnemonics. The mnemonic must be defined in the mnemonic table. If this parameter is blank, the ALP PAD waits for a call.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p> <p>■ Note Press the space bar to blank this field.</p>

Calling Address

Range:	0 to 15 decimal digits
Default:	(blank)
Description:	<p>Specifies the calling address to be used in outbound calls.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p> <p>■ Note Press the space bar to blank this field.</p>

CUD (Call User Data)

Range:	0 to 16 hex numbers
Default:	01
Description:	<p>Specifies the Call User Data field to be used in outbound calls. These hex numbers must be between 0 and FF, and must be separated by commas.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Number of Buffers

Range:	1 to 1000
Default:	5
Description:	<p>Specifies the maximum number of buffers available for data transfer in each direction. Each buffer holds one ALC message.</p> <p>■ Note You must perform a Node boot for changes to this parameter to take effect.</p>

IN Header

Range:	A list of up to 16 hexadecimal numbers, between 0 and 3F, separated by commas. The values IA and TA may also be used.
Default:	IA, TA
Description:	<p>Specifies the data that will be assumed to start all messages received from X.25. If IA and/or TA are specified in the header, the values associated with these positions are checked against the interchange or terminal addresses associated with the connection. The complete header is then removed from the message, and replaced by the interchange or terminal addresses associated with the connection.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

OUT Header

Range:	A list of up to 16 hexadecimal numbers, between 0 and 3F, separated by commas. The values IA and TA may also be used.
Default:	IA, TA
Description:	<p>Specifies the data that will be assumed to start all messages sent to X.25. If IA and/or TA are specified in the header, the values associated with these positions are checked against the interchange or terminal addresses associated with the connection. The complete header is then removed from the message, and replaced by the interchange or terminal addresses associated with the connection.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Reconnect Timeout

Range:	1 to 1000
Default:	10
Description:	<p>This parameter defines the time in seconds between attempts to establish an X.25 virtual circuit when the ALP connection is enabled or after the SVC has been cleared.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Inactivity Timeout

Range:	0 to 1000
Default:	0
Description:	<p>This parameter defines the time in seconds after which the X.25 call is cleared if no data is transmitted or received. A value of zero disables this timer. Following the expiration of the timer, a further X.25 call request is issued when any data is received from ALC. This timer is disabled if the connection is disabled.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Debounce Timeout

Range:	0 to 1000
Default:	0
Description:	<p>This parameter defines the time in seconds for which the PAD waits before implementing the shutdown action (see ALCS and CSD under Connection Options below). If the conditions which would have caused shutdown cease to apply during this period, no action is taken. If the timer is zero, then shutdown occurs immediately.</p> <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Parity

Range:	NONE, ODD
Default:	NONE
Description:	<p>Specifies the parity to be use:</p> <ul style="list-style-type: none"> • NONE: No parity is used. • ODD: All messages sent to X.25 have odd parity. <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Connection Options

Range:	NONE, HDR, ALCSD, CSD, FLOW, USE_ADDR
Default:	NONE
Description:	<p>These options control the behavior of the connection. You can specify one or more options by separating them by “+”.</p> <ul style="list-style-type: none"> • NONE: No options are specified. • HDR: ALP PAD discards all data messages incoming from X.25, in which the constant parts of the IN Header do not match the header of the message. • ALCSD: If you specify this option and the X.25 SVC goes down, then the ALC entity is shut down. • CSD: If you specify this option and the ALC entity goes down, then the associated call is cleared. • FLOW: If the number of free buffers decreases to 20% of its maximum, then flow control is imposed on the receiver. It is released when the number of free buffers reaches 50% of its maximum. If you do not set this option, messages received when there are no buffers available are discarded. <p>■ Note Flow control requests from X.25 are always acted upon, regardless of the setting of this option.</p> <ul style="list-style-type: none"> • USE_ADDR: The address in the received message is used when the message is passed to ALC and address checking is turned off. <p>■ Note You must boot the entity associated with the connection, that is a Port, Interchange, or Terminal, for changes to this parameter to take effect.</p>

Operation and Administration

Introduction

This section provides operation and administration guidelines for ALC protocol support.

The function of the software can be broadly divided into two sections: the ALC Handler section that handles the protocol, and the X.25 to ALC switching component that passes messages between ALC and X.25 via the ALP PAD.

