



Avalanche Emulation Client for 3000 Series Terminals

Version 1.0 User's Guide

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Preliminary

Items Covered:

- *Emulation Client*

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About This Manual

This manual contains information regarding WaveLink’s new wireless network management system environment called “Avalanche”. The purpose of this document is to discuss the installation, configuration, and Avalanche system usage. In addition, information needed to obtain the product is provided. The target audience for this systems manual consists of Information Technology personnel and RF system administrators. For additional information regarding Microsoft configurations described in this manual, please refer to Microsoft Windows document resources.

Conventions

Keystrokes are indicated as follows::

ENTER	identifies a key.
Press A + B	identifies a key sequence. Press and release each key in turn.
FUNC, CTRL, R	identifies a key sequence. Press and release each key independently.
Hold A + B	press and hold the indicated keys while performing or waiting for another function. Used in combination with another keystroke.

Typeface conventions used include:

GUI Screen Text	indicates the name of a control in a GUI-based application or a sub-menu item.
<i>Italics</i>	indicates pop-up window titles, key terms and passwords.
<i>ITALICS</i>	indicates a main menu title.
Terminal	indicates text shown on a radio terminal screen.
<u>URL</u>	specifies a hyperlink to an Internet web site.
<i>Cross-Reference</i>	specifies a reference to another place in the document.

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Quick Start

Hardware/Software Requirements

The following list describes the hardware and software requirements for 3000 Series emulation client installation.

- Any 32-bit Windows Platform (95/98/ME/NT/2000).
- 3000 Series terminals (1000 and 6000 terminals are included in this category).
- Avalanche Management Console (Avalanche Manager) software.
- Avalanche Enabler (3000 Series enablers are included in the Avalanche Manager installation package).
- Avalanche Update Package (Required with DHCP implementations).
- Emulation client - 3000 Series terminals (1000 and 6000 terminals are included in this category).

Installation and Configuration Steps

All the necessary files required to implement a 3000 Series emulation client demo with Avalanche can be found at <http://avalanche.www.roisys.com>. Contact Symbol Technologies, Inc. for licensed emulation client versions.

Acquire the various software packages that is needed:

- Avalanche Management Console software. Refer to the [Avalanche Manager System Manual](#) for more information.
- Terminal Emulation Packages. Select these by the emulation types and terminal models that the application requires. Contact WaveLink Corporation to receive any kits which are needed but can not find on the web site.
- RF Update Kits (1/2 and 11 Mb). These kits contain the most recent radio drivers and firmware and are a compatible set. Due to incompatibilities between different versions of radio drivers and firmware released by the hardware vendors, it is possible to select the correct driver based on the RF protocol and still have an older firmware on the mobile unit which will not communicate. Applying a WaveLink RF Update Kit will assure that compatible versions are used. This kit will automatically load a matching firmware and RF driver into the terminal.

- Avalanche Enabler Update Kit. If using DHCP in a 3000 Series terminal, the Avalanche Enabler Update Kit is needed. It provides WaveLink's DHCP client which is not included with the standard client hex (i.e., Avalanche Enabler). There is a 2Mb and a 11Mb package. This package also contains the latest updates to the Enabler. As new features are added to Avalanche, occasionally an update to the Enabler is needed. By using the update kit, all updates can be performed via the RF.
1. Install the Avalanche Manager software to a designated PC. This software is distributed in two forms. One is a single executable install and the other is broken into three separate files. The latter method is typically used for floppy disk installs.
 - For single executable installs, click on the executable to begin the install.
 - For floppy installs, copy the three files to a temporary directory, click on the each of the executables to extract the contents, and execute the setup.exe program.
 2. Add serial ports within the Avalanche Manager. Do this in order to prepare to download Avalanche Enablers to the 3000 Series terminals. Once the Manager is installed and the PC has restarted (if required), the Avalanche Manager will open (if the run the Manager on startup option wasn't selected, then run it now). When the Avalanche Manager is executed for the first time, a dialog box giving the option of automatically detecting and configuring available com ports is displayed. To add ports the Advanced Access password, *access*, is required. To toggle Advanced Access mode later, select *AdvancedAccess* from the main menu or press Control-F2 anywhere in the main window.
 3. Install *software packages* onto the Avalanche Manager. Click on the first emulation client package or support package (AVA3 Support package, for example). Follow the installation until complete and then repeat for any other packages needing to be installed. The Avalanche Manager can either be running or shut down at this time. Each time a kit is installed, the console will automatically start up and display dialog boxes leading the installer through placing the newly installed kits into the correct site profile, etc.

Software packages can safely be installed for multiple types of terminals. Each package knows what terminal type it has been designed for and will not download to the wrong terminal type.

After installing a software package, to assign it to a different site profile or *software collection*, simply mark the package for copy and paste as needed. A *software collection* can be supplied with a "selection criteria" which will restrict which terminals will receive software from that collection. As noted however, no action is necessary to simply keep each software package from downloading to the wrong terminal model. For many users, it may be simplest to install all of the software packages into a single, unrestricted collection and move them around later if needed.

-
4. Load each 3000 Series terminal with the Avalanche Enabler. The Avalanche Enabler allows the RF terminal to automatically receive other software packages and configurations from the Management Console. The first time a terminal receives the Avalanche Enabler, it needs to be installed per the usual method for that terminal type (typically a hex file download.) After that, all software (including updates to the Avalanche Enabler itself) can be downloaded directly over the RF or, optionally, over a serial link.

For a 3000-series terminal (including the 6140, 6840, 6940 or any others which still use the 3000 internals), the Enabler is downloaded via a hex file (AVA3*.HEX). Any hex utility can be used but a very efficient hex downloader has been incorporated into the avalanche console. To access this utility, select *Download* from the *HexFiles* pull down menu option. (**IMPORTANT NOTE:** The null modem cable used must not block or loop back DSR since this is used by the client to detect the presence of the Management Console. To be safe, the cable and/or null-modem adapter should be a *full* null modem.)

Once the download dialog box appears, browse and select the hex file from the client sub-directory (use one of the *ava3*.hex* files for all series-3000 terminals.) For more details on choosing the hex file or custom configuring the hex file, see the file *readme.txt* inside *ava3kit.zip* (also in the Clients sub-directory.)

Note: WaveLink offers a 32-bit WinHex Utility to download this initial client. This hex download utility uses a new flow control method designed by WaveLink to allow downloads at 38400 baud *without* requiring the terminal to turn on flow control. This allows a user to download to multiple terminals simultaneously without having to drop to 19200. Contact WaveLink at sales@roisys.com for details.

Perform a command boot on the RF terminal and run the Program Loader. Match the port settings on the terminal to those displayed within the Avalanche Manager Download dialog box and begin the download. The Console will have a *Download* button which will remain grayed out until the terminal is ready. When it is enabled, press it to start the download.

Once the download is complete, perform a cold-boot on the terminal. If it is left in the cradle at this time, it will contact the console serially, otherwise use the following steps to allow the terminal to receive the software packages over the RF.

Note: If downloading packages serially, there is NO need to boot the terminals one at a time; they will coordinate use of the serial connection automatically.

5. Configure the terminal for network use after booting the terminal. There are two main methods for this. One method is setting up an IP Configuration Profile within the Avalanche Manager. This method is explained in the Avalanche Manager System Manual. The second method is a manual method. In this case, after the cold boot, the network configuration utility will automatically come up on the RF terminal. Navigate through the menus, inputting the appropriate information for proper wireless communications. The following fields are provided.
-

- Terminal IP Address. Four options are supported.
 - Manually key in the network information on the RF terminal. BOOTP.
 - Avalanche Manager assigns IP Addresses: See IP Configuration Profiles under the Avalanche Manager Client Management tree view.
 - DHCP: Press CTRL, N to select this option. AVA3 support package is required.
 - BOOTP: Press CTRL, N again to select this option.

Note: Use CTRL, N and CTRL, P to navigate through IP Address options.

- IP Router.
 - IP Netmask.
 - Domain Name. DNS is supported.
 - Name Servers. Fields for up to three name servers.
 - ESS ID (Network ID).
 - Console IP. IP address of Avalanche Management console.
 - Host Profiles. Capable of configuring multiple Host Profiles on each mobile unit. (Only available after a WaveLink emulation client is downloaded and executed.)
6. Configure applications as desired. WaveLink emulation packages provide a large number of configurable options. With Avalanche, these options can be viewed or modified directly from the Management Console. This can be done before the terminals first get the software, or it can be done at any time later and each terminal will automatically receive the updates. After configuration, enable the package so that it can be downloaded (right-click on it and select *Enable Package*.)

To configure a software package, right-click on it in the console's Tree View and select *Configure Package*. A sub-menu will appear with the options available for that package. WaveLink emulation packages allow multiple host profiles, as well as a large selection of terminal configuration parameters.

7. Cold Boot the terminal. The terminal will connect to the Avalanche Manager and retrieve the software packages which have been installed and which are appropriate for the terminal type. After the download is complete, select an application to run from the application menu.

Note: After selecting an application, a future warm-boot will take the user directly back to that application again. To select another application to run, cold-boot the terminal to be presented with the application menu again.

That's it! Use the Configure Package context menu for any emulation client software package to adjust the settings for any package. On most terminals, use FUNC, CTRL, R to edit network settings or host profiles.

Avalanche Enabler Configuration

The *Avalanche Enabler* is the software that enables an RF terminal to receive *software packages* and configuration updates from an Avalanche Manager. This chapter covers the configuration and use of the *Avalanche Enabler* and assumes that it has already been installed onto the terminal. For information on downloading the Avalanche Enabler, installing the Avalanche Manager, or determining terminals supported within this environment, [see http://www.roi-sys.com/avalanche/avasteps.html](http://www.roi-sys.com/avalanche/avasteps.html). Steps to access multiple applications are presented within this chapter. Within a local network segment, the minimum configuration requirements for the Avalanche Enabler are:

- RF Network ID or ESS_ID
- Terminal IP Address
- IP Netmask

Enabler Configuration Overview

1. Use the Avalanche Manager's IP Configuration Profile or access *AVALANCHE ENABLER CONFIGURATION* menu on the RF terminal (See *Accessing the Avalanche Enabler Configuration Menu on page 8*).
 2. Select the method to use to configure the terminal's IP Address. The four methods are:
 - a. DHCP - The DHCP client within the Avalanche Enabler can acquire the Terminal IP Address, Subnet, Router IP Address and DNS (Domain Name System) information via RF link from a DHCP server. For Series 3000 terminals, the Avalanche update software package is required. See *DHCP on page 9* for implementation details.
 - b. BOOTP - The Terminal IP Address may be acquired by way of a serial or RF link from the BOOTP server. See *BOOTP on page 11* for implementation details.
 - c. Avalanche IP Pooling - An IP Address Pool must be configured on the Avalanche Manager. The IP Address may be acquired from the Avalanche Manager via a serial link. See *IP Address Pools on page 12* for implementation details.
 - d. Manual Entry - Key in the Terminal IP Address within the Terminal IP Address field. See *Manual Entry on page 12* for implementation details.
 3. Configure additional terminal IP information such as the IP Netmask, Router IP Address, and Domain Name System (DNS) information (Refer to *Configuring the DNS on page 13* section for details). If using DHCP or IP Configuration Profiles, all these items may be acquired from the DHCP server or from the Avalanche Manager.
-

4. Enter the RF Network ID (i.e., ESS_ID). Refer to *Configuring Radio Parameters on page 14* section for details.
5. Input the IP Address of the Avalanche Manager. See *Avalanche Manager Assignment on page 14*. The RF terminal will send a broadcast across the local segment to find an Avalanche Manager. This occurs each time the RF terminal boots when an IP Address for the Avalanche Manager is not configured in the *Console IP* field.
6. Enable an emulation software package for use with the Avalanche Enabler. This can be done through acquiring advanced access, right clicking a software package, and selecting *Enable Package*. For additional information on software packages, see *Avalanche Manager Help* or *Avalanche Manager System Manual*.
7. Warm or cold boot the mobile unit to allow the Avalanche Enabler to receive software packages from the Avalanche Manager.
8. If applicable, switch between multiple applications loaded within the RF terminal. See *Exiting the Avalanche Enabler Configuration Menu* for details.

Configure Terminal using IP Configuration Profile

This method allows the user to configure RF terminals with the necessary configuration parameters using a serial port on the Avalanche Manager. Terminals intended for use with DHCP, BOOTP, or Avalanche IP Pooling can be configured from the Avalanche Manager with this feature. Use these steps to configure terminals from the Avalanche Manager:

1. Select IP Configuration Profiles from the *Tree View* of the Avalanche Manager. If there is no plus sign in front of the IP Configuration Profiles icon, create a new IP Configuration Profile, otherwise, click on the plus sign to use a defined profile.
2. Click on the IP Configuration Profile to gain access to the Client IP Configuration Profile. See Figure 2.1.

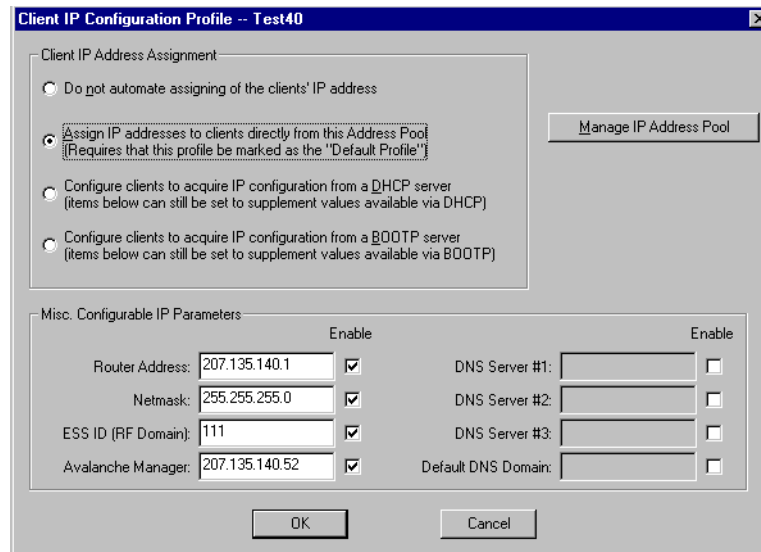


Figure 2.1 Client IP Configuration Profile

3. Select a radio button within the Client IP Address Assignment box to specify how the terminals are to receive their IP Addresses. When Do Not Automate Assigning of the Client's IP Address is selected, terminals are configured manually at the terminal. Parameters provided by a DHCP server take precedence over parameters specified within the Misc. Configurable IP Parameters section. To avoid future confusion determining what configuration parameters are in use, do not enter values for items provided by the DHCP server in the Misc. Configurable IP Parameters section. If choosing the IP Address Pool option, use the following steps.
 - a. Click the Manage IP Address Pool button to add an IP Address range when using Avalanche IP Address Pool feature.
 - b. Select the Add button on this dialog box to add a single IP address or a range. A range can be specified by providing the first and last addresses in the range, separated by either a space or a dash.

To release IP address from a mobile unit, select one or more from the list and select the Release button.

To remove addresses, select one or more from the list and select the Remove button . When removing IP Address entries, Windows selection conventions are supported by this list box. Common selection conventions are described here.

 - Press and hold the *Ctrl* key and click on specific non-contiguous IP Address entries.
 - Press on the first entry and then hold the *Shift* key and click on the last entry of a contiguous block of IP Addresses.
4. Enter the Misc. Configurable IP Parameters as needed.

5. Press OK on the *Client IP Configuration Profile* dialog box to save changes.
6. Set the IP Configuration Profile as the default profile when the IP Address is to be received from the Avalanche Manager, a DHCP server, or a BOOTP server.
7. Right-click the IP Configuration Profile to enable the profile.
8. Boot the terminal within a cradle that has a serial connection to the Avalanche Manager.

Accessing the Avalanche Enabler Configuration Menu

Access to the *AVALANCHE ENABLER CONFIGURATION* can be achieved in one of two ways:

1. When the Avalanche Enabler is first installed and the terminal is booted (coldbooted in the case of a series 3000 terminal), the OPTIONS menu appears as shown in Figure 2.2. Select the *Configure IP* menu item and press ENTER.

```
No applications
found
Options
Configure IP
```

Item 1 of 1

Figure 2.2 Options Menu

2. Press FUNC, CTRL, R from within a Telnet Client application. At the password prompt, enter *system*.
3. Press *Y* to confirm.

Navigating the Avalanche Enabler Configuration Menu

The *AVALANCHE ENABLER CONFIGURATION* menu is displayed on the RF terminal in the manner shown in Figure 2.3 .

```
CONFIG MENU
Network Config
Radio Parameters
Host Profiles
Avalanche
Save Exit
Abort Exit
Item 1 of 6
```

Figure 2.3 Avalanche Enabler Configuration Menu

Use the following keys to move around the *AVALANCHE ENABLER CONFIGURATION* menu (i.e., Config Menu) screens:

Terminal Key	Function
FUNC, 1	Context-sensitive help for valid keys
UP ARROW/DOWN ARROW	Move between entry fields on the screen
LEFT ARROW/RIGHT ARROW	Move within the current entry field
BKSP	Backspace in the entry field
CTRL + D	Delete a field
ENTER	Exit and keep form changes
CTRL + N	Next option (within certain fields)
CTRL + P	Previous option (within certain fields)
CTRL + S	Save values
CTRL + X	Abort changes and exit
CLR	Abort changes and exit

Table 2.1 Avalanche Enabler Configuration Menu Conventions

Note: Saving changes within a form using the ENTER key or CTRL + S still requires the Save Exit function or CTRL + S be executed from the main *CONFIG MENU* to save all changes made during a configuration session.

Terminal IP Configuration

DHCP

The WaveLink DHCP client includes full support for the configuration of the Terminal IP Address, IP Netmask, Router IP Address, Domain Name, multiple DNS server entries etc. In addition, the Telnet Client emulation *software packages* support release renewal. Follow the steps outlined in *Configuring DHCP on page 10* to use DHCP (Dynamic Host Configuration Protocol) with the Avalanche Enabler. Due to limited resources within the Series 3000 terminals, perform the steps outlined in the *DHCP Preparation for Series 3000 Terminals* section before continuing with the *Configuring DHCP* section.

DHCP Preparation for Series 3000 Terminals

1. Install the AVA3 update package on the Avalanche Manager when using Series 3000 terminals. Place the Series 3000 terminal in a cradle that is connected to the Avalanche Manager. This update can not be acquired over the RF because the terminal does not have an IP Address assignment at this time.
2. Boot the Series 3000 terminal while it resides in the cradle to acquire the update package from the Avalanche Manager.

Configuring DHCP

As was mentioned, DHCP can be configured with the Avalanche Manager. It can also be configured manually. To set up DHCP from the mobile unit, perform the following.

1. Access the *AVALANCHE ENABLER CONFIGURATION* menu (See *Accessing the Avalanche Enabler Configuration Menu on page 8*).
2. Select Network Config from the *CONFIG MENU* and then Terminal IP to configure DHCP.
3. Use CTRL + N or CTRL + P to choose the DHCP option at the terminal within the Terminal IP Address field. See Figure 2.4. If the update package has not been installed, a warning message appears on the RF terminal when the DHCP option is selected.

```
Terminal IP Address:
DHCP
IP Router:
0. 0. 0. 0
IP Netmask:
0. 0. 0. 0
```

F1 - Help

Figure 2.4 Terminal IP with DHCP Config

4. Press CTRL + S to save the form and return to the *IP CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *IP CONFIG MENU* menu.
5. Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.
6. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

Note: The terminal needs to be rebooted to effect the changes. As the terminal boots the following information will appear on the RF terminal screen just before the TCP/IP stack is loaded.

```
ROI DHCP VER X.XX
Waiting for DHCP...
```

Figure 2.5 DHCP Terminal Text

- The RF terminal sends the *Waiting for DHCP* broadcast request up to four times. If a DHCP server does not respond, the RF terminal will display the message shown here after the TCP/IP stack attempts to load.

```
FATAL: Unable to
determine this
station's IP
address.
```

```
Strike a key when
ready . . .
```

Figure 2.6 IP Address not Assigned via DHCP

- If the message displayed in Figure 2.6 appears, ensure that the AVA3 update package has been installed on the terminal via a serial connection. When AVA3 package is found on the terminal, verify TCP/IP settings and DHCP server functionality or consider acquiring a static IP Address.

BOOTP

BOOTP address assignment is included directly in the Avalanche Enabler. Using this method, the RF terminal can acquire the Terminal IP Address from the BOOTP server. BOOTP can be configured with the Avalanche Manger. It can also be configured manually. To set up DHCP from the mobile unit, perform the following.

- Access the *AVALANCHE ENABLER CONFIGURATION* menu (See *Accessing the Avalanche Enabler Configuration Menu on page 8*).
- Select Network Config from the *CONFIG MENU* and then Terminal IP.
- Use CTRL + N or CTRL + P to choose this option at the terminal within the Terminal IP Address field.

```
Terminal IP Address:
BOOTP
IP Router:
0. 0. 0. 0
IP Netmask:
0. 0. 0. 0
```

```
F1 - Help
```

Figure 2.7 Terminal IP with BOOTP Config

- Press CTRL + S to save the form and return to the *IP CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *IP CONFIG MENU* menu.
- Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.

6. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

IP Address Pools

IP Address Pools use configured IP ranges from the Avalanche Manager to assign an IP Address to an RF terminal via a serial link. IP Pools are configured using the Avalanche Configuration Profiles menu item on the Avalanche Manager. Refer to Avalanche Manager Help or Avalanche Manager System Manual to add an IP Address Pool. Use the following steps to assign IP Addresses via the Avalanche Manager's IP Pooling feature:

1. Connect the RF terminal to a serial connection or cradle that is attached to the Avalanche Manager. The Avalanche Enabler must already be loaded in the RF terminal.
2. Add IP Address Pools on the Avalanche Manager.
3. Disable all software packages that would service the terminal. This is done because it is more efficient to download software via the RF than the cradle. Refer to Avalanche Manager Help or Avalanche Manager System Manual if performing firmware changes in the RF terminal.
4. Boot the terminal. The terminal should still be connected serially to the Avalanche Manager. The terminal acquires the IP Address from the Avalanche Manager. If the IP assignment fails, a message similar to the one seen in Figure 2.8 is displayed after the TCP/IP stack attempts to load. Verify communications or consider manually assigning an IP Address.

```
FATAL: Unable to
determine this
station's IP
address.
Strike a key when
ready . . .
```

Figure 2.8 IP Address not Assigned

5. Enable software packages that will service this terminal.

Manual Entry

The Terminal IP Address, IP Router, and IP Netmask, and multiple DNS server entries may be keyed or scanned into the RF terminal. Contact WaveLink Corporation for more information on terminal configuration bar codes. To configure these parameters:

1. Access the *AVALANCHE ENABLER CONFIGURATION* menu (See *Accessing the Avalanche Enabler Configuration Menu on page 8*).

2. Select Network Config from the *CONFIG MENU* and then Terminal IP to display:

```

Terminal IP Address:
0. 0. 0. 0
IP Router:
0. 0. 0. 0
IP Netmask:
0. 0. 0. 0

```

F1 - Help

Figure 2.9 Terminal IP Config Screen

Note: Changes made to the Network Config will require a terminal warm boot for changes to take effect.

3. Enter the Terminal IP Address and IP Netmask. If the RF terminal will be communicating across routers to reach the host machine, input the Router IP Address. Refer to *Configuring the DNS* section for DNS setup.
4. Press CTRL + S to save the form and return to the IP *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the IP *CONFIG MENU* menu.
5. Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.
6. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

Note: The Save Exit option or CTRL + S is required at the *CONFIG MENU* to permanently save parameters changed.

Configuring the DNS

Use this menu option if the network uses the Domain Naming System (DNS).

To configure the DNS:

1. Select Network Config and then choose Name Servers from the *IP CONFIG MENU*. The terminal displays:

```

Domain Name:

Name Servers:
0. 0. 0. 0
0. 0. 0. 0
0. 0. 0. 0

```

F1 - Help

Figure 2.10 Terminal DNS Config

2. Enter the domain name for the server.
3. Enter up to three name server IP addresses.
4. Press CTRL + S to save the form and return to the *IP CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *IP CONFIG MENU* menu.
5. Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.
6. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

Note: The Save Exit option or CTRL + S is required at the *CONFIG MENU* to permanently save parameters changed.

Avalanche Manager Assignment

This screen allows the user to enter an IP Address for the Avalanche Manager. The RF terminal will communicate with this Avalanche Manager to receive software updates, configuration information, etc. If this parameter is not configured, the RF terminal will perform a broadcast across the local segment and attach itself to the first Avalanche Manager that hears it. The RF terminal will perform this broadcast each time it is booted.

To manually configure a Avalanche Manager IP Address:

1. Select *Avalanche* from the *CONFIG MENU*.
2. Enter the IP Address of the Avalanche Manager.

```
Console IP:  
123. 123. 23. 21
```

Figure 2.11 Console IP Configuration

3. Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.
4. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

Note: The Save Exit option or CTRL + S is required at the *CONFIG MENU* to permanently save parameters changed.

Configuring Radio Parameters

Terminals require a Network ID (i.e., *ESS_ID*) to communicate with S24 APs on the network. The terminal stores up to three Network IDs. Any of these network IDs can be made active, however, only one can be active at a time.

To configure radio parameters:

1. Select Radio Parameters.

```
RF Network ID:
Active> 1: 101
        2:
        3:
```

```
Diversity: Y
Power MGMT: Y
```

Figure 2.12 Terminal Radio Config

2. Select the field marked as Active (see Figure 2.12).
3. Type in the value that corresponds to the APs in use.
 - a. For terminals using the Spring protocol, valid Net_ID values are: 101 to 1FE (Hexidecimal).
 - b. For terminals using the 802.11 protocol, the Net_ID can be up to 32 characters in length. Zero through nine and A through Z are valid character entries.
4. Press CTRL, A to mark it as the active ID.
5. Specify if terminal uses two antennas (i.e., diversity). The default is No.
6. Indicate if terminal should operate with Power Management. Select Y to enable Power Management (i.e., Power Save Polling mode) or N to disable Power Management (i.e., Continuously Aware Mode). The default is Yes. Consult your Symbol representative before changing this parameter from its default setting.
7. Press CTRL + S to save the form and return to the *RADIO MENU* menu. Use CTRL + X to abort the changes and return to the *RADIO MENU* menu.
8. Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.
9. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

Note: The Save Exit option or CTRL + S is required at the *CONFIG MENU* to permanently save parameters changed.
10. For radio connection problems, see *Terminal Info* section to view diagnostic information.

Terminal Info

Select this option to display the terminal radio card MAC address, the firmware version, and access the diagnostics screens. Press the D key within the Terminal Info feature to access Spectrum24 radio diagnostics. To exit, use the X key. Below is a sample view of some of the diagnostic parameters available when using this feature.

```
Associated
Number AP Avail : 1
Number Assoc   : 0
Failed Assoc   : 0
Failed Respons : 0
RX Beacons     22309
Missed Beacons: 0%
1 Next Prev Reset X
```

Figure 2.13 Terminal Radio Diagnostics

Exiting the Avalanche Enabler Configuration Menu

When completing a configuration session, perform step one or two.

1. At the *CONFIG MENU*, press CTRL + S or select *Save Exit* to save all parameters changed.

Note: The *Save Exit* option or CTRL + S is required at the *CONFIG MENU* to permanently save parameters changed.

2. At the *CONFIG MENU*, press *Abort Exit* or CTRL + X to cancel all changes.

Host Profiles

Host Profiles can be configured from either the *CONFIG MENU* or the Avalanche Manager. Host Profile configuration from the *CONFIG MENU* is not available until Telnet Client software packages are installed on the RF terminal. Once a Telnet Client software package is installed, it must be the current active application before the host profile configuration will be allowed. See *Configuring Host Profiles from Config Menu on page 21* or *Configuring Host Profiles from the Avalanche Manger on page 22*.

Configure Avalanche Enabler Using Buildhex.bat

The Avalanche Enabler kit provides the ability for the system administrator to pre-configure the network parameters for Series 3000 terminals before the Avalanche Enabler hex file is loaded in the RF terminal. The Avalanche Enabler kit resides in the \Program Files\Roissys\Avalanche\Client subdirectory when the default install path for the Avalanche Manager is used. Refer to the `ava3.txt`, located in the same directory, for details on using this feature.

Avalanche Emulation Client Configuration

WaveLink's emulation clients come in a variety of software packages, providing 5250, 3270, VT and/or HP terminal emulations. In addition, the emulation clients are divided into two categories: Standalone clients (a.k.a., "TN" clients), and those that operate through a Network Controller gateway a.k.a., "NC" clients). Most of the information in this chapter applies to all WaveLink 1000, 3000 and 6000 Series emulation clients, though some configuration options and menus will vary. These variations will be noted in this document.

The emulation client software packages are distributed as executables. In the recent past, each distinct 3000 series terminal required its own software package, now there are software packages targeted for the entire 3000 series product line. The available products are as follows: a package for 5250/3270 TN emulation clients, a package for VT/HP TN emulation clients, one for 5250/3270 NC emulation clients, and one for VT/HP NC emulation clients. There is also a all-in-one (5250/3270/VT/HP) TN package available. See <http://avalanche.roi-sys.com> for a list of 3000 series terminals supported and demonstration software. Proceed to *Emulation Client Installation Overview on page 19* for Emulation Client software package installation.

Emulation Client Installation Overview

This is a summary of the steps needed to successfully install and configure an Emulation Client software package with the Avalanche environment. Refer to the other sections in this chapter for additional details.

1. Acquire the desired Telnet or NC Emulation Client software package from WaveLink Corporation or your preferred reseller.
2. Execute the software package on the Avalanche Manager PC to begin installation. The Avalanche Manager must have been installed but it does not need to be running at this time.
3. Enter the installation key when prompted. This is obtained with the software when sold or when a demonstration period is arranged.
4. Select a site profile to install to when prompted. The current profile is selected by default. Select or key in an alternate if desired.
5. Choose the software collection to which this software package will belong when prompted. The default collection is sufficient for most needs though an alternate can be selected or keyed in if desired. Choose the software collection to which this software package will belong. A message will appear indicating that the software package must be enabled on the Avalanche Manager to become active.

6. Select Client Management icon on the Management Console Tree View and expand it by clicking on the plus icon. Expand the Software Collections icon and choose the software collection to which the software package was installed.
7. Right-click on the software package to create a Host profile. Select *Configure Package* from the context menu, and then choose *Host Profiles* from the next context menu. Please refer to *Configuring Host Profiles from the Avalanche Manger on page 22* or *Configuring Host Profiles from Config Menu on page 21* for details.
8. Configure the various emulation specific parameters for a given emulation client. To access this, right click on the software package, select *Configure Package*, and then choose *Emulation Parameters* from the context menu. Refer to *Emulation Configuration on page 27* for additional information on the many parameters that can be configured at this time.
9. Right click on the software package to enable it. Advanced access is required.
10. Download the software package to the terminal. With most terminal types, an update can be triggered by booting the terminal. Once a Telnet Client software package is downloaded to the RF terminal's disk, it is ready to communicate with the desired host.
11. Right click on a terminal within the Avalanche Manager List View and select Detailed Client Controls from the context menu. The package names currently residing in the terminal are displayed.

Context Menu for Emulation Client Software Packages

Right click on an Emulation Client software package from the Avalanche Manager to access its context menu. This context menu contains the items shown in Figure 3.1.

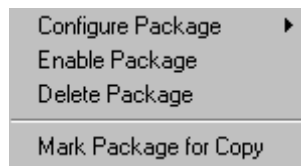


Figure 3.1 TN Client Context Menu

When an Emulation Client software package is installed on the Management Console, it is disabled (i.e., On Hold) at default. To display the software package status, click on the software package and its status will show in the Summary View on the Avalanche Manager. A Telnet Emulation Client software package must be enabled (i.e., Active) for the software package to download to the RF terminal(s).