ALC Handler

The ALC Handler implements the ALC protocol and all aspects of data transmission and reception that are a part of the protocol. It delivers ALC message segments to the higher layers of software and shields those layers from the polling protocol.

ALP PAD

In addition to passing messages between ALC and X.25, the ALP (Airline Line Protocol) PAD performs address mapping, character inversion and reversal, and end-to-end control.

Connections are made between ALC entities (lines, interchanges, or terminals) and X.25 virtual circuits. Any data received on a particular ALC entity is transmitted on the connected SVC. Data transmitted on X.25 is inverted and reversed, that is, the lower 6 bits only are inverted and reversed.

ALP PAD functions include:

- Header configuration
- Address translation
- End-to-end control
- Flow control
- Inactivity timer
- Data stream conversion

Message Routing

Connections between the ALC entities and X.25 SVCs are established using:

Outbound Calls

Calls are made using the mnemonic table. For information on configuring your mnemonic table refer to the *Vanguard Configuration Basics Manual* (Part Number T0113).

Inbound Calls

Calls are directed to the ALC entities by the routing table. Each entity registers an entry in the routing table with a name in the following format:

- ALC-*ln* (for line-based connections)
- ALC-*ln_ia* (for interchange-based connections)
- ALC-*ln_ia_ta* (for terminal-based connections)

where:

- *ln* is the port number (the line)
- *ia* is the interchange address
- *ta* is the terminal address

■ **Note**

ia and *ta* must be represented by two digits, that is ALC-7_01_3B is allowed but ALC-5_2_4 is not.

Management and Control

The ALC port is managed and controlled by the Control Terminal Port. Refer to the Vanguard *Configuration Basics Manual* (Part Number T0113) for more information on using the CTP.

The configurable parameters for each line, interchange, and terminal together with the associated statistics screens and reports are listed below.

■ **Note**

Booting any entity will cause all subordinate entities to be booted. This in turn causes all calls associated with the booted entity to be cleared.

Reports (Alarms)

Three sets of reports are generated:

- a) ALC specific reports which relate to options configured for the protocol
- b) ALP Connection specific (the connection of the ALC entity to X.25)
- c) User interaction specific which are generated by the Port Module

■ **Note**

All ALC alarms have this format:

- ALC-<PORT#>[_<IA>[_<TA>]] is the report text format
- <PORT#> is the port number
- <IA> is the interchange address format in hexadecimal
- <TA> is the terminal address format in hexadecimal

ALC Handler Reports

This table lists the reports generated by the ALC Handler. LOW, MED, and HIGH indicate the alarm severity level and <ENTITY> identifies an ALC line, interchange, or terminal.

Alarm Severity Level	ALC Alarm Format	Definition
HIGH	<PORT#>	LINE DOWN
HIGH	<PORT#>	LINE UP
MED	<ENTITY>	FLOW CONTROL IMPOSED
MED	<ENTITY>	FLOW CONTROL RELEASED
HIGH	<IA>	IA ENTERING FAST POLL
HIGH	<IA>	IA ENTERING SLOW POLL
HIGH	<IA>	STOPPED POLLING IA
LOW	<IA>	RESET DISCARDED. ALC has received a Reset command for the specified IA and this IA is not configured to handle Reset commands.

Alarm Severity Level	ALC Alarm Format	Definition (continued)
MED	<IA>	T1 TIMEOUT. The ALC Handler has sent a poll on the specified line and has failed to receive the start of a response within the configured T1 Timeout.
MED	<IA>	T2 TIMEOUT. The ALC Handler has sent a poll on the specified line and has failed to receive a complete response within the configured T2 Timeout.
LOW	<PORT#>	BAD CCC RECEIVED.
MED	<ENTITY>	HOST TIMEOUT. The ALC Handler has not received a poll for this entity within the time specified by the host timeout.
MED	<ENTITY>	HOST HAS STARTED POLLING.
MED	<ENTITY>	MESSAGE DISCARDED, NO CONNECTION AVAILABLE. A message has been received on an ALC entity, but no connection is associated with this entity.

ALP Connection Reports

This table lists the alarms generated by the ALP PAD module. The queues referred to are the message queues within the ALP PAD, not the protocol transmit queues themselves. LOW, MED, and HIGH indicate the alarm severity level and <ENTITY> identifies an ALC line, interchange, or terminal.

Alarm Severity Level	ALP Alarm Format	Error	Reason
MED	<ENTITY>	BUFFER DISCARDED	ALC QUEUE FULL. The queue towards ALC was full.
			X.25 QUEUE FULL. The queue towards X.25 was full.
			ALC BAD WRITE. A write request to ALC failed.
			X.25 BAD WRITE. A write request to X.25 failed.
			ENTITY OFFLINE. The connection was offline.
			BAD HEADER. The received header was invalid.
			BAD ADDRESS. The received ALC address was invalid.
MED	<ENTITY>	LOST <N> MESSAGES IN 60 SECONDS	
HIGH	<ENTITY>	X.25 CALL FAILED	The X.25 call setup failed.

Port Module Reports

This table lists the alarms generated by the ALC Port Control Handler. LOW, MED, and HIGH indicate the alarm severity level and <ENTITY> identifies an ALC line, interchange, or terminal.

Alarm Severity Level	ALP Alarm Format	Reason
HIGH	<ENTITY>	BOOT COMPLETE
HIGH	<ENTITY>	BOOT FAILURE (<REASON>)
HIGH	<ENTITY>	DISABLED
HIGH	<ENTITY>	DISABLE FAILURE (<REASON>)
HIGH	<ENTITY>	ENABLED
HIGH	<ENTITY>	ENABLED FIALURE (<REASON>)
<i>The following reasons are appended where appropriate</i>		
No Port Record		
Port is disabled		
Already disabled		
Already enabled		
No Interchange Record		
Port Record is not ALC		
Interchange is disabled		
Port Subtype change requires node boot		
Terminal not defined		
Feature not supported		
Max frame size change requires node boot		
# leading pad chars change requires node boot		
# trailing pad chars change requires node boot		
No connection defined		
Connection disabled		
# buffers change requires node boot		
Max component per frame change requires node boot		

Statistics

Introduction

Five statistical screens are accessible by selecting Status/Statistics from the Main menu of the 6500^{PLUS} CTP. The figures and tables in this section show screen samples and descriptions.

- “ALC Port (Line) Statistics” section on page 31
- “ALC Interchange Statistics” section on page 35
- “ALC Terminal Statistics” section on page 40
- “ALC Interchange Summary” section on page 42
- “ALC Terminal Summary” section on page 43

■ **Note**

In all of the following screen samples, “n” represents a digit.

ALC Port (Line) Statistics

Introduction

ALC Port (Line) Statistics provide status information about an ALC line. To view these statistics:

Step	Action
1	Select Status/Statistics from the Main menu.
2	Select Detailed Port Stats from the Status/Statistics menu.
3	At the prompt, enter the number of the port you wish to view. Press ENTER. The screen shown in Figure 3 appears. Note that there are two screens associated with this status display. Screen 2 (see Figure 4) is only displayed if there is a connection associated with the line. ■ Note The tables that follow explain the parameters shown on these screens, respectively.

Detailed Statistics- Page 1

Figure 3 shows an example of the first page of the ALC Port Statistics screen:

```

Node:           Address:           Date:           Time:
Detailed ALC Port Statistics: Port 4           Page: 1 of 2

Port State:     ONLINE

Data and Control Summary
                IN                OUT
Frames:         4774019            4580560        Polls: 4580559
Data messages:  193460             193460        GAs: 4580560
Characters:     61913217           56945740      Resets: 0

Discard bad IA: 0                0
Max queue size:                0

Physical Summary
CCC errors:     0                Overlength frames: 0
Signal losses: 0

Eia Summary
                INPUT                OUTPUT
                DTR RTS MB P14      DSR DCD RI CTS
State: Connected (SIMPLE)  H  H  L  L      H  H  L  H

Press any key to continue ( ESC to exit ) ...
    
```

Figure 3. ALC Port Statistics (Screen 1 of 2)

Screen Terms -
Page 1

This table describes the screen terms shown in Figure 3.