The *Configure Package* submenu displays the configuration utilities associated with a Telnet Client software package. There are several utility programs available for the Emulation Client software packages. They are:

- Host Profiles. Refer to *Configuring Host Profiles from the Avalanche Manger on page 22*.

- Emulation Parameters. Refer to *Emulation Configuration on page 27*.
- A Localization Utility. Refer to *Localization Utility on page 35*.

Configuring Host Profiles from Config Menu

1. Access the *AVALANCHE ENABLER CONFIGURATION* menu (See *Accessing the Avalanche Enabler Configuration Menu on page 8*).
2. Select *Host Profiles* from the *CONFIG MENU*. The following screen will appear.

```
CONFIG HOST
Charl i e
```

Item 1 of 12

Figure 3.1 Config Host Screen for Selection of Host Profiles

3. Select a current Host Profile or press CTRL, A to create a new profile. Press CTRL, D to delete the highlighted profile. A screen similar to Figure 3.2 will appear.

```
Host Address:
```

```
Host Profile Name:
```

```
Port: 23
```

```
Emulation Type:
```

```
IBM-5251-11
```

```
F1=Help F2=Next Page
```

Figure 3.2 Host Profile Configuration Screen

Note: The terminal stores up to 12 Host Profiles.

4. Enter in the IP address of the host in the *Host Address:* field.
 - a. If using a NC client, the IP address field should point to the network controller.
 - b. If DNS (Domain Name Server) is used, enter the name representing the host in the Host Address field instead of the host IP address.
5. Enter an alphanumeric name for the *Host Profile Name:* field. If no name is entered, the IP address entered into the *Host Address:* field will be displayed on the *CONFIG HOST* screen.
6. Enter the port number. The default port for telnet sessions is 23. The Telnet port for the NC client has to be 8892.
7. Press CTRL, N (Next) and CTRL, P (Previous) in the *Terminal Type* field to select terminal type or enter a user-definable type. This depends on what the host expects as a proper terminal type.

For TN3270/5250 emulations, the choices are:

5250 Emulation IBM-5251-11
3270 Emulation IBM 3278
IBM 3279-2
IBM 3279-2-E

Note: The default type for TN3270/5250 is *IBM-5251-11*.

For TNVT/HP emulations, the choices are:

HP Emulation HP
VT Emulation VT100
VT220

Note: The default type for TNVT/HP is *VT100*.

8. Set up the Workstation ID (5250 only) or VT/HP Auto login and/or Telnet Negotiation String (VT/HP only). For further information on setting up a Workstation ID, see *5250 Workstation ID on page 24*. For further information on setting up a VT auto login, see *VT/HP Auto-Login on page 25*. For further information on setting up a Telnet negotiation string, see *VT/HP Telnet Negotiation String on page 26*.
9. Press CTRL + S to save the form and return to the *CONFIG HOST* menu. Use CTRL + X to abort the changes and return to the *CONFIG HOST* menu.
10. Press CTRL + S to save the form and return to the *CONFIG MENU* menu. Use CTRL + X to abort the changes and return to the *CONFIG MENU* menu.
11. At the *CONFIG MENU*, press CTRL + S or select Save Exit to save all parameters changed during the configuration session.

Configuring Host Profiles from the Avalanche Manger

1. Open the Avalanche Manager and navigate to the software package within the Tree View where the Host Profile is to be configured.
2. Right mouse click on the software package and select Configure Package. Select Host Profiles from the resulting context menu. See Figure 3.3. A screen such as Figure 2.4 will then appear.

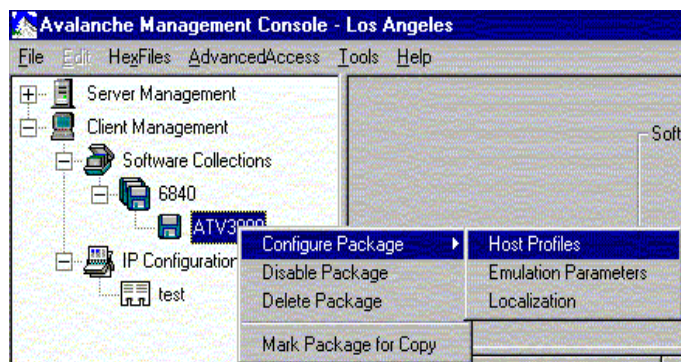


Figure 3.3 Selecting Host Profile Utility from Avalanche Manager

3. Click on New create a new profile or click on Modify to edit the profile listed in the *Host Profile Name* box.
4. Fill in the fields with the appropriate information.
 - a. Fill in a alphanumeric name for the host. If left blank, the IP address of the host will be listed.
 1. If using a NC client, the IP address field should point to the network controller.
 2. If DNS (Domain Name Server) is used, enter the name representing the host in the Host Address field instead of the host IP address.
 - b. Fill in the IP address of the host.
5. Enter the port number. The default telnet port is 23. The Telnet port for the NC client has to be 8892.
 - a. Select the appropriate emulation type that the host expects.
 1. Use the table below to determine which terminal type should be used. Note also that the 5250/3270 emulations are normally contained in a separate software package from the VT/HP emulations. While on the Emulation Type field, CTRL + N will select the next emulation type and CTRL + P will show the previous emulation type.

Terminal Type	Emulation Supported
<i>IBM-5251-11</i>	5250
<i>IBM-3278-2</i>	3270
<i>IBM-3279-2</i>	3270
<i>IBM-3279-2E</i>	3270
<i>VT100</i>	VT100
<i>VT220</i>	VT220
<i>HP</i>	HP
<i>ROI-BLOCK</i>	NC Emulation Client

Table 3.1 Terminal Emulation Types

- b. Set up the Workstation ID (5250 only) or VT/HP Auto login and/or Telnet Negotiation String (VT/HP only). For further information on setting up a Workstation ID, see *5250 Workstation ID on page 24*. For further information on setting up a VT auto login, see *VT/HP Auto-Login on page 25*. For further information on setting up a Telnet negotiation string, see *VT/HP Telnet Negotiation String on page 26*.
6. Click on Save to save the Host Profile or Abort to cancel.
7. Click OK to save all changes and exit the utility

Note: This screen must be closed in order for the terminal to download the changes.

8. Right click on the software package to ensure the package is enabled. If it is not, the terminal will not download the package.
9. Cold or warm boot the terminal to receive the changes.

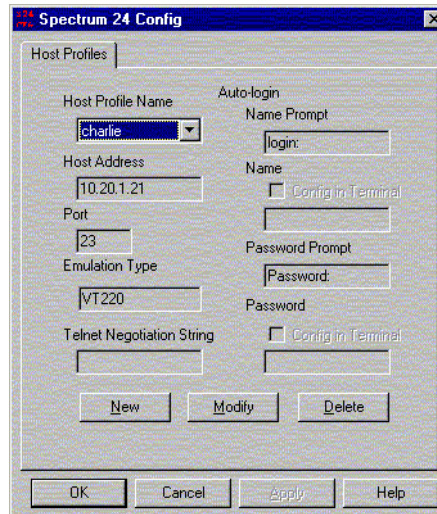


Figure 2.4 Host Profile Configuration Screen

5250 Workstation ID

This feature allows the user to define 5250 display station names for the RF terminals. Only the 5250 environment supports Workstation ID. Do the following to implement this feature:

1. Access the local Radio Configuration function. For most RF terminals, press FUNC, CTRL, R. See the Local Terminal Functions section of the RF terminal keyboard map for more details.
2. Choose Host Profiles from the CONFIG MENU. Select a 5250 host profile for which Workstation ID support is needed from the CONFIG HOST menu.

3. Press F2 from the first page of the host profile configuration screen.

```
Workstation ID  
SYMBOL001
```

```
F1=Help F2=NextPage
```

Figure 5.2 Workstation ID Terminal Form

4. Enter the Workstation ID name based upon the following criteria:
 - The length must be 1 to 10 characters.
 - The first character must be a letter, #, \$, or @.
 - The remaining characters can be letters, numbers, #, \$, @ or underscore.
5. Press CTRL + S to save the form and return to the CONFIG HOST menu. Use CTRL + X to abort the changes and return to the CONFIG HOST menu.
6. Press CTRL + S to save the form and return to the CONFIG MENU menu. Use CTRL + X to abort the changes and return to the CONFIG MENU menu.
7. At the Config Menu, press CTRL + S or select *Save Exit* to save all parameters changed during the configuration session.

Note: The *Save Exit* option or CTRL + S is required at the CONFIG MENU to permanently save parameters changed.

VT/HP Auto-Login

This feature allows the System Administrator to configure a default username and password for a given host profile. When this host profile is used, the user will not need to enter his or her personal login information to acquire access to the host machine. Follow the procedures outlined here to enable this feature.

1. Access the local Radio Configuration function. For most RF terminals, press FUNC, CTRL, R. See the Local Terminal Functions section of the RF terminal keyboard map for more details.
2. Choose Host Profiles from the CONFIG MENU. Select a VT/HP host profile for which Auto-Login support is needed from the CONFIG HOST menu.

3. Press F2 from the first page of the host profile configuration screen.

```
VT/HP Auto-Login
Name Prompt:
mail login:
Name: johnb
Password Prompt:
Password:
Password: saturn
F1=Help F2=NextPage
```

Figure 5.3 VT/HP Auto-Login Terminal Form

4. Enter the Name Prompt immediately below the Name Prompt prompt. The prompt must be typed exactly how it appears on the host screen. If there are any spaces that precede the prompt, they must be included as well. The Name Prompt, mail login:, shown on the VT/HP Auto-Login screen is an example of a Name Prompt.
5. Enter the username immediately to the right of the Name prompt. The username, johnb, shown on the VT/HP Auto-Login screen is an example of a username.
6. Enter the Password Prompt immediately below the Password prompt. The prompt must be typed exactly how it appears on the host screen. If there are any spaces that precede the prompt, they must be included as well. The Password prompt, Password:, shown on the VT/HP Auto-Login screen is an example of a Password prompt.
7. Enter the password immediately to the right of the Password prompt. The password, saturn, shown on the VT/HP Auto-Login screen is an example of a password.
8. Press CTRL + S to save the form and return to the CONFIG HOST menu. Use CTRL + X to abort the changes and return to the CONFIG HOST menu.
9. Press CTRL + S to save the form and return to the CONFIG MENU menu. Use CTRL + X to abort the changes and return to the CONFIG MENU menu.
10. At the CONFIG MENU, press CTRL + S or select *Save Exit* to save all parameters changed during the configuration session.

Note: The *Save Exit* option or CTRL + S is required at the CONFIG MENU to permanently save parameters changed.

VT/HP Telnet Negotiation String

The Telnet Negotiation String is used to set the terminal type during Telnet negotiation. If no string is specified, terminal type is determined by the emulation type selected.

1. Access the local Radio Configuration function. For most RF terminals, press FUNC, CTRL, R. See the Local Terminal Functions section of the RF terminal keyboard map for more details.

2. Choose Host Profiles from the CONFIG MENU. Select a VT/HP host profile for which a special Telnet Negotiation String is needed from the CONFIG HOST menu.
3. Press F2 from the first page of the host profile configuration screen. At the VT/HP Auto-Login screen, press F2 again.

Telnet Negotiation
String:

F1=Help F2=Next Page

Figure 5.4 Telnet Negotiation String Terminal Form

Note: When VT100, VT220, or HP are selected in the Emulation Type field, the Telnet Negotiation String does not need to be entered unless a special string is used.

4. Press CTRL + S to save the form and return to the CONFIG HOST menu. Use CTRL + X to abort the changes and return to the CONFIG HOST menu.
5. Press CTRL + S to save the form and return to the CONFIG MENU menu. Use CTRL + X to abort the changes and return to the CONFIG MENU menu.
6. At the CONFIG MENU, press CTRL + S or select *Save Exit* to save all parameters changed during the configuration session.

Note: The *Save Exit* option or CTRL + S is required at the CONFIG MENU to permanently save parameters changed.

Emulation Configuration

The Emulation Client software packages provide several terminal features that can be configured through the Avalanche Manager. Once changes are made, it is as simple as rebooting each terminal to receive the changes. It is no longer necessary to configure each terminal separately. Some of the more common terminal configuration parameters are:

- Enable/Disable Keyclicks
- Enable/Disable bar code symbologies read by the terminal scanner
- Define keyboard macros
- Adjust the BacklightTime parameter

For more information regarding emulation parameter refer to the *Spectrum24 Telnet Clients for 3270/5250 and VT/HP System Administrator's Guide* (Symbol Document Number:70-20244-02).

Emulation Configuration from the Avalanche Manager

1. Highlight the Telnet Client software package within the Management Console Tree View. Right click on the software package and select the *Configure Package* menu item.
2. From this context menu, choose *Emulation Parameters*. The Terminal Configuration Program list box will appear as shown here in Figure 5.5.

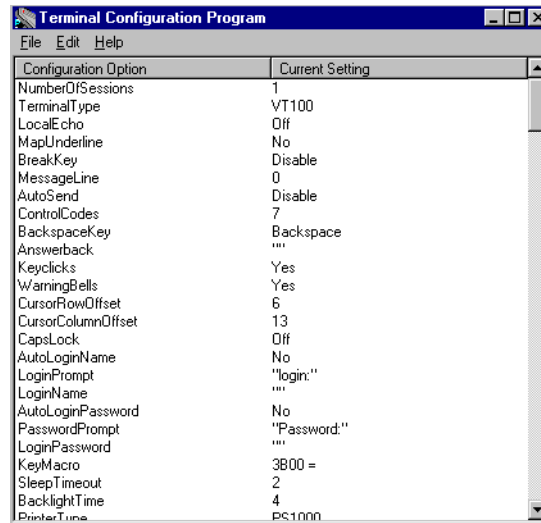


Figure 5.5 Emulation Configuration List Box

3. Navigate to desired configuration parameter.

The emulation configuration utility has a find feature. To find a specific parameter:

- a. Select Edit pulldown menu and choose the Find sub-menu item.
- b. Enter the text of the configuration option being searched as seen in Figure 5.6.

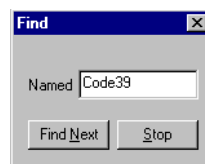


Figure 5.6 Find Pop-up Dialog Box

- c. For example, type in code39 to find the Symbology_Code39 configuration parameter. Note that the search is case insensitive.
4. Double click on the configuration parameter within the list box and make the appropriate change.

Press the Default button to return to the default setting. Figure 5.7 shows the dialog box for enabling and disabling the Code 39 bar code symbology.

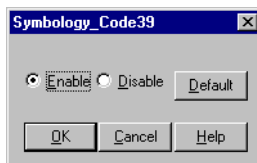


Figure 5.7 Code39 Enable/Disable Dialog Box

5. Press the Help button on a parameter's pop-up dialog box to view the details regarding the item.

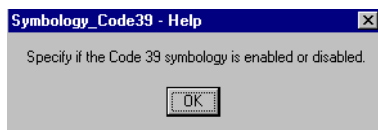


Figure 5.8 Code 39 Config Parameter Help

6. Click on the *FILE* menu and select *Save* to make the changes permanent. Repeat and choose *Exit* to leave the program. To cancel changes and leave the emulation configuration utility, select *Exit* from the menu.

Using Key Macros

The key macro feature is part of the Emulation Configuration program for both TN 5250/3270 and TN VT/HP clients. Key macros allow a key sequence to be remapped to perform another function other than its default function. A scan code is produced when pressing a key sequence on the terminal. In addition, a terminal's scan code can be acquired. The macro feature involves changing the meaning of a key's scan code to represent one of the following:

- Another scan code
- A sequence of text
- A combination of scan codes and text

Refer to the help for the KeyMacro configuration option for details on how to implement this feature in the Telnet Client software. One default KeyMacro entry is provided in the Terminal Configuration list box. Select the Edit pulldown menu and choose *Add KeyMacro* to add KeyMacro entries to the list box. Figure 5.9 shows an example of the default macro set such that the F1 key will log on to a 5250 application. This example contains a combination of scan codes and text. In this illustration, the username is ROI2, the scan code for the Field Exit key is 000D, the password is ROI2, and the scan code for Enter is 001B.

The format for this macro is:

```
"username"<space><scan code><space>"password"<space><scan code>
```

The syntax for the example is:

"ROI2" 000D "ROI2" 001B

Figure 5.10 displays the macro help screen for a 5250/3270 Telnet Client software package.

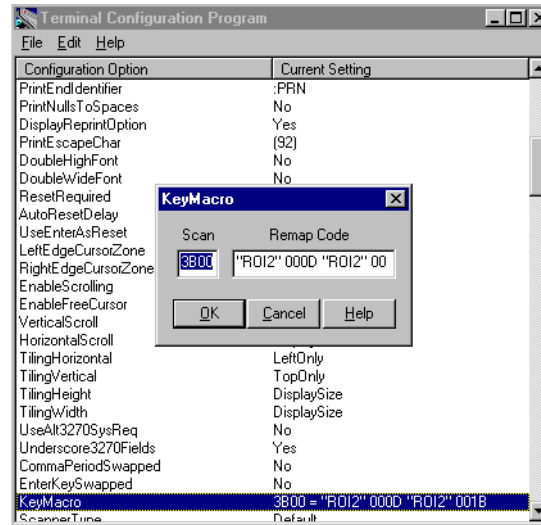


Figure 5.9 Macro Example

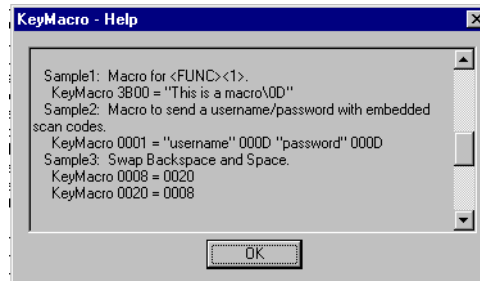


Figure 5.10 Macro Help Example for 5250/3270

Use the pulldown File menu to save the changes and choose Exit to leave the program. To cancel changes and leave the emulation configuration utility, select Exit from the menu.

Using Scanhandler

The Scanhandler feature is also part of the Emulation Configuration Program for both TN 5250/3270 and TN VT/HP clients. This option furnishes the capability to:

- specify one or all bar code symbology types.
- define a bar code length range or an exact bar code length.
- indicate stripping of a specific number of characters from either the beginning or the end of the bar code.

One blank Scanhandler entry is provided in the Terminal Configuration list box. Select the Edit pulldown menu and choose *Add ScanHandler* to add ScanHandler entries to the list box. Figure 5.11 shows an example of the default ScanHandler set such that a bar code with exactly seven characters may be scanned and the last two characters will be stripped.

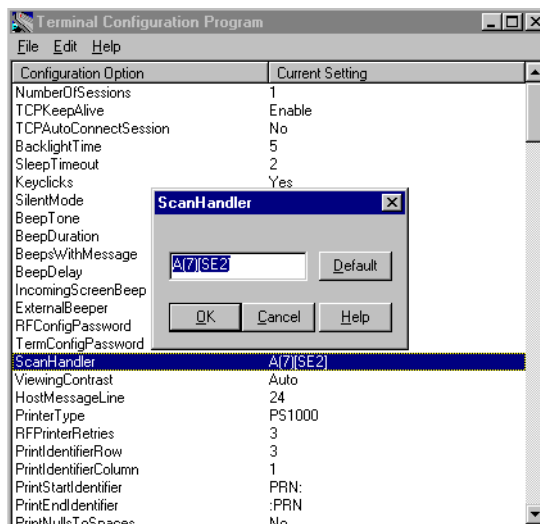


Figure 5.11 ScanHandler Feature

Use the pulldown File menu to save the changes and choose Exit to leave the program. To cancel changes and leave the emulation configuration utility, select Exit from the menu.

Terminal Program Information

For most RF terminals, press FUNC, CTRL, P to access the terminal software program information. See the Local Terminal Functions section of the RF terminal keyboard map for more details. This feature displays important terminal information such as the software package version, MAC address, and IP address.

Deleting Software Packages

Maintaining software packages must include a method for deleting of unwanted or no longer needed packages. The Avalanche products include two major methods. The first option is the deletion of specific packages from a specific mobile unit. The next option is a more global approach. This option will prepare all disabled packages for deletion.

Delete a Software Package on the Mobile Unit

To clean up packages off of a particular mobile unit, do the following.

1. Locate the software package needing to be deleted. The software packages are located in the tree view under software collections of the Avalanche Management Console.
2. Right-click on the software package icon and choose Disable Package from the context menu. The software package should display an orphaned status. An orphaned software package is a software package that the mobile unit has which the console thinks it should not have. The mobile unit information for the mobile unit no longer appears in the list view when the software package is disabled.
3. Click on the software collection where the software package resided to view the mobile unit in the list view.
4. Right-Click on the mobile unit within the list view and select Detail Client Controls from the context menu. The Detailed Client Controls dialog box appears as seen below in Figure 5.12.



Figure 5.12 Detailed Client Controls Window

5. Enable the Delete Orphaned Packages Checkbox and then Close.
6. Cold or warm boot the mobile unit to initiate the removal of the software packages from the mobile unit.

Delete all Orphaned Software Packages

This function deletes all disabled software packages within all mobile units serviced by a given Avalanche Manager.

1. Locate the software packages needing to be deleted. The software packages are located in the tree view under software collections of the Avalanche Management Console.

2. Right-click on the software package icon and choose Disable Package from the context menu. The software package should display an orphaned status. An orphaned software package is a software package that the mobile unit has which the console thinks it should not have. The mobile unit information for the mobile unit no longer appears in the list view when the software package is disabled.
3. Select Client Update Controls from the Tools menu. A dialog window will open. See Figure 5.13 .
4. Press the “Mark all orphaned packages in the clients for deletion (any packages in the clients but not on the console)” button followed by the Close button.
5. Cold or warm boot the mobile unit to initiate the removal of all orphaned software packages the mobile unit contains.

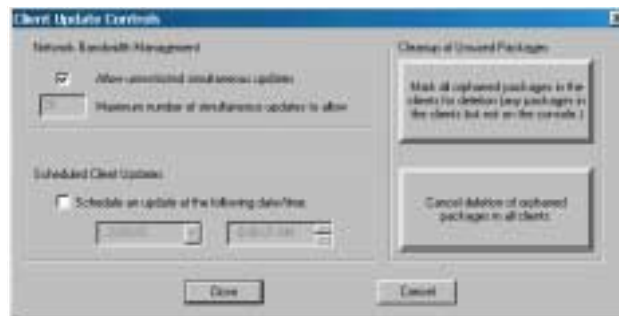


Figure 5.13 Client Update Controls Window

Localization

Localization Utility

Localization refers to modifying a product created for one market to suit the language, culture and client needs of another market. The items to consider when changing localization elements:

- Code Page
- Messages
- Keyboard Mapping

A *Code Page* contains the bitmaps for an entire font and the numerical values that correspond to those bitmaps. Users employ two code pages when performing terminal emulation with all 1000, 3000 and 6000 series terminals. One is found on the terminal and the other on the host. A translation table maps the client and host pages together. The RF terminals provide support for the following code pages.

- U.S. ASCII Standard
- ISO 8859-1

Messages are internal prompts to the Telnet Client software. In the 5250 emulation environment, scanning a bar code outside of a field generates the message `Scan Rejected No fields`.

Keyboard Mapping refers to mapping a key sequence to a specific character. The macro capability provided in the 5250/3270 and VT/HP emulations allows users to remap characters. For example users can remap the space character to the backspace character. Refer to *Using Key Macros on page 29* for more information.

Change the Code Page and Message File

Use these steps to change the code page and the message file.

1. Open the Avalanche Manager. Expand the Tree View's *Client Management* icon. Expand the *Software Collections* icon. Navigate to the respective software package found within the software collection where the package was installed.
2. Right-click on the software package. Select *Configure Package*.
3. Select *Localization*. Please see Figure 5.1.

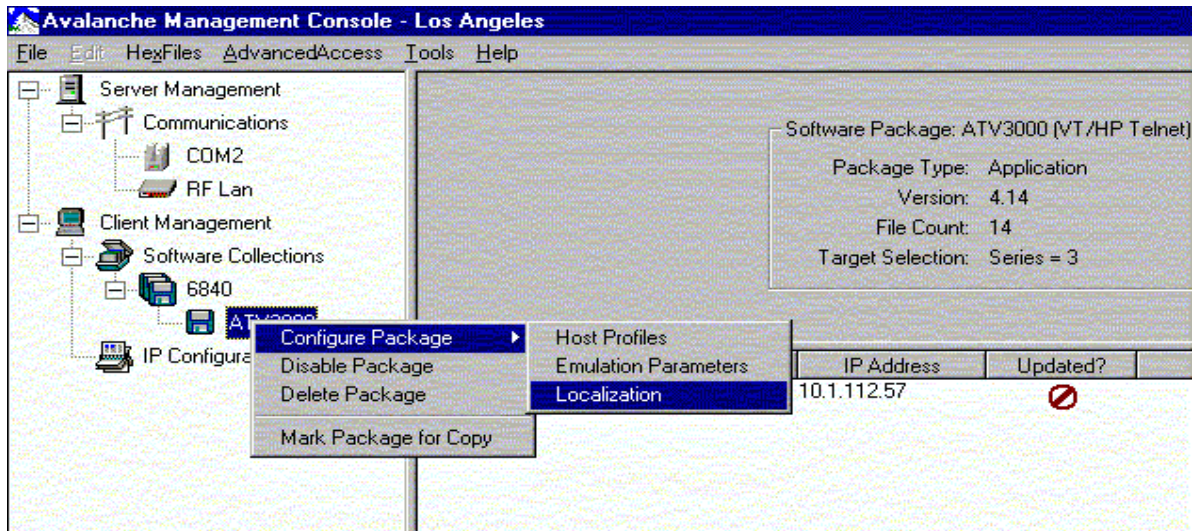


Figure 5.1 Selecting Localization Option

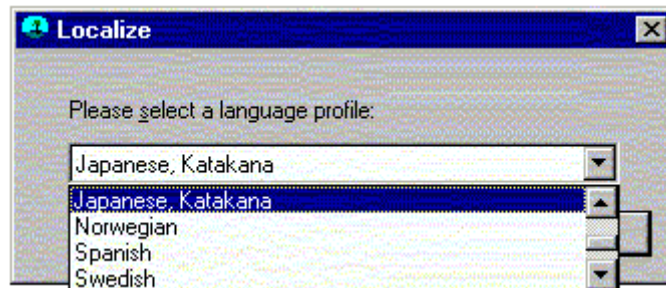


Figure 6.1 Localization Dialog Box

4. Indicate the desired language and press the OK button. See Figure 6.1.

Note: There are special software packages that support double-byte Asian character messaging.

5. Ensure that the software package is enabled.
6. Cold-boot the terminal to receive the desired changes.
7. Start the emulation software package. Look for the message changes to confirm proper installation.

Translate Messages and Create New Message File

Follow these steps to create a new message file containing recently translated messages.

1. Go to the desired language directory (see Figure 6.2).

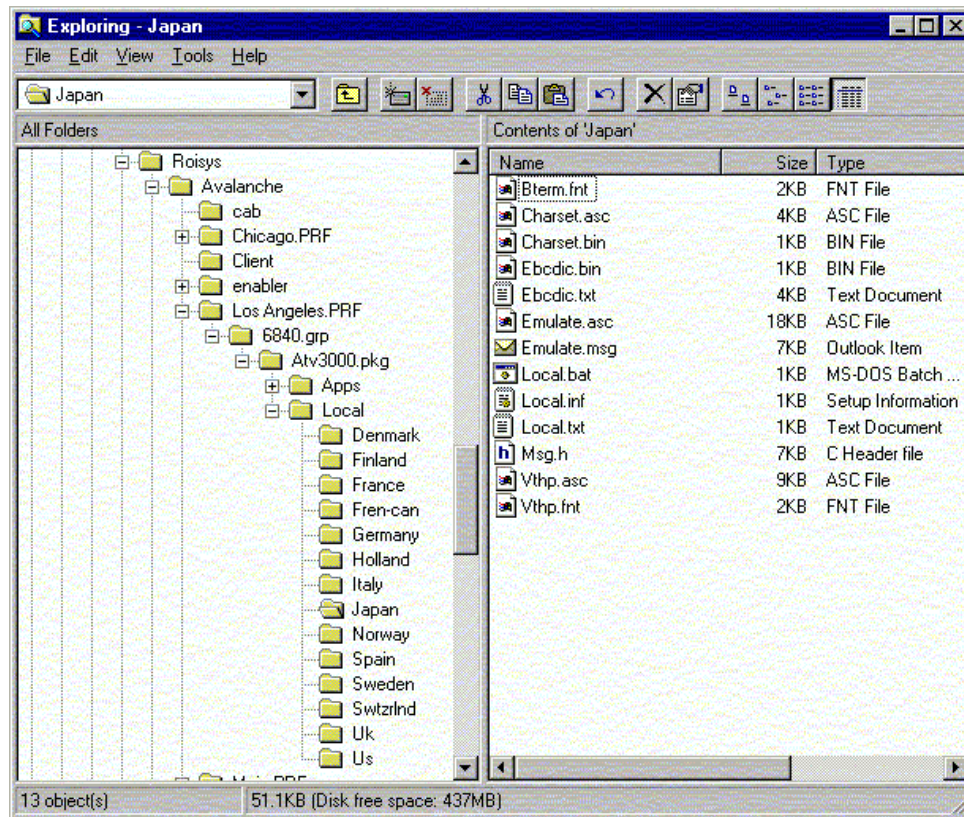


Figure 6.2 Sample Localization Directory Structure

2. Back up the existing emulate.asc file targeted for change.
3. Open the emulate.asc file with a text editor.

Note: It is crucial that message file editing is done with an editor that matches the code page of the language selected for the client.

Edit the file as necessary. Follow the instructions given within the emulate.asc file. There are specific instructions on what can and cannot be modified. For the latest information, study the read.me file that is included within the Local directory.

4. Compile the new message file within the local language directory using MSGCOMP.EXE. This is done at a DOS window command line.

Example: MSGCOMP emulate.asc

Note: The MSGCOMP executable is a 16-bit application. It may not function deep within a tree structure. The MSGCOMP.exe, the emulate.asc, and the msg.h files may need to be copied to a temporary directory closer to the root directory. After successfully compiling, the files will then need to be copied back to their original location.

The result of the example is a new emulate.msg file.

5. The Avalanche Manager will have to be closed then reopened to recognize the new files.
6. Select the appropriate message file and code page using the *Localization* dialog box within the Avalanche Manager. See Figure 5.1.

Note: For maximum flexibility, these localization files are designed to allow the end users to translate into the local languages. To institute the changes into newer releases, please email the translations to info@roisys.com.

Terminal Configuration Parameters

This section contains a list of parameters found within the Terminal Configuration Program. The Terminal Configuration Program provides a GUI environment to modify parameter settings. To gain access to the Terminal Configuration Program, right-click on the emulation software package, choose Configure Package, and select Emulation Parameters. The parameters listed within this document are grouped according to functionality.

Common Parameters

Common parameters are those with the same reference term and definition for the various emulation types. The following table displays the name of the feature and its associated functionality.

<i>NumberOfSessions</i>	Specify the number of concurrent TN sessions to support. Default: 1.
<i>SleepTimeout</i>	Specify the amount of time the terminal waits before going to sleep to conserve battery life. The default is 2 minutes from a 0 - 255 minute range. A 0-minute value disables sleep timeout.
<i>TCPKeepAlive</i>	Specify if sending a periodic ping message on a connected host. - Enable (default) - Disable.
<i>Keyclicks</i>	Specify if the terminal operates with beeps and keyclicks: - Yes. (default) - No.
<i>BeepDuration</i>	Specify the length of a terminal beep from a 0-1000 ms range. The default is 100.
<i>BeepDelay</i>	Specify the delay between beeps when multiple beeps are sounded. The default is 75 from a 0-1000 ms range.
<i>BeepsWithMessage</i>	Set the number of additional beeps sounded when receiving system messages. The default is 0 from a 1-9 range. Messages appear on the 24th line on the 3270/5250 and HP.
<i>ExternalBeeper</i>	Specify if adding an external beeper to the terminal for use in very noisy environments: - Yes - No (default).