Term	Description
Port State	<ul style="list-style-type: none"> • CONNECTING: The line has been enabled by the operator, but polling has not yet been established. • ONLINE: The line is active. • OFFLINE: The line has been disabled by the operator. • PENDING: The line is inactive because of conditions detected by the ALP PAD. The X.25 Virtual Circuit is not active. • TIMEDOUT: “The line is not being polled” message is displayed on poll coerced HPAD lines only. • FLOW CONTROL: The application (ALP PAD) has imposed flow control on the lines.
Data & Control Summary	<ul style="list-style-type: none"> • FRAMES: The number of ALC frames sent and received. • DATA MESSAGES: The number of ALC data messages sent and received. • CHARACTERS: The total number of characters sent and received. This excludes all synchronization characters. • POLLS: The number of poll messages transmitted for a line defined as a TPAD and the number of poll messages received for a line defined as HPAD. • GAs (Go Ahead messages): The number of Go Ahead messages transmitted for a line defined as HPAD and the number received for one defined as TPAD. • RESETS: The number of reset messages transmitted for a line defined as TPAD and the number received for one defined as HPAD. • DISCARD BAD IA: The number of messages processed for which the IA was not defined on this line. • MAX QUEUE SIZE: The maximum number of frames that have been queued for transmission. Valid for TPAD only.
Physical Summary	<ul style="list-style-type: none"> • CCC ERRORS: The number of messages received for which the checksum was invalid. • OVERLENGTH FRAMES: The number of frames received that were longer than the configured maximum. • SIGNAL LOSSES: The number of signal loss events.

**Detailed Statistics-
Page 2**

Figure 3 shows an example of the second page of the ALC Port Statistics screen:

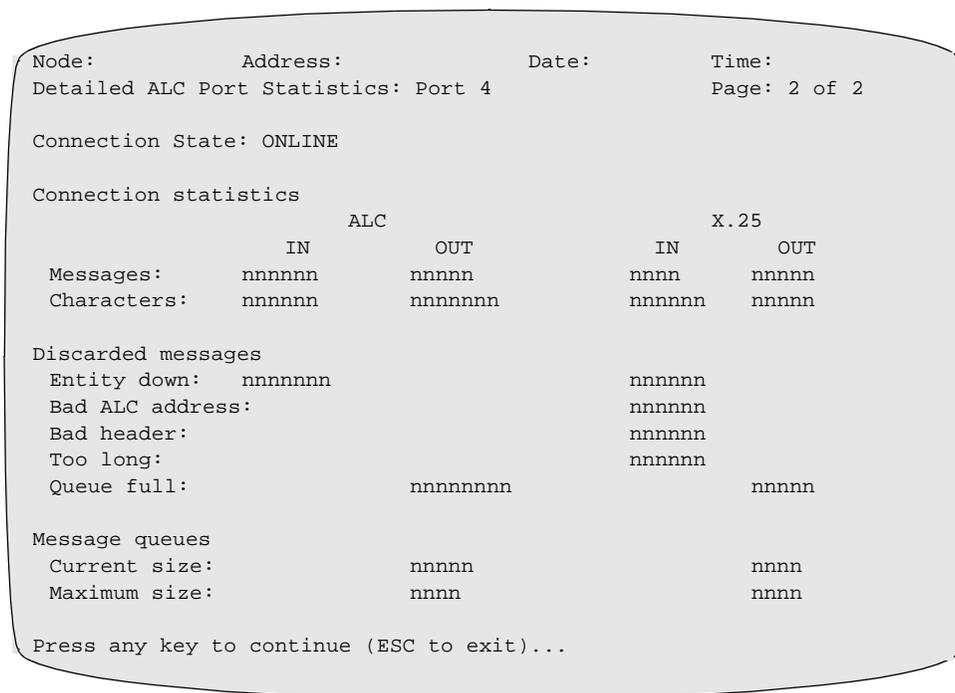


Figure 4. ALC Port Statistics (Screen 2 of 2)

**Screen Terms -
Page 2**

This table describes the screen terms shown in Figure 4.

Term	Description
Connection State	<ul style="list-style-type: none"> • ONLINE: The connection is available for data transfer. • OFFLINE: The connection has been disabled by an operator. • CONNECTING: ALP is attempting to make the X.25 virtual circuit available for use. • INACTIVE: The inactivity timer has expired, so the virtual circuit has been dropped. Data received from ALC will cause the connection to be reestablished. • PENDING: The CSD option has been configured and the ALC entity is currently down; hence, ALP PAD has disabled the X.25 virtual circuit.
Connection Statistics	<ul style="list-style-type: none"> • MESSAGES: The number of messages received from ALC and X.25 and transmitted to ALC and X.25 • CHARACTERS: The number of characters received from ALC and X.25 and transmitted to ALC and X.25.