<i>PrinterType</i>	<p>Select the printer type for use with a terminal from the following options:</p> <p>PS1000 - Symbol PS1000 (default) PS1001 - Symbol PS1001 PS1004 - Symbol PS1004 LINEPRINTER - Generic Line Printer DUMB - line printer with no RS-232 line monitoring COMTEC - Comtec MP5022 PATHFINDER - Monarch Pathfinder RASCAL - Monarch Rascal RENEGADE - Monarch Renegade COMTEC PS CODE COURIER COMTEC RF * COMTEC RF 9600 * SPT COMTEC** SPT_ELTRON** SPT_MONARCH_9490** SPT_ONEIL** SPT_PCL** SPT_POSTSCRIPT**</p> <p>*Comtec RF cableless printer for WSS 1040 only **For SPT1740 specifically</p>
<i>RFPrinterRetries</i>	<p>Specifies the number of times the WSS 1040 terminal attempts sending data to the cableless printer if it fails to get an acknowledgment at the first attempt. After attempting the maximum number of times, the terminal displays a failure to print message. The default is 3 from a range of 1-25.</p>
<i>LeftEdgeCursorZone</i>	<p>Specify from a range of 1-10 character positions how close the cursor gets to the left edge of the screen before the screen is scrolled. When the cursor is advanced outside of the specified cursor zone on the RF terminal's display, the display is repositioned over the full-screen display so that the cursor is placed near the center of RF terminal display screen. The default is 4.</p>
<i>RightEdgeCursorZone</i>	<p>Specify from a range of 1-10 character positions how close the cursor gets to the right edge of the screen before the screen is scrolled. When the cursor is advanced outside of the specified cursor zone on the RF terminal's display, the display is repositioned over the full-screen display so that the cursor is placed near the center of RF terminal display screen. The default is 1.</p>
<i>DoubleHighFont</i>	<p>A YES setting enables the display font in double high mode. The default is NO.</p>
<i>DoubleWideFont</i>	<p>A YES setting enables the display font in double wide mode. The default is NO.</p>

<i>ScannerType</i>	<p>Select the desired scanner type: LRT, LaserOnly, ContactWithPulse, ContactWithoutPulse, WandSimulator, AutoWithPulse, AutoWithoutPulse, DualTrigger, SingleTrigger, or Liberty.</p> <p>Default is the default value.</p> <p>A value of "Default" selects the standard for the current terminal type.</p>
<i>ScannerAngle</i>	<p>Specify the angle of adjustment for SE1200 scan engines: Narrow - to read normal bar codes (default) Wide - to read over-sized bar codes.</p>
<i>WSS1000BlinkMode</i>	<p>Specifies the blink mode as a Duty Cycle percentage supported by the WSS 1040 terminal for its scanner. The Duty Cycle indicates the percentage of time the scan pulses when it is active. The higher Duty Cycles improve the speed at which the scan engine acquires the data; the lower Duty Cycles improve the battery life of the terminal. The available blink modes for the Duty Cycles are as follow:</p> <ul style="list-style-type: none">0 = 100% Duty Cycle1 = 75% Duty Cycle2 = 67% Duty Cycle3 = 50% Duty Cycle4 = 40% Duty Cycle5 = 33% Duty Cycle6 = 29% Duty Cycle7 = 25% Duty Cycle <p>The default is 0.</p>
<i>STLRScanTimeout</i>	<p>The acquire timeout for single-position long-range scanners (mainly for 6840LR terminals). (Default=3)</p>
<i>BacklightTime</i>	<p>Enter a 2-digit value. specifying how long the back light remains on from a 1-99s range. The default is 5 s. Precede any single digit value with a zero (0).</p>
<i>BeepTone</i>	<p>Specify the terminal beep frequency from a 0-10000 Hz range. The default is 1000.</p>

KEY MACROS
(For Spectrum 24 Only)

Key macros allow a key sequence to be remapped to perform another function other than its default function. A scan code is produced when pressing a key sequence on the terminal. The macro feature involves changing the meaning of a key's scan code to represent one of the following:

- Another scan code
- A sequence of text
- A combination of scan codes and text

The syntax is:

```
KeyMacro scan_code = ["character_sequence" | scan_code] [..]
```

Double quotes are required around a character sequence, and spaces are required between character sequences and scan codes. A scan code will not be redefined if no definition is given. Scan codes are not recursive when used in a definition. ASCII codes can be embedded in character sequences by placing a backslash (\) and then two hexadecimal digits.

Sample 1: Macro for <FUNC><1>.

```
KeyMacro 3B00 = "This is a macro\0D"
```

Sample 2: Macro to send a username/password with embedded scan codes.

```
KeyMacro 0001 = "username" 000D "password" 000D
```

Sample 3: Swap Backspace and Space.

```
KeyMacro 0008 = 0020
```

```
KeyMacro 0020 = 0008
```

Scan codes for a key sequence can be determined by the current emulation running in a terminal. Do the following: Connect to the host with the emulation that will be used. Then enter Program Diagnostics (Press <FUNC><CTRL><D> on most terminals, check the keyboard map for your specific terminal). Then press 'K' for Keyboard Test and enter a key sequence to determine its scan code. Note that more than one key sequence can produce the same scan code. Also note that pressing the same key sequences on different terminals may produce different scan codes.

ScanHandler

The ScanHandler commands provides special processing of scanned data. Commands are available to strip data from the start or end of a bar codes, or to replace selected text within the bar code.

The commands can be targeted to only certain bar codes by specifying the Symbology and/or bar code length information. Any number of ScanHandlers can be defined as needed.

The Syntax is as follows:

Symbology(Length)[Command]

where "Symbology" is one of the following codes:

A = Any	J = D2 of 5
B = UPCE 0	K = I2 of 5
C = UPC 1	L = Code 11
D = UPC A	M = Code 93
E = MSI	N = Code 128
F = EAN 8	O = PDF 417
G = EAN 13	P = D2 of 5 IATA
H = Codabar	Q = UCC/EAN 128
I = Code 3 of 9	

"Length" is either a single value or a range (minimum and maximum values separated by a dash, no spaces.) Use a value of zero to match any length.

"Command" is one of the following single character codes, followed by any parameters specific to that command:

S = Strip characters from the bar code

Immediately follow with two parameters (no spaces):

Location (S = strip from the start; E = from the end)

Count (the number of characters to strip)

R = Replace characters within the bar code

Immediately follow with two character codes:

Search Character (the character to replace)

Replace Character (the character to replace it with)

These two values can be entered directly or may be defined by specifying a 2-digit hexadecimal value preceded by a single backslash. e.g., use \5D to represent a right angle bracket (]).

Examples:

N(0)[SE6] Strip 6 characters from the end of any Code 128 bar code

A(9-12)[R29] Replace all twos with nines in 9-12 digit bar codes of any symbology.

Q(16)[SS1] Drop the first character on UCC/EAN 128 bar codes of length 16.

<i>VerticalScroll</i>	Specify the number of rows to move when in view mode. The default is DisplaySize from a value range of DisplaySize or 1-24. DisplaySize uses the current screen size as the offset.
<i>HorizontalScroll</i>	Specify the number of columns to move when in view mode. The default is DisplaySize from a value range of DisplaySize or 1-24. DisplaySize uses the current screen size as the offset.
<i>FixedScreenMode</i>	Specify if the terminal screen stays in one place on the virtual screen: - Enable - Disable (default).
<i>FixedScreenTopEdge</i>	Specify the virtual screen row where the terminal screen is fixed, beginning with row 1. Default is 1 in a range of 1-24.
<i>FixedScreenLeftEdge</i>	Specify the virtual screen column where the terminal screen is fixed, beginning with column 1. Default is 1 in a range of 1-79.
<i>TCPAutoConnectSession</i>	Specify if the terminal should attempt to reconnect after a connection is closed. - Yes - No (default).
<i>SilentMode</i>	Determine if the terminal operates without beeps and keyclicks: - Yes - No (default).
<i>RFConfigPassword</i>	Specify terminal's RF configuration password (default=SYSTEM).
<i>TermConfigPassword</i>	Specify terminal's RF configuration password (default=CONFIG).
<i>TilingHorizontal</i>	Determine the handling of horizontal tiling when displaying a screen. VerticalScroll and HorizontalScroll parameters determine tile size. Possible options: None - positioning centers around the cursor. LeftOnly (default)- positioning is in the left column of the screen whenever the cursor is in columns 1 through N, where N is the physical screen width. Otherwise, logical position is around the cursor. All - always tile horizontally.
<i>TilingVertical</i>	Determine the handling of vertical tiling when displaying a screen. VerticalScroll and HorizontalScroll parameters determine tile size. Possible options: None - positioning is logically around the cursor. TopOnly (default) - positioning is at the uppermost row of the tiles. All - always tile vertically.
<i>TilingHeight</i>	Specify the height of a terminal display tile. The default, DisplaySize, is a flexible setting that dynamically adjusts the tile size with font size changes. Other choices can be from 1 to the height of the terminal display size.
<i>TilingWidth</i>	Specify the width of a terminal display tile. The default, DisplaySize, is a flexible setting that dynamically adjusts the tile size with font size changes. Other choices can be from 1 to the width of the terminal display size.

<i>AddScanIdentifier</i>	The host program uses a scan identifier to distinguish scanned data from manually entered data. Specify if prefixing a scan identifier character to each scanned bar code: - Yes - No (default).
<i>ScanIdentifier</i>	Specify the scan identifier character prefixed to scanned data if the AddScanIdentifier option is set to Yes. This can be any character.
<i>ViewingContrast</i>	Allows a specific contrast setting to be used. -Auto (default) - Automatically selects the most common setting for the terminal. -0-7 - lightest-darkest.
<i>PreferredScreenOffset</i>	When enabled, the physical display is positioned to the specified location whenever the cursor is located within the preferred offset. -Disable (default) -Enable
<i>PreferredOffsetTopEdge</i>	Specifies the top edge where the screen area is preferred. -1-24 (default=1)
<i>PreferredOffsetLeftEdge</i>	Specifies the left edge where the screen area is preferred. -1-80 (default=1)
<i>CommaPeriodSwapped</i>	Swap period with the comma on the keyboard. (default=No)
<i>EnableScrolling</i>	Specify if the user can enter view mode to scroll around the virtual display: - Yes. (default) - No.
<i>CursorRowOffset</i>	Specify the row of information displayed on the terminal in relation to the cursor position on the virtual screen. The column is always 14. The default is 6 from a 0-7 range.
<i>CursorColumnOffset</i>	Specify the column of information displayed on the terminal in relation to the cursor position on the virtual screen. The row is always 7. The default is 13 from a 0-19 range.
<i>RemoveBarcodeHeader</i>	Specify the beginning-character string if removing it from the bar code. ScanIdentifier, ScansStripStart, ScansStripEnd, and PreambleString options are ignored.
<i>ProgramExitKey</i>	Assigns a program exit key to a specified scan code (default=none defined).
<i>GreenScanLEDontime</i>	Time for green LED to remain on after scan (ms) Default: 3000
<i>ProgramExitPassword</i>	Once the program exit key has been pressed, an exit password can be required.

VT/HP Emulation Parameters

The following table provides explanations of possible options for VT/HP emulation parameters.

<i>VTLocalEcho</i>	Specify if the terminal uses local echo to reflect what is sent or received by the host: - ON - OFF (default).
<i>VTMapUnderline</i>	Since terminals do not display the underline attribute, specify if the underline attribute maps in reverse video: - Yes - No (default).
<i>VTBreakKey</i>	Specify if the BREAK key interrupts the connection between the terminal and the host: - Enable - Disable (default).
<i>HPMessageLine</i> (<i>HP Config only</i>)	If using a message line, select a line between 0 - 24. The default is 0 or disabled.
<i>HPAutoSend</i> (<i>HP Config only</i>)	Specify if the terminal automatically sends scanned data after scanning the last entry field: - Enable - Disable (default). The feature does not apply if the last entry is keyed in.
<i>VTControlCodes</i> (<i>ANSI Config only</i>)	Specify the ANSI control code the terminal uses: - 7-bit (default) - 8-bit.
<i>VTBackspaceKey</i> (<i>ANSI Config only</i>)	Specify the character sent by the BKSP key: - DEL (delete) character - BS (backspace) character (default).
<i>VTAnswerback</i> (<i>ANSI Config only</i>)	Specify the message to send upon receiving the ENQ character. The message can be a text string or part of or all of the terminal's MAC or IP address. To send a text string: Answerback="<text string>" To send part or all of a terminal's IP address: Answerback=IDENT [n] To send part or all of a terminal's MAC address: Answerback=IDENT MAC [n] n is an optional parameter specifying the number of bytes to make the identifier.
<i>VTWarningBells</i>	Specify if terminal operates with beeps and keyclicks: - Yes (default) - No.
<i>VTCapsLock</i>	Specify if the terminal operates with Caps Lock: - On - Off (default).
<i>VTLineMode</i>	Turn on/off pseudo Telnet line mode in the terminal. The default is off.

<i>VTDisableScanner</i>	Specify if the terminal disables the scanner after scans: - No (default) - Always - 1-D - 2-D. If selecting an option other than No, the host application must send an escape sequence to enable the scanner.
<i>VTScanTerminator</i>	Specify the scan terminator of up to 20 case-sensitive, alphanumeric characters suffixed to scanned data. The default is the hex value of the carriage return character (\0d).
<i>VTHandleTelxonSequences</i>	If enabled, this parameter provides support for Telxon escape sequences sent from the host. - Enable - Disable (default).
<i>VTAlternateEscapeChar</i>	Define the alternate ESCAPE character to look for when parsing escape sequences. The default is \1B.
<i>VTRemoveISO_IDs</i>	Remove ISO data identifiers from the beginning of bar codes. ISO data IDs include: IT, P, 1P, 1L, Q. (default=No)
<i>VTCopyScreenText</i>	Copies screen text at a given row/column and length to a new row/column. (row=1-24, col=1-80, length=1-80) FORMAT: OrigRow,OrigCol,NewRow,NewCol,Length EXAMPLE: 24,1,8,1,80 (Moves 80 characters from row=24,col=1 to row=8,col=1) NOTE: Coordinates are 1-based
<i>VTKeyclicks</i>	Specify if the terminal beeps when a key is pressed. Default: Yes

5250/3270 Emulation Parameters

The following table provides explanations of possible options for 5250/3270 emulation parameters.

<i>IncomingScreenBeep</i>	Determine if beep should be sounded when a new screen arrives from the host. - Yes (default) - No.
<i>PrintStartIdentifier</i>	Specify the print start identifier contained in display data preceding the print data: PRN:
<i>PrintEndIdentifier</i>	Specify the print end identifier contained in display data following the print data: :PRN
<i>PrintIdentifierRow</i>	Specify the row of the print start identifier. The default is 3.
<i>PrintIdentifierColumn</i>	Specify the column of the print start identifier. The default is 1.

<i>PrintNullsToSpaces</i>	Determine if nulls received by hosts that cannot display spaces in the printer protocol stream are converted to spaces before a send to the printer: - Yes - No (default).
<i>DisplayReprintOption</i>	Specify if the terminal displays a reprint prompt after completing a print job: - Yes. (default) - No.
<i>PrintEscapeChar</i>	Specify the escape character used to embed special values within a print screen. The default is a backslash character (\ - Dec=92; Hex=5C). Change this character only in languages that do not have the backslash character in the EBCDIC character set. An example of such a language is Katakana.
<i>ResetRequired</i>	Define situations that require pressing RESET: OnAllMessages - requires RESET on screens displaying information on line 24 (the bottom display line). OnErrors - requires RESET on screens having the error indicator set (default) Never - never prompts for RESET. RESET is automatically performed when an error indicator is detected.
<i>AutoResetDelay</i>	Specify the number of seconds to wait before sending a reset to the host when ResetRequired is set to Never. The default is 2 from a 0 - 5 range where 0 means no waiting.
<i>UseEnterAsReset</i>	Specify if the ENTER key can work as RESET key when the terminal is in an error state: - Yes - No (default).
<i>EnableFreeCursor</i>	Specify if the user has access to move the cursor into protected areas of the screen: - Yes. (default) - No.
<i>UseAlt3270SysReq</i> (3270 only)	Specify if encoding TN3270 SYSTEM REQUEST as - REQUEST instead of the default INTERRUPT-PROCESS. - Yes - No (default)
<i>EnterKeySwapped</i> (5250 only)	The standard keyboard layout maps the terminal ENTER key to the FIELD EXIT key and the terminal CLEAR key to the ENTER key. Specify if this keyboard layout is swapped: - Yes - No (default).
<i>DisableDataIds</i>	This option disables or enables the use of data identifiers during scans. A Data Identifier is the first character of the scanned data in a bar code. It allows a user to associate scanned data automatically with fields in the terminal emulation screen. Specify if disabling use of a data identifier sequence: - Yes - No (default).