Term	Description (continued)
Discarded Messages	<ul style="list-style-type: none"> • ENTITY DOWN: The number of messages received for which the destination entity is unable to process the data. • BAD ALC ADDRESS: The number of messages received from X.25 for which the addresses specified do not match those associated with the connection. • BAD HEADER: The number of messages received from X.25 of which the IN Header configured does not match the header present in the messages. • TOO LONG: The number of messages received from X.25 that were discarded because they were longer than the allowable ALC maximum configured. • QUEUE FULL: The number of messages discarded because the outbound message queue was full.
Message Queue	<ul style="list-style-type: none"> • CURRENT SIZE: The number of messages currently queued for transmission. • MAXIMUM SIZE: The maximum size of the transmit queue so far (the high water mark).

ALC Interchange Statistics

Introduction

To view ALC Interchange statistics:

Step	Action
1	Select Status/Statistics from the Main menu.
2	Select Detailed ALC Interchange Statistics from the Status/Statistics menu.
3	At the prompt, enter the number of the port you wish to view. Press ENTER. The screen shown in Figure 5 appears. Two screens are associated with this status display. However, screen 2 is only displayed if there is a connection associated with the line.

Detailed Statistics- Page 1

Figure 5 shows an example of the first page of the ALC Interchange Statistics screen:

```

Node:                Address:                Date:                Time:
Detailed ALC Interchange Statistics: Port 4 IA 01      Page: 1 of 2

Interchange State: ONLINE

Data & Control Summary
Frames:                IN                OUT                Polls:    4589791
Data messages:        4783641    4589792
Characters:            193850     193850            GAs:      4589792
                      62038023    57060534        Resets:   0

Discard bad TA:       0          0
Disabled IA:          0          0
Max queue size:      0          1

General Summary
CCC errors:           0
T1 timeouts:          0
T2 timeouts:          0

Press any key to continue ( ESC to exit ) ...
    
```

Figure 5. ALC Interchange Statistics (Screen 1 of 2)

Screen Terms -
Page 1

This table describes the screen terms shown in Figure 5.

Term	Description
Interchange State	<ul style="list-style-type: none"> • ONLINE: “The interchange is active” is displayed for HPAD and TPAD interchanges configured as NOPOLL only. • OFFLINE: The interchange has been disabled by the operator. • PENDING: The interchange is inactive because of conditions detected by the application (ALP PAD). • FAILED: The line with which this interchange is associated is down. • TIMED OUT: “The Interchange is not being polled” is displayed for HPAD interchanges on non-pollled coerced lines only. • FLOW CONTROL: The application (ALP PAD) has imposed flow control on the interchange. • STOPPED: The line with which this interchange is associated is in the FLOW CONTROL state. TPAD interchanges only. • SLOW POLL: The interchange is in slow poll. • FAST POLL: The interchange is in fast poll.

Term	Description (continued)
Data and Control Summary	<ul style="list-style-type: none"> • FRAMES: The number of ALC frames sent and received. • DATA MESSAGES: The number of ALC data messages sent and received. • CHARACTERS: The total number of characters sent and received. This will exclude all synchronization characters. • POLLS: The number of poll messages transmitted for a line defined as TPAD. The number received for one defined as HPAD. • GAs: The number of Go ahead messages transmitted for a line defined as HPAD. The number received for one defined as TPAD. • RESETS: The number of reset messages transmitted for a line defined as TPAD. The number received for one defined as HPAD. • DISCARD BAD TA: The number of messages processed for which the TA was not defined on this interchange. • DISABLED IA: The number of messages processed for which the interchange was disabled. The IN column is only used for HPAD. • MAX QUEUE SIZE: The maximum number of frames queued for transmission. Valid for HPAD only.
General Summary	<ul style="list-style-type: none"> • CCC ERRORS: The number of messages received for which the checksum was invalid. • T1 TIMEOUTS: The number of T1 timer expirations. This is defined for TPAD only. • T2 TIMEOUTS: The number of T2 timer expirations. This is defined for TPAD only.