<i>ScanEscapeCode</i>	<p>Specify the escape character used when scanning aid keys. Use a character supported by the symbology, but not one commonly used in bar code operation. This prevents interpreting bar codes not intended to produce AID keys as AID key bar codes. Extended Code 39 supports the default setting, ASCII escape character (Dec=27).</p>
<i>AutoSendScans</i>	<p>The terminal can be set up to automatically send to the host after bar codes are scanned. The options are:</p> <ul style="list-style-type: none">-Yes - Auto-send after each bar code is scanned.-No - Do not Auto-Send after any bar codes.-LastOnly - Only Auto-Send if bar code scanned into the last field. <p>The default is No.</p>
<i>WSS1000MenuKey</i>	<p>Specify the key-function of the configurable MENU key on the WSS 1040. The MENU key can represent any of the following keys: PRINT, HELP, HOME, ATTENTION, ROLLUP, ROLLDOWN, CLEAR, ENTER, F1 through F24. The default is F3.</p>
<i>WSS1000HelpKey</i>	<p>Specify the key-function of the configurable HELP key on the WSS 1040. The HELP key can represent any of the following keys: PRINT, HELP, HOME, ATTENTION, ROLLUP, ROLLDOWN, CLEAR, ENTER, F1 through F24. The default is F1.</p>
<i>UseLXECoopRules</i> <i>(3270 only)</i>	<p>Specify if using the cooperative programming rules defined by LXE Corporation to allow a 3270 entry field to function as an auto-send field. This rule is not native to 3270:</p> <ul style="list-style-type: none">- Yes- No (default).
<i>TabOnScans</i> <i>(3270 only)</i>	<p>TabOnScans determines if the terminal jumps to the next field after a scan. Disable to append multiple scans to the same field, or to allow keyboard entry after a scan.</p> <p>Default: Yes</p>
<i>ClearFieldOnScans</i> <i>(3270 only)</i>	<p>Specify if the terminal functions normally and erases the contents of the current entry field before filling it with scanned data. Turn off this feature for host applications that require the reverse.</p> <ul style="list-style-type: none">- Yes. (default)- No.
<i>AllowScanAhead</i>	<p>Without scan ahead, the scanner is disabled while data is sent to the host. Specify if a user can scan ahead while the host is processing the last screen's data:</p> <ul style="list-style-type: none">- Yes- No (default).

<i>OversizedScanning</i>	Specify how oversized scanned data is handled: DoNotAllow - Do not allow scanned data longer than the entry field being scanned into. (default) Truncate - Truncate scanned data to the length of the input field and discard remaining data. Split - Wrap the oversized data into subsequent fields. This allows filling of two or more entry by scanning a single bar code.
<i>DisplayTruncateMsg</i>	Requires the Truncate setting in the OversizedScanning parameter. Specify if a message displays informing the user of data truncation: - Yes. (default) - No.
<i>HostMessageLine</i>	Assigns the screen row which contains host messages (default=24). -1-24 - valid host lines -0 - ignore host messages.
<i>ShiftKeyboardToField-Type</i> (5250 virtual keyboard only)	Determine if the keyboard state be modified when entering a new field to match the field type (numeric or alpha). (default=Yes)
<i>AlphaKeyboardName</i> (5250 virtual keyboard only)	When the cursor enters an alphabetic only field and ShiftKeyboardToFieldType is 'Yes', this specifies the name of the keyboard that should become active. (default=CapsLock)
<i>NumericKeyboardName</i> (5250 virtual keyboard only)	When the cursor enters a numeric only field and ShiftKeyboardToFieldType is 'Yes', this specifies the name of the keyboard that should become active. (default=NVM)
<i>KbdIdentifierString</i> (5250/3270 virtual keyboard only)	String on the host to indicate a Virtual Keyboard Command will follow. (default=KBD:)
<i>KbdIdentifierRow</i> (5250/3270 virtual keyboard only)	Location row for the string on the host to indicate a Virtual Keyboard Command will follow. (default=3)
<i>KbdIdentifierColumn</i> (5250/3270 virtual keyboard only)	Location column for the string on the host to indicate a Virtual Keyboard will follow. (default=1)
<i>Underscore3270Fields</i> (3270 only)	Allows underscoring of entry fields. (default=Yes)
<i>Attribute</i>	Allows display attributes to be mapped from one type to another. (default=none defined)

Com Out and Com In Parameters

These parameters refer to the ability of sending data to and from the host through a serial port. In this scenario, the RF terminal is connected to a serial port (Terminal may be sitting in its cradle). Unless otherwise specified, all parameters described here apply to 5250/3270 and VT/HP emulations.

<i>UseComInput</i>	<p>Allows using the com port for data input and output.</p> <ul style="list-style-type: none"> -Yes - enables option. -No (default) - disables option. -Auto - enables com port for data entry when the terminal is in the cradle or attached to a charger.
<i>ComPortForIO</i>	<p>Selects the com port to be used for data I/O.</p> <ul style="list-style-type: none"> -1 (default) - COM1 -2 - COM2
<i>ComPortBaudRate</i>	<p>Specifies the baud rate to use for com port communications. Possible options: 1200, 2400, 4800, 9600 (default), 19200, 38400.</p>
<i>ComPortParity</i>	<p>Specifies the parity to use for com port communications. Possible options: None (default), Odd, Even, Space, Mark.</p>
<i>ComPortStopBits</i>	<p>Select the Stop Bits to be used for Com Port communications. Default: 1, Options: 1,2</p>
<i>ComPortFlowControl</i>	<p>Select the Flow Control to be used for Com Port communications. Default: None, Options: None, Hardware, Software</p>
<i>ComPortDataBits</i>	<p>Specifies the data bits to use for com port communications. Possible options: 7, 8 (default).</p>
<i>ComPortparityMask</i>	<p>A mask can be applied to each byte received through the com port. Setting the mask to <FF> prevents data from being modified. Possible options: 0-255.</p>
<i>UseComStartEndChars</i>	<p>A start and end character can be specified to prevent noise or other unwanted data from being entered into the keyboard from the com port. Only data between the start and end characters will be entered into the keyboard buffer.</p> <ul style="list-style-type: none"> -Yes - enable use of start and end characters -No (default) - don't use start and end characters.
<i>ComPortDataStartChar</i>	<p>Specifies the start character for UseComStartEndChars. Possible options: 0-255. (default=<02>)</p>
<i>ComPortDataEndChar</i>	<p>Specifies the end character for UseComStartEndChars. Possible options: 0-255. (default=<03>)</p>
<i>ComPortDataTimeout</i>	<p>Specifies the amount of time in milliseconds the terminal should wait for the next character from the com port before either discarding the data it has received so far (if using start and end characters) or sending the data to the host (if blocking data). Possible options: 0-30000. (default=50)</p>
<i>ComPortDataEntryMode</i> (5250/3270 only)	<p>Specifies how the com port data should be entered.</p> <ul style="list-style-type: none"> -Keyboard (default) - each byte is entered as if it came from the keyboard. -ComEntryField.

<i>ComPortTranslateIO</i>	Determine if all data going to the com port is to be translated from a two-digit hex value to a single byte containing the value of the two hex digits and if all data received from the com port to be translated from a single value to two hex digits before being entered through the keyboard buffer. -Yes - Enable translation. -No (default) - Disable translation.
<i>ComPortIOScreenID</i> (5250/3270 only)	Specifies the screen identifier to use to block data that will be sent out the com port. (default=OUTCOM)
<i>ComPortIOScreenIDRow</i> (5250/3270 only)	Specifies the row on the display screen where the ComPortIOScreenID will be found (1-based). (default=3)
<i>ComPortIOScreenIDCol</i> (5250/3270 only)	Specifies the column on the display screen where the ComPortIOScreenID will be found (1-based). (default=1)
<i>ComPortBlockData</i>	Specifies whether data should be held until the ComPortDataTimeout is reached before adding the block of data to the keyboard buffer. (default= No)
<i>ComPortDataTerminator</i>	Allows a terminator to be added to the data after it is received from the com port. (default=None)

Symbology Options

Possible options for *symbology* parameters are explained below.

Symbologies are enabled or disabled. Scanners read disabled symbologies but do not pass the information to the emulation software. The parameters below the symbology options modify scanned data interpretations.

Note: Emulation-specific symbology parameters are specified as such.

The *ScanIdentifier* and *ScanTerminator* options for TNVT/HP append a string to all bar code data. The *AddPreambleString* and *AddPostambleString* options append a string to the bar code data based on the symbology. *AddPreambleString* and *AddPostambleString* apply to both 5250/3270 and VT/HP. The host receives data in the following format:

[scan identifier] [preamble] bar code data [postamble] [scan terminator]

For All Symbologies

<i>AllScansStripStart</i>	Define the number of characters to be stripped from every bar code read. Number of characters stripped from the beginning of all bar codes
<i>AllScansStripEnd</i>	Number of characters stripped from the end of all bar codes.

For UPC E0:

<i>Symbology_UPCE0</i>	Enable/disable the UPC E0 symbology. Default: Enabled
<i>UPCE0_convert</i>	A UPC A label with enough zeros can be condensed into a 6-character label. A Yes setting expands the 6 character UPC E0 label to its equivalent 12 character UPC A label. The label type indicator also changes to UPC A. The default is No.
<i>UPCE0_ret_CD</i>	A Yes setting returns the verified check digit as a part of the scanned data when a UPC E0 bar code is read. The default is No.
<i>UPCE0_preamble</i>	A Yes setting returns the preamble (first) character to the application with the scanned data. The default No setting discards the character.
<i>UPCE0_minlength</i>	Specify minimum length for a UPC E0 bar code. The default is 6 from a 0-255 range.
<i>UPCE0_maxlength</i>	Specify maximum length for a UPC E0 bar code. The default is 6 from a 0-255 range.
<i>UPCE0_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>UPCE0_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>UPCE0_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>UPCE0_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For UPC E1:

<i>Symbology_UPCE1</i>	Enable/disable the UPC E1 symbology. Default: Enabled
<i>UPCE1_convert</i>	A UPC A label with enough zeros can be condensed into a 6-character label. UPC E1 labels are zero-suppressed UPC A labels. A Yes setting expands the 6 character UPC E1 label to its equivalent 12 character UPC A label. The label type indicator also changes to UPC A. The default is No.
<i>UPCE1_ret_CD</i>	A Yes setting returns the verified check digit as a part of the scanned data when a UPC E1 bar code is read. The default is No.
<i>UPCE1_preamble</i>	A Yes setting returns the preamble (first) character to the application with the scanned data. The default No setting discards the character.
<i>UPCE1_minlength</i>	Specify minimum length for a UPC E1 bar code. The default is 6 from a 0-255 range.
<i>UPCE1_maxlength</i>	Specify maximum length for a UPC E1 bar code. The default is 6 from a 0-255 range.

<i>UPCE1_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>UPCE1_ScanStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>UPCE1_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>UPCE1_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For UPC A:

<i>Symbology_UPCA</i>	Enable/disable the UPC A symbology. Default: Enabled
<i>UPCA_ret_CD</i>	The default Yes setting returns the verified check digit as a part of the scanned data when a UPC A bar code is read.
<i>UPCA_preamble</i>	The default Yes setting returns the preamble (first) character to the application with the scanned data. A No setting discards the character.
<i>UPCA_minlength</i>	Specify minimum length for a UPC A bar code. The default is 12 from a 0-255 range.
<i>UPCA_maxlength</i>	Specify maximum length for a UPC A bar code. The default is 12 from a 0-255 range.
<i>UPCA_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>UPCA_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>UPCA_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>UPCA_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For MSI:

<i>Symbology_MSI</i>	Enable/disable the MSI symbology. Default: Enabled
<i>MSI_CD</i>	Specify the number of check digits verified (the last character is the first check digit and the next-to-last character the second check digit). MSI Code has one or two check digits. Values other than these causes unpredictable decoder operation. For example, the decoder defaults a zero value to one check digit. The default is 1. Do not include the number of check digits in the MSI length specification even if they are reported back to the application.

<i>MSI_redundancy</i>	A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. The default is No.
<i>MSI_ret_CD</i>	A Yes setting returns MSI check digit(s) with the scanned data. This field has no effect on the MSI length specification; the length specification only accounts for data characters. The default is No.
<i>MSI_minlength</i>	Specify minimum length for an MSI bar code. The default is 4 from a 0-255 range.
<i>MSI_maxlength</i>	Specify maximum length for an MSI bar code. The default is 55 from a 0-255 range.
<i>MSI_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>MSI_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>MSI_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>MSI_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For EAN 8:

<i>Symbology_EAN8</i>	Enable/disable the EAN 8 symbology. Default: Enabled
<i>EAN8_convert</i>	The Yes setting increases EAN 8 labels to 13 characters by adding zeroes. It is used when placing EAN 13 labels and EAN 8 labels into the same input field. The default is No.
<i>EAN8_minlength</i>	Specify minimum length for an EAN 8 bar code. The default is 8 from a 0-255 range.
<i>EAN8_maxlength</i>	Specify maximum length for an EAN 8 bar code. The default is 8 from a 0-255 range.
<i>EAN8_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>EAN8_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>EAN8_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>EAN8_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For EAN 13:

<i>Symbology_EAN13</i>	Enable/disable the EAN 13 symbology. Default: Enabled
<i>EAN13_minlength</i>	Specify minimum length for an EAN 13 bar code. The default is 12 from a 0-255 range.
<i>EAN13_maxlength</i>	Specify maximum length for an EAN 13 bar code. The default is 12 from a 0-255 range.
<i>EAN13_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>EAN13_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>EAN13_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>EAN13_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For Code 39:

<i>Symbology_Code39</i>	Enable/disable the Code 39 symbology. Default: Enabled
<i>Code39_full_ASCII</i>	Full ASCII is a Code 39 feature enabling full representation of the ASCII character set by combining certain pairs of Code 39 characters. A Yes setting returns the character created by combining and encoding two standard Code 39 characters in a label. The default No setting returns labels containing Full ASCII representations as two standard Code 39 characters instead.
<i>Code39_CD</i>	The Yes setting requires that the check digit character is present and correct before scanning data. The default No setting considers the character in the check digit position as part of the scanned data and not a check digit.
<i>Code39_redundancy</i>	A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. Default: No
<i>Code39_minlength</i>	Specify minimum length for a Code 39 bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.
<i>Code39_maxlength</i>	Specify maximum length for a Code 39 bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.
<i>Code39_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>Code39_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>Code39_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.

Code39_AddPostambleString Add a string to the end of bar code data based on symbology.

For Code D2of5:

Symbology_D2of5 Enable/disable the D 2 of 5 symbology. Default: Enabled

D2of5_redundancy A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. The default is No.

D2of5_minlength Specify minimum length for a D 2 of 5 bar code. The default is 0 from a 0-255 range.

D2of5_maxlength Specify maximum length for a D 2 of 5 bar code. The default is 0 from a 0-255 range.

D2of5_ScansStripStart Specify the number of characters to strip from the beginning of the bar code. The default is 0.

D2of5_ScansStripEnd Specify the number of characters to strip from the end of the bar code. The default is 0.

D2of5_AddPreambleString Add a string to the beginning of bar code data based on symbology.

D2of5_AddPostambleString Add a string to the end of bar code data based on symbology.