**Detailed Statistics-
Page 2**

Figure 6 shows an example of the second page of the ALC Interchange Statistics screen:

```

Node:                Address:                Date:                Time:
Detailed ALC Interchange Statistics: Port 4 IA 01          Page:  2 of 2

Connection state: ONLINE

Connection statistics

                ALC                                X.25
                IN      OUT                        IN      OUT
Messages:      193904  193911                    193911  193904
Characters:    48282096 47896017                    47896017 48282096

Discarded messages
Entity down:                0                0
Bad ALC address:           0                0
Bad header:                0                0
Too long:                  0                0
Queue full:                 0                0

Messages queues
Current size:                1                0
Maximum size:                1                1

Press any key to continue ( ESC to exit ) ...
    
```

Figure 6. ALC Interchange Statistics (Screen 2 of 2)

**Screen Terms -
Page 2**

This table describes the screen terms shown in Figure 6.

Term	Description
Connection State	<ul style="list-style-type: none"> • ONLINE: The connection is available for data transfer. • OFFLINE: The connection has been disabled by an operator. • CONNECTING: The ALP PAD is attempting to make the X.25 virtual circuit available for use. • INACTIVE: The inactivity timer has expired, so the virtual circuit has been dropped. Data received from ALC will cause the connection to be reestablished. • PENDING: The CSD option has been configured and the ALC entity is currently down; hence, ALP PAD has disabled the X.25 virtual circuit.

Term	Description (continued)
Connection Statistics	<ul style="list-style-type: none"> • MESSAGES: The number of messages received from ALC and X.25 and transmitted to ALC and X.25. • CHARACTERS: The number of characters received from ALC and X.25 and transmitted to ALC and X.25.
Discarded Messages	<ul style="list-style-type: none"> • ENTITY DOWN: The number of messages received for which the destination entity is unable to process the data. • BAD ALC ADDRESS: The number of messages received from X.25 for which the addresses specified do not match those associated with the connection. • BAD HEADER: The number of messages received from X.25 of which the IN Header configured does not match the header present in the message. • TOO LONG: The number of messages received from X.25 that were discarded because they were longer than the allowable ALC maximum configured. • QUEUE FULL: The number of messages discarded because the outbound message queue was full.
Message Queues	<ul style="list-style-type: none"> • CURRENT SIZE: The number of messages currently queued for transmission. • MAXIMUM SIZE: The maximum size of the transmit queue so far (the highwater mark).

ALC Terminal Statistics

Introduction

To view ALC terminal statistics:

Step	Action
1	Select Status/Statistics from the Main menu.
2	Select Detailed ALC Terminal Statistics from the Status/Statistics menu. If a connection is associated with the terminal, the screen shown in Figure 7 appears.

```

Node:           Address:           Date:           Time:
Detailed ALC Terminal Statistics: Port nn IA nn TA nn Page 1 of 1

Connection state: ONLINE
Connection statistics

                ALC                       X.25
                IN       OUT              IN       OUT
Messages:      nnnnnnnnnn nnnnnnnnnn  nnnnnnnnnn nnnnnnnnnn
Characters:    nnnnnnnnnn nnnnnnnnnn  nnnnnnnnnn nnnnnnnnnn

Discarded messages
Entity down:           nnnnnnnnnn      nnnnnnnnnn
Bad ALC address:      nnnnnnnnnn
Bad header:           nnnnnnnnnn
Too long:             nnnnnnnnnn

Queue full:           nnnnnnnnnn      nnnnnnnnnn

Message queues
Current size:         nnnn              nnnn
Maximum size:        nnnn              nnnn

Press any key to continue (ESC to exit)...
    
```

Figure 7. ALC Terminal Statistics (Screen 1 of 1)

Screen Terms

This table describes the screen terms shown in Figure 7.