For Code 11:

Symbology_Code11 Enable/disable the Code 11 symbology. Default: Enabled

Code11_CD Specify the number of check digits verified (the last character is the first check digit and the next-to-last character the second check digit). Code 11 can have zero, one, or two check digits. The default is 1.

Do not include the number of check digits in the Code 11 length specification even if the application receives a report on the number.

Code11_redundancy A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. The default is No.

Code11_ret_CD A Yes setting returns Code 11 check digit(s) with the scanned data. This field has no effect on the Code 11 length specification; the length specification only accounts for data characters. The default is No.

<i>Code11_minlength</i>	Specify minimum length for a Code 11 bar code. The default is 4 from a 0-255 range.
<i>Code11_maxlength</i>	Specify maximum length for a Code 11 bar code. The default is 55 from a 0-255 range.
<i>Code11_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>Code11_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>Code11_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>Code11_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For Code 93:

<i>Symbology_Code93</i>	Enable/disable the Code 93 symbology. Default: Enabled
<i>Code_93_redundancy</i>	A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. The default is No.
<i>Code93_minlength</i>	Specify minimum length for a Code 93 bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.
<i>Code93_maxlength</i>	Specify maximum length for a Code 93 bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.
<i>Code93_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>Code93_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>Code93_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>Code93_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For Code 128 and EAN/UCC 128:

<i>Symbology_Code128</i>	Enable/disable the Code 128 symbology. Default: Enabled
<i>Code_128_redundancy</i>	A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. The default is No.
<i>Code128_minlength</i>	Specify minimum length for a Code 128 bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.

<i>Code128_maxlength</i>	Specify maximum length for a Code 128 bar code. The default, 0 from a 0-255 range, indicates any length up to 255.
<i>Code128_GS_substitute</i>	EAN128 embedded AI codes begin with GS which cannot be entered into most host's entry fields. This option allows substitution of some other character that can. Default: 64 decimal, which is '@'
<i>Code128_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>Code128_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>Code128_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>Code128_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.
<i>UCCEAN128_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>UCCEAN128_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>UCCEAN128_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>UCCEAN128_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For Code I2of5:

<i>Symbology_I2of5</i>	Enable/disable the I 2 of 5 symbology. Default: Disabled
<i>I2of5_redundancy</i>	A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. Default: No
<i>I2of5_minlength</i>	Specify minimum length for an I2of5 bar code. The default is 0 from a 0-255 range.
<i>I2of5_maxlength</i>	Specify maximum length for an I2of5 bar code. The default is 0 from a 0-255 range.
<i>I2of5_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. Default: 0
<i>I2of5_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. Default: 0
<i>I2of5_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>I2of5_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For Codabar:

<i>Symbology_Codabar</i>	Enable/disable the Codabar symbology. Default: Disabled
<i>Codabar_redundancy</i>	A Yes setting enables redundancy and requires decoding a bar code twice from two separate laser scans. The two separate laser scans occur with the single activation of the scanner trigger. Default: No
<i>Codabar_CLSI</i>	The Yes setting reformats a 14-character codabar symbol (not including stop/start characters) by removing the start and stop characters and adding spaces after the first, fifth and tenth digits. For example, the A12345678901234 symbol changes to 1 2345 67890 1234. The default is No.
<i>Codabar_NOTIS</i>	The Yes setting removes start and stop characters from codabar scans. The default is No.
<i>Codabar_minlength</i>	Specify minimum length for a Codabar bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.
<i>Codabar_maxlength</i>	Specify maximum length for a Codabar bar code. The default, 0 from a 0-255 range, indicates any length up to 255 is valid.
<i>Codabar_ScansStripStart</i>	Specify the number of characters to strip from the beginning of the bar code. The default is 0.
<i>Codabar_ScansStripEnd</i>	Specify the number of characters to strip from the end of the bar code. The default is 0.
<i>Codabar_AddPreambleString</i>	Add a string to the beginning of bar code data based on symbology.
<i>Codabar_AddPostambleString</i>	Add a string to the end of bar code data based on symbology.

For supplementals:

<i>Symbology_Supps</i>	Enable/disable the feature determining if supplemental bar codes are read with UPC and EAN bar codes. The default is Disabled.
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<i>UPC_EAN_supp_mode</i>	<p>Select the method of handling supplemental bar codes from the following options:</p> <p>NoSupps - Ignores supplemental bar codes. This is equivalent to disabling supplementals. (default)</p> <p>OnlySuppLabels - Verifies that the UPC label has an attached supplemental bar code that matches the enabled lengths. For example, 2-character and 5-character supplemental bar codes are valid if <i>UPC_EAN_supp_2</i> and <i>UPC_EAN_supp_5</i> are set to Yes. If <i>UPC_EAN_supp_2</i> is set to Yes but <i>UPC_EAN_supp_5</i> is set to No, only 2-character supplemental bar codes are valid.</p> <p>SuppsOptional - Reports if the decoder determines there is a supplemental of any length. <i>UPC_EAN_supp_2</i> and <i>UPC_EAN_supp_5</i> have no effect in this mode.</p>
<i>UPC_EAN_security</i>	<p>Determine the stringency of the decode algorithm for UPC and EAN bar codes. It prevents incorrect decodes by aiding in decoding poor labels. The lower the level, the less stringent, but the more aggressive the decoding. A higher security level provides greater insurance against incorrect decodes. The default is 0 from a 0-3 range.</p>
<i>UPC_EAN_supp_2</i>	<p>This option supports the <i>UPC_EAN_supp_mode</i>. The Yes setting decodes supplemental bar codes of length 2. The default No setting does not decode supplemental bar codes of length 2.</p>
<i>UPC_EAN_supp_5</i>	<p>This option supports the <i>UPC_EAN_supp_mode</i>. The Yes setting decodes supplemental bar codes of length 5. The default No setting does not decode supplemental bar codes of length 5.</p>
<i>UPC_EAN_supp_retry</i>	<p>Recognizes the presence or absence of supplementals and reports them. If labels with and without supplementals are returned to the application, this option determines how many times the decoder attempts to decode the UPC label before it registers that there are no supplementals. The default is 5 from a 2-10 range.</p>
<i>UPC_EAN_linear</i>	<p>UPC labels are divided into left and right blocks (manufacturer and item numbers). The default No setting increases the aggressiveness of a UPC decoder and allows it to combine a block from a partially decoded UPC label with a block decoded in an earlier scan (providing it matches in type and passes the check digit test) to create a decoded label. The Yes setting forces the decoder to decode all label blocks in the same sweep and is preferred when scanning multiple labels with potentially interchangeable blocks in the laser field.</p>

For other scanner features:

<i>BidirRedundancy</i>	Determine the type of redundancy used when using the redundancy feature for at least one of the symbologies. The Yes setting requires that the two decodes of the bar code must be in opposite laser sweep directions. The default No allows the two decodes to be in the same laser sweep direction.
<i>TransmitCodeIdChar</i>	<p>The Yes setting prefixes a symbology code to the scanned data returned to the application. The ASCII characters representing the symbologies are:</p> <ul style="list-style-type: none">A - UPC, UPCE0, UPCE1, EAN8, EAN13B - Code 39C - CodabarD - Code 128E - Code 93F - I 2 of 5G - D 2 of 5H - Code 11J - MSIK - EAN/UCC 128 <p>Default: No</p>

Keyboard Maps

The keyboard maps are a set of documents which describe how to use the terminal features, the various emulation types supported, the character keyboards and the terminal booting procedures. Booting procedures explained in this section apply to both the 5250/3270 and VT/HP software packages. The remainder of the maps are organized in the following manner.

- Local Terminal Functions - These key sequences provide access to external functions such as Radio Configuration, Program Information, View Mode, and the Lamp.
- Emulation Keys - These key sequences provide access to the emulation-specific functions. Example keys within respective emulation types: FIELD EXIT key in 5250, NEW LINE in 3270, ESC in VT100, or Find in VT220.
- Character Keyboard Map - These are characters within the first 128 characters of the ASCII keyboard set. The numbers 0-9, the letters A-Z and special characters such as the question mark, colon, period and control characters fall into this category.

5250/3270 Key Maps

Symbol 6840, 3840, 3140 and 6140 46-Key Terminals

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <4> and <5> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <A> and <D> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <F> and <I> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Lamp On/Off	<FUNC><L>
Darker Display	<FUNC><M>
Lighter Display	<FUNC><N>
Program Information	<FUNC><CTRL><P>
Diagnostics	<FUNC><CTRL><D>
Keyclicks On/Off	<FUNC><CTRL><K>
Quiet Mode On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
Message Recall	<CTRL><M>
Free Cursor Mode	<CTRL><. >
Previous Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<FUNC><SHIFT>
View Mode On/Off ^a	<CTRL><Z>
Scroll Left	<X>
Scroll Right	<Y>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>
Switch L/R Scan Button	<FUNC><SCAN BUTTON>

a. The <CTRL> and one of the scroll keys will also enable View Mode.

5250 Emulation Keys

5250 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CTRL><CLEAR>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<CLEAR>
Erase Input	<CTRL><E>
Field Exit	<ENTER>
Field Minus	<SHIFT><ENTER>
Help	<CTRL><H>
Home	<CTRL><G>
Insert	<CTRL><I>
Print	<CTRL><P>
Reset	<CTRL><R>
Roll Up	<CTRL><U>
Roll Down	<CTRL><V>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>

5250 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

3270 Emulation Keys

3270 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CLEAR>
Clear EOF	<CTRL><O>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<ENTER>
Erase Input	<CTRL><E>
Field Mark	<CTRL><F>
Home	<CTRL><G>
Insert	<CTRL><I>
New Line	<CTRL><ENTER>
Reset	<CTRL><R>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>
PA1	<CTRL><U>
PA2	<CTRL><V>
PA3	<CTRL><W>

3270 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

5250/3270 Character Map

Char	Key Sequence
SPACE	<FUNC><BKSP>
!	<FUNC><CTRL><1>
“	<SHIFT><FUNC><R>
#	<FUNC><CTRL><3>
\$	<FUNC><CTRL><4>
%	<FUNC><CTRL><5>
&	<FUNC><CTRL><7>
'	<FUNC><R>
(	<FUNC><CTRL><9>
)	<FUNC><CTRL><0>
*	<FUNC><C>
+	<FUNC><A>
,	<FUNC><S>
-	<FUNC>
.	<. >
/	<FUNC><D>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><FUNC><O>
;	<FUNC><O>
<	<SHIFT><FUNC><S>
=	<FUNC><ENTER>
>	<SHIFT><. >
?	<SHIFT><FUNC><D>
@	<FUNC><CTRL><2>

Char	Key Sequence
A	<SHIFT><A>
B	<SHIFT>
C	<SHIFT><C>
D	<SHIFT><D>
E	<SHIFT><E>
F	<SHIFT><F>
G	<SHIFT><G>
H	<SHIFT><H>
I	<SHIFT><I>
J	<SHIFT><J>
K	<SHIFT><K>
L	<SHIFT><L>
M	<SHIFT><M>
N	<SHIFT><N>
O	<SHIFT><O>
P	<SHIFT><P>
Q	<SHIFT><Q>
R	<SHIFT><R>
S	<SHIFT><S>
T	<SHIFT><T>
U	<SHIFT><U>
V	<SHIFT><V>
W	<SHIFT><W>
X	<SHIFT><X>
Y	<SHIFT><Y>
Z	<SHIFT><Z>
[	<FUNC><X>
\	<FUNC><J>
]	<FUNC><Y>
^	<FUNC><CTRL><6>
_	<SHIFT><FUNC><K>
`	<FUNC><H>

Char	Key Sequence
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
i	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><FUNC><X>
|	<SHIFT><FUNC><J>
}	<SHIFT><FUNC><Y>
~	<SHIFT><FUNC><H>
ç ^a	<FUNC><CTRL><Y>
¬	<FUNC><CTRL>
|	<FUNC><CTRL><V>

a. Only for stand-alone client in 5250 mode.

Symbol 3140 and 6140 35-Key Terminals

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the </> and <+> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <SPACE> <FUNC> and <UP-ARROW> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <BKSP> and <SHIFT> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Keyboard State	<ALPHA>
Lamp On/Off	<FUNC><SPACE>
Darker Display	<FUNC><X>
Lighter Display	<FUNC><Z>
Program Information	<FUNC><CTRL><P>
Diagnostics	<FUNC><CTRL><BKSP>
Keyclicks On/Off	<FUNC><CTRL><K>
Quiet Mode On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
Message Recall	<FUNC><CTRL><CLEAR>
Free Cursor Mode	<CTRL><BKSP>
Close Session	<CTRL><C>
Previous Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
View Mode On/Off ^a	<CTRL><F>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>
Switch L/R Scan Button	<FUNC><SCAN BUTTON>

a. The <CTRL> and one of the scroll keys will also enable View Mode.

5250 Emulation Keys

5250 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CTRL><CLEAR>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<CLEAR>
Erase Input	<CTRL><E>
Field Exit	<ENTER>
Field Minus	<CTRL><T>
Help	<CTRL><H>
Home	<CTRL><G>
Insert	<CTRL><I>
Print	<CTRL><P>
Reset	<CTRL>
Roll Up	<CTRL><->
Roll Down	<CTRL><.>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>

5250 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

3270 Emulation Keys

3270 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CLEAR>
Clear EOF	<CTRL><O>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<ENTER>
Erase Input	<CTRL><E>
Field Mark	<CTRL><Q>
Home	<CTRL><G>
Insert	<CTRL><I>
New Line	<CTRL><ENTER>
Reset	<CTRL>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>
PA1	<CTRL><X>
PA2	<CTRL><Z>
PA3	<CTRL><Y>

3270 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

5250/3270 Character Map

Char	Key Sequence
SPACE	<SPACE>
!	<FUNC><CTRL><I>
"	<SHIFT><C>
#	<FUNC><CTRL><3>
\$	<FUNC><CTRL><D>
%	<FUNC><CTRL><5>
&	<FUNC><CTRL><7>
'	<C> ^b
(	<FUNC><CTRL><->
)	<FUNC><CTRL><0>
*	<E>
+	<J>
,	<G>
-	<->
.	<.>
/	<F>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><I>
;	<I>
<	<SHIFT><G>
=	<D>
>	<SHIFT><.>
?	<SHIFT><F>
@	<FUNC><CTRL><A>

Char	Key Sequence
A	<A>
B	<B>
C	<C>
D	<D>
E	<E>
F	<F>
G	<G>
H	<H>
I	<I>
J	<J>
K	<K>
L	<L>
M	<M>
N	<N>
O	<O>
P	<P>
Q	<Q>
R	<R>
S	<S>
T	<T>
U	<U>
V	<V>
W	<W>
X	<X>
Y	<Y>
Z	<Z>
[	<A>
\	<H>
]	
^	<FUNC><CTRL><6>
_	<SHIFT><->
`	<FUNC><J>

Char	Key Sequence
a ^a	N/A
b	N/A
c	N/A
d	N/A
e	N/A
f	N/A
g	N/A
h	N/A
i	N/A
j	N/A
k	N/A
l	N/A
m	N/A
n	N/A
o	N/A
p	N/A
q	N/A
r	N/A
s	N/A
t	N/A
u	N/A
v	N/A
w	N/A
x	N/A
y	N/A
z	N/A
{	<SHIFT><A>
|	<SHIFT><H>
}	<SHIFT>
~	<SHIFT><FUNC><J>
ç ^c	<FUNC><CTRL><J>
¬	<FUNC><CTRL>
|	<FUNC><CTRL><V>

- a. Lowercase alpha characters are not supported.
b. ALPHA off
c. Only for stand-alone client in 5250 mode.

Symbol 3540 47-Key Terminal

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <4> and <5> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <A> and <D> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <F> and <I> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Lamp On/Off	<FUNC><L>
Darker Display	<FUNC><M>
Lighter Display	<FUNC><N>
Program Information	<FUNC><CTRL><P>
Diagnostics	<FUNC><CTRL><D>
Keyclicks On/Off	<FUNC><CTRL><K>
Quiet Mode On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
Message Recall	<CTRL><M>
Free Cursor Mode	<CTRL><Z>
Close Session	<CTRL><C>
Previous Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<FUNC><SHIFT>
View Mode On/Off ^a	<CTRL><Y>
Scroll Left	<W>
Scroll Right	<X>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>
Switch L/R Scan Trigger	<FUNC><SCAN BUTTON>

a. The <CTRL> and one of the scroll keys will also enable View Mode.