Term	Description
Connection State	<ul style="list-style-type: none"> • ONLINE: The connection is available for data transfer. • OFFLINE: The connection has been disabled by an operator. • CONNECTING: The ALP PAD is attempting to make the X.25 virtual circuit available for use. • INACTIVE: The inactivity timer has expired, so the virtual circuit has been dropped. Data received from ALC will cause the connection to be reestablished. • PENDING: The CSD option has been configured and the ALC entity is currently down; hence, ALP PAD has disabled the X.25 virtual circuit.
Connection Statistics	<ul style="list-style-type: none"> • MESSAGES: The number of messages received from ALC and X.25 and transmitted to ALC and X.25. • CHARACTERS: The number of characters received from ALC and X.25 and transmitted to ALC and X.25.
Discarded Messages	<ul style="list-style-type: none"> • ENTITY DOWN: The number of messages received for which the destination entity is unable to process the data. • BAD ALC ADDRESS: The number of messages received from X.25 for which the addresses specified do not match those associated with the connection. • BAD HEADER: The number of messages received from X.25 of which the IN Header configured does not match the header present in the message. • TOO LONG: The number of messages received from X.25 that were discarded because they were longer than the allowable ALC maximum configured. • QUEUE FULL: The number of messages discarded because the outbound message queue was full.
Message Queues	<ul style="list-style-type: none"> • CURRENT SIZE: The number of messages currently queued for transmission. • MAXIMUM SIZE: The maximum size of the transmit queue so far (the highwater mark).

ALC Interchange Summary

Introduction

To view a summary of the ALC Interchange states:

Step	Action
1	Select Status/Statistics from the Main menu.
2	Select ALC Interchange Summary from the Status/Statistics menu. If a connection is associated with the terminal, the screen shown in Figure 8 appears.

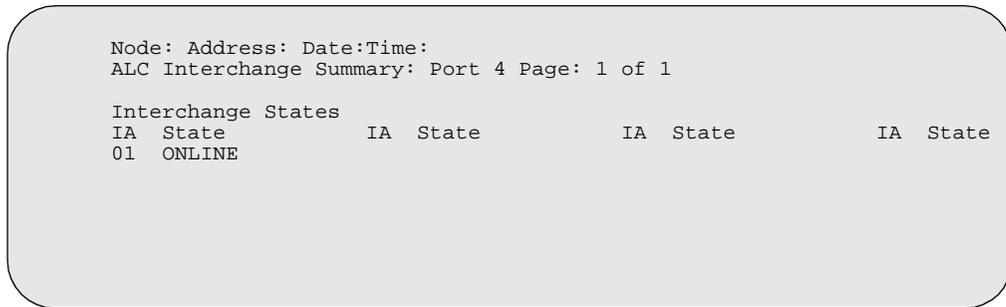


Figure 8. ALC Interchange Summary Screen (1 of 1)

Screen Terms

This table describes the Interchange Summary screen terms.

Term	Description
ONLINE	“The interchange is active” is displayed for HPAD interchanges and TPAD interchanges configured as NOPOLL only.
OFFLINE	The interchange has been disabled by the operator.
PENDING	The interchange is inactive because of conditions detected by the application (ALP PAD).
FAILED	The line with which this interchange is associated is down.
TIMED OUT	“The interchange is not being polled” is displayed for HPAD interchanges.
FLOW CONTROL	The ALP PAD has imposed flow control on the interchange.
SLOW POLL	The interchange is in slow poll.
FAST POLL	The interchange is in fast poll.

ALC Terminal Summary

Introduction

To view a summary of the states of all the terminals explicitly defined on a particular line:

Step	Action
1	Select Status/Statistics from the Main menu.
2	Select ALC Terminal Summary from the Status/Statistics menu. If a connection is associated with the terminal, the screen shown in Figure 9 appears. Note The table that follows explains the parameters shown on these screens, respectively.

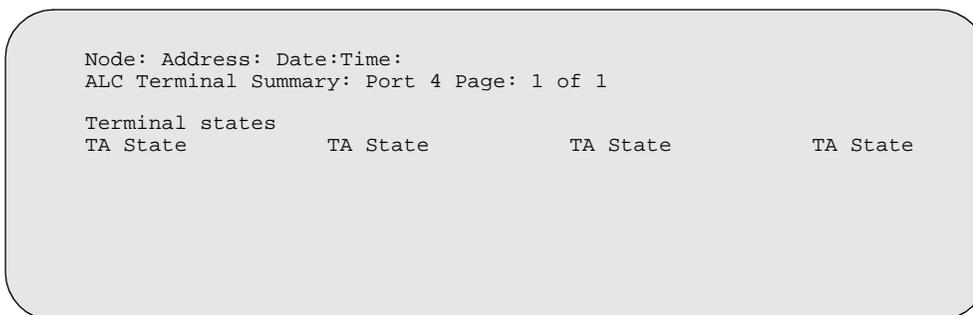


Figure 9. ALC Terminal Summary Screen

Screen Terms

Each of the defined terminals is listed, its address is given in the TA column, and its current state is given in the State column. The values displayed are described below.

Field Value	Description
ONLINE	The terminal is active.
PENDING	The terminal is inactive because of conditions detected by the application (ALP PAD).
FAILED	This terminal's associated interchange is down.

**New ALC
Subsystem Menu
Entries**

This table lists the new menu entries added to the standard 6500 menus by the ALC Subsystem.

<i>New Menu Entry</i>	<i>Entity</i>	<i>Action</i>
EXAMINE	ALC Interchange	Displays the configuration of the specified interchange and connection.
LIST	ALC Interchange	Lists the configuration of all the interchanges and connections on the specified line.
STATUS/ STATISTICS	Detailed ALC Interchange Statistics	Displays the statistics for an interchange and its associated connection.
	Detailed ALC Terminal Statistics	Displays the statistics for the connection associated with the specified terminal.
	Reset ALC Interchange Statistics	Resets the interchange and subordinate terminal statistics and those of the associated connections if there are any.
	Reset ALC Terminal Statistics	Resets the statistics of the connection associated with the specified terminal.
	Interchange Summary	Displays the states of all of the interchanges defined on a line.
	Terminal Summary	Displays the states of all of the terminals defined on an interchange.
CONFIGURE	ALC Interchange	Allows the configuration of an interchange.
	ALC Terminal	Allows the definition of a terminal.
BOOT	ALC Interchange	Boots the specified interchange and all associated terminals and connections.
	ALC Terminal	Boots the specified terminal and the associated connection if there is one.
COPY/INSERT RECORD	Copy ALC Interchange Record	Copies an interchange record and all associated terminals and connections.
DELETE RECORD	ALC Interchange	Deletes an interchange and all associated terminals and connections.
	ALC Terminal	Deletes a terminal and the associated connection.

New Menu Entry	Entity	Action (continued)
PORT/STATION/ CHANNEL CONTROL	Enable ALC Interchange	Enables an interchange, the connection associated with that interchange, and all connections associated with subordinate terminals to the interchange.
	Enable ALC Terminal	Enables a connection associated with a terminal.
	Disable ALC Interchange	Disables an interchange, its associated connections, and all connections associated with subordinate terminals to that interchange.
	Disable ALC Terminal	Disables a connection associated with a terminal.

ASCII to IPARS Translation

This table shows the mapping used when translating the ASCII characters used to specify the Re-enter, Start, and Stop messages on an interchange.

IPARS (HEX)	IPARS char	ASCII char	ASCII (HEX)
00	(null)	^	5E
01	1	1	31
02	2	2	32
03	3	3	33
04	4	4	34
05	5	5	35
06	6	6	36
07	7	7	37
08	8	8	38
09	9	9	39
0A	0	0	30
0B	*	*	2A
0C	CR/NL	;	3B
0D	(EOMi)		
0E	=	=	3D
0F	(GoAhead)	“	22
10	(No-Op)	_	5F
11	/	/	2F
12	S	S	53
13	T	T	54
14	U	U	55
15	V	V	56
16	W	W	57

IPARS (HEX)	IPARS char	ASCII char	ASCII (HEX) (continued)
17	X	X	58
18	Y	Y	59
19	Z	Z	5A
1A	-	-	2D
1B	(cross of lor-raine)	#	23
1C	(space)	(space)	20
1D	(EOMc)		
1E	(SOM)	>	3E
1F	,	,	2C
20	(lozenge)	@	40
21	J	J	4A
22	K	K	4B
23	L	L	4C
24	M	M	4D
25	N	N	4E
26	O	O	4F
27	P	P	50
28	Q	Q	51
29	R	R	52
2A	:	:	3A
2B	<	<	3C
2C	+	+	2B
2D	(EOMu)		
2E))	29
2F	((28
30	\$	\$	24
31	A	A	41
32	B	B	42
33	C	C	43
34	D	D	44
35	E	E	45
36	F	F	46
37	G	G	47
38	H	H	48
39	I	I	49
38	?	?	3F
3B	.	.	2E

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