5250 Emulation Keys

5250 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CTRL><CLR>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<CLR>
Erase Input	<CTRL><E>
Field Exit	<ENTER>
Field Minus	<SHIFT><ENTER>
Help	<CTRL><H>
Home	<CTRL><G>
Insert	<CTRL><I>
Print	<CTRL><P>
Reset	<CTRL><R>
Roll Up	<CTRL><U>
Roll Down	<CTRL><V>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>

5250 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

3270 Emulation Keys

3270 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CLEAR>
Clear EOF	<CTRL><O>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<ENTER>
Erase Input	<CTRL><E>
Field Mark	<CTRL><F>
Home	<CTRL><G>
Insert	<CTRL><I>
New Line	<CTRL><ENTER>
Reset	<CTRL><R>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>
PA1	<CTRL><U>
PA2	<CTRL><V>
PA3	<CTRL><T>

3270 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

5250/3270 Character Map

Char	Key Sequence
SPACE	<SPACE>
!	<FUNC><CTRL><1>
“	<SHIFT><FUNC><R>
#	<FUNC><CTRL><3>
\$	<FUNC><CTRL><4>
%	<FUNC><CTRL><5>
&	<FUNC><CTRL><7>
'	<FUNC><R>
(	<FUNC><CTRL><9>
)	<FUNC><CTRL><0>
*	<FUNC><C>
+	<FUNC><A>
,	<FUNC><S>
-	<FUNC>
.	<. >
/	<FUNC><D>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><FUNC><O>
;	<FUNC><O>
<	<SHIFT><FUNC><S>
=	<FUNC><ENTER>
>	<SHIFT><. >
?	<SHIFT><FUNC><D>
@	<FUNC><CTRL><2>

Char	Key Sequence
A	<SHIFT><A>
B	<SHIFT>
C	<SHIFT><C>
D	<SHIFT><D>
E	<SHIFT><E>
F	<SHIFT><F>
G	<SHIFT><G>
H	<SHIFT><H>
I	<SHIFT><I>
J	<SHIFT><J>
K	<SHIFT><K>
L	<SHIFT><L>
M	<SHIFT><M>
N	<SHIFT><N>
O	<SHIFT><O>
P	<SHIFT><P>
Q	<SHIFT><Q>
R	<SHIFT><R>
S	<SHIFT><S>
T	<SHIFT><T>
U	<SHIFT><U>
V	<SHIFT><V>
W	<SHIFT><W>
X	<SHIFT><X>
Y	<SHIFT><Y>
Z	<SHIFT><Z>
[	<FUNC><X>
\	<FUNC><J>
]	<FUNC><Y>
^	<FUNC><CTRL><6>
_	<SHIFT><FUNC>
`	<FUNC><H>

Char	Key Sequence
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
i	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><FUNC><X>
|	<SHIFT><FUNC><J>
}	<SHIFT><FUNC><Y>
~	<SHIFT><FUNC><H>
ç ^a	<FUNC><CTRL><Y>
¬	<FUNC><CTRL>
|	<FUNC><CTRL><V>

a. Only for stand-alone client in 5250 mode.

Symbol 6840 35-Key Terminal

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the </> and <+> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <SPACE> <FUNC> and <UP-ARROW> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <BKSP> and <SHIFT> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Keyboard State	<ALPHA>
Lamp On/Off	<FUNC><SPACE>
Darker Display	<FUNC><K>
Lighter Display	<FUNC><L>
Program Information	<FUNC><CTRL><P>
Diagnostics	<FUNC><CTRL><D>
Keyclicks On/Off	<FUNC><CTRL><K>
Quiet Mode On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
Message Recall	<FUNC><CTRL><E>
Free Cursor Mode	<CTRL><BKSP>
Close Session	<CTRL><C>
Previous Session	<FUNC><CTRL><LEFT-ARROW>
Next Session	<FUNC><CTRL><RIGHT-ARROW>
View Mode On/Off ^a	<CTRL><F>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>

a. The <CTRL> and one of the scroll keys will also enable View Mode.

5250 Emulation Keys

5250 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW> or <SHIFT><ALPHA>
Clear	<CTRL><CLEAR>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<CLEAR>
Erase Input	<CTRL><E>
Field Exit	<ENTER>
Field Minus	<CTRL><U>
Help	<CTRL><H>
Home	<CTRL><G>
Insert	<CTRL><I>
Print	<CTRL><R>
Reset	<CTRL>
Roll Up	<CTRL><K>
Roll Down	<CTRL><L>
System Request	<CTRL><S>
Tab	<DOWN-ARROW> or <FUNC><ALPHA>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>

5250 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

3270 Emulation Keys

3270 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW> or <SHIFT><ALPHA>
Clear	<CLEAR>
Clear EOF	<CTRL><Q>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<ENTER>
Erase Input	<CTRL><E>
Field Mark	<CTRL><V>
Home	<CTRL><G>
Insert	<CTRL><I>
New Line	<CTRL><ENTER>
Reset	<CTRL>
System Request	<CTRL><S>
Tab	<DOWN-ARROW> or <FUNC><ALPHA>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>
PA1	<CTRL><K>
PA2	<CTRL><L>
PA3	<CTRL><Z>

3270 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

5250/3270 Character Map

Char	Key Sequence	Char	Key Sequence	Char	Key Sequence
SPACE	<SPACE>	A	<A>	a ^a	N/A
!	<FUNC><CTRL><1>	B		b	N/A
"	<SHIFT><'>	C	<C>	c	N/A
#	<FUNC><CTRL><3>	D	<D>	d	N/A
\$	<FUNC><CTRL><4>	E	<E>	e	N/A
%	<FUNC><CTRL><A>	F	<F>	f	N/A
&	<FUNC><CTRL><7>	G	<G>	g	N/A
'	<'> ^b	H	<H>	h	N/A
(	<FUNC><CTRL><9>	I	<I>	I	N/A
)	<FUNC><CTRL><0>	J	<J>	j	N/A
*	<*>	K	<K>	k	N/A
+	<+>	L	<L>	l	N/A
,	<,>	M	<M>	m	N/A
-	<->	N	<N>	n	N/A
.	<.>	O	<O>	o	N/A
/	</>	P	<P>	p	N/A
0	<0>	Q	<Q>	q	N/A
1	<1>	R	<R>	r	N/A
2	<2>	S	<S>	s	N/A
3	<3>	T	<T>	t	N/A
4	<4>	U	<U>	u	N/A
5	<5>	V	<V>	v	N/A
6	<6>	W	<W>	w	N/A
7	<7>	X	<X>	x	N/A
8	<8>	Y	<Y>	y	N/A
9	<9>	Z	<Z>	z	N/A
:	<SHIFT><:>	[	<[>	{	<SHIFT><[>
;	<:>	\	<\>	|	<SHIFT><\>
<	<SHIFT><,>	]	<]>	}	<SHIFT><]>
=	<=>	^	<FUNC><CTRL><6>	~	<SHIFT><FUNC><J>
>	<SHIFT><.>	_	<SHIFT><->	ç ^c	<FUNC><CTRL><H>
?	<SHIFT></>	`	<FUNC><J>	¬	<FUNC><CTRL>
@	<FUNC><CTRL><2>			|	<FUNC><CTRL><I>

- a. Lowercase alpha characters are not supported.
b. ALPHA off
c. Only for stand-alone client in 5250 mode.

Symbol 3940 and 6940 54-Key Terminals

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <L> and <SHIFT> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <F1> <F4> and <ENTER> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <A> and <D> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Darker Display	<FUNC><M>
Lighter Display	<FUNC><N>
Program Information	<FUNC><CTRL><P>
Diagnostics	<FUNC><CTRL><D>
Keyclicks On/Off	<FUNC><CTRL><K>
Quiet Mode On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
Message Recall	<CTRL><M>
Free Cursor Mode	<CTRL><. >
Close Session	<CTRL><C>
Previous Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<FUNC><SHIFT>
View Mode On/Off ^a	<CTRL><- >
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>

a. The <CTRL> and one of the scroll keys will also enable View Mode.

5250 Emulation Keys

5250 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CTRL><CLEAR>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<CLEAR>
Erase Input	<CTRL><E>
Field Exit	<ENTER>
Field Minus	<SHIFT><ENTER>
Help	<CTRL><H>
Home	<CTRL><G>
Insert	<CTRL><I>
Print	<CTRL><P>
Reset	<CTRL><R>
Roll Up	<CTRL><V>
Roll Down	<CTRL><W>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>

5250 Key	Key Sequence
F1	<FUNC><1> or <F1>
F2	<FUNC><2> or <F2>
F3	<FUNC><3> or <F3>
F4	<FUNC><4> or <F4>
F5	<FUNC><5> or <F5>
F6	<FUNC><6> or <FUNC><F1>
F7	<FUNC><7> or <FUNC><F2>
F8	<FUNC><8> or <FUNC><F3>
F9	<FUNC><9> or <FUNC><F4>
F10	<FUNC><0> or <FUNC><F5>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

3270 Emulation Keys

3270 Key	Key Sequence
Attention	<CTRL><A>
Backspace	<BKSP>
Back Tab	<UP-ARROW>
Clear	<CLEAR>
Clear EOF	<CTRL><O>
Delete	<CTRL><D>
Dup	<CTRL><J>
Enter	<ENTER>
Erase Input	<CTRL><E>
Field Mark	<CTRL><F>
Home	<CTRL><G>
Insert	<CTRL><I>
New Line	<CTRL><ENTER>
Reset	<CTRL><R>
System Request	<CTRL><S>
Tab	<DOWN-ARROW>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>
PA1	<CTRL><V>
PA2	<CTRL><W>
PA3	<CTRL><X>

3270 Key	Key Sequence
F1	<FUNC><1> or <F1>
F2	<FUNC><2> or <F2>
F3	<FUNC><3> or <F3>
F4	<FUNC><4> or <F4>
F5	<FUNC><5> or <F5>
F6	<FUNC><6> or <FUNC><F1>
F7	<FUNC><7> or <FUNC><F2>
F8	<FUNC><8> or <FUNC><F3>
F9	<FUNC><9> or <FUNC><F4>
F10	<FUNC><0> or <FUNC><F5>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

5250/3270 Character Map

Char	Key Sequence
SPACE	<FUNC><BKSP>
!	<FUNC><CTRL><1>
“	<SHIFT><FUNC><R>
#	<FUNC><CTRL><3>
\$	<FUNC><CTRL><4>
%	<FUNC><CTRL><5>
&	<FUNC><CTRL><7>
'	<FUNC><R>
(	<FUNC><CTRL><9>
)	<FUNC><CTRL><0>
*	<FUNC><C>
+	<FUNC><A>
,	<FUNC><S>
-	<->
.	<.>
/	<FUNC><D>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><FUNC><O>
;	<FUNC><O>
<	<SHIFT><FUNC><S>
=	<FUNC><ENTER>
>	<SHIFT><.>
?	<SHIFT><FUNC><D>
@	<FUNC><CTRL><2>

Char	Key Sequence
A	<SHIFT><A>
B	<SHIFT>
C	<SHIFT><C>
D	<SHIFT><D>
E	<SHIFT><E>
F	<SHIFT><F>
G	<SHIFT><G>
H	<SHIFT><H>
I	<SHIFT><I>
J	<SHIFT><J>
K	<SHIFT><K>
L	<SHIFT><L>
M	<SHIFT><M>
N	<SHIFT><N>
O	<SHIFT><O>
P	<SHIFT><P>
Q	<SHIFT><Q>
R	<SHIFT><R>
S	<SHIFT><S>
T	<SHIFT><T>
U	<SHIFT><U>
V	<SHIFT><V>
W	<SHIFT><W>
X	<SHIFT><X>
Y	<SHIFT><Y>
Z	<SHIFT><Z>
[	<FUNC><X>
\	<FUNC><J>
]	<FUNC><Y>
^	<FUNC><CTRL><6>
_	<SHIFT><->
`	<FUNC><H>

Char	Key Sequence
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
I	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><FUNC><X>
|	<SHIFT><FUNC><J>
}	<SHIFT><FUNC><Y>
~	<SHIFT><FUNC><H>
ç ^a	<FUNC><CTRL><Y>
¬	<FUNC><CTRL>
|	<FUNC><CTRL><V>

a. Only for stand-alone client in 5250 mode.

Symbol 1040 27-Key Terminal

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <P1> and <ENTER> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <RIGHT-ARROW> and <ENTER> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <FUNC> and <ENTER> keys. Power on the terminal. Release keys.

Local Terminal Functions¹

Local Function	Key Sequence
Lamp On/Off	<L><HELP>
Darker Display	<FUNC><HELP>
Lighter Display	<SHIFT><HELP>
Program Information	<FUNC><CTRL><R><8>
Diagnostics	<FUNC><CTRL><R><2>
Keyclicks On/Off	<FUNC><CTRL><L><6>
Quiet Mode On/Off	<FUNC><CTRL><L><9>
Terminal Configuration	<FUNC><CTRL><L><2>
Radio Configuration	<FUNC><CTRL><R><9>
Message Recall	<CTRL><L><7>
Free Cursor Mode	<CTRL><R><MENU>
Close Session	<CTRL><L><2>
Caps Lock	<CAPS>
Previous Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
View Mode On/Off ^a	<CTRL><L><MENU>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>

a. The <CTRL> and one of the scroll keys will also enable View Mode.

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

5250 Emulation Keys¹

5250 Key	Key Sequence
Attention	<CTRL><L><1>
Backspace	<BKSP>
Back Tab	<SHIFT><P1>
Clear	<CTRL><CLEAR>
Delete	<CTRL><BKSP>
Dup	<CTRL><R><5>
Enter	<P1>
Erase Input	<FUNC><BKSP>
Field Exit	<ENTER>
Field Minus	<SHIFT><ENTER>
Help	<R><HELP>
Home	<CTRL><L><4>
Insert	<CTRL><L><5>
Print	<CTRL><R><8>
Reset	<CLEAR>
Roll Up	<FUNC> <UP-ARROW>
Roll Down	<FUNC> <DOWN-ARROW>
System Request	<CTRL><L><0>
Tab	<FUNC><P1>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>

5250 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

3270 Emulation Keys¹

3270 Key	Key Sequence
Attention	<CTRL><L><1>
Backspace	<BKSP>
Back Tab	<SHIFT><P1>
Clear	<CLEAR>
Clear EOF	<SHIFT><BKSP>
Delete	<CTRL><BKSP>
Dup	<CTRL><R><5>
Enter	<ENTER>
Erase Input	<FUNC><BKSP>
Field Mark	<FUNC><R><3>
Home	<CTRL><L><4>
Insert	<CTRL><L><5>
New Line	<CTRL><P1>
Reset	<CTRL><CLEAR>
System Request	<CTRL><L><0>
Tab	<P1>
Left Arrow	<LEFT-ARROW>
Right Arrow	<RIGHT-ARROW>
Up Arrow	<UP-ARROW>
Down Arrow	<DOWN-ARROW>
PA1	<CTRL><R><1>
PA2	<CTRL><R><2>
PA3	<CTRL><R><3>

3270 Key	Key Sequence
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15	<SHIFT><5>
F16	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>
F21	<CTRL><1>
F22	<CTRL><2>
F23	<CTRL><3>
F24	<CTRL><4>

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

5250/3270 Character Map¹

Char	Key Sequence	Char	Key Sequence	Char	Key Sequence
SPACE	<SPACE>	A	<SHIFT><L><1>	a	<L><1>
!	<FUNC><CTRL><1>	B	<SHIFT><R><1>	b	<R><1>
"	<SHIFT><FUNC><R><9>	C	<SHIFT><L><2>	c	<L><2>
#	<FUNC><CTRL><3>	D	<SHIFT><R><2>	d	<R><2>
\$	<FUNC><CTRL><4>	E	<SHIFT><L><3>	e	<L><3>
%	<FUNC><CTRL><5>	F	<SHIFT><R><3>	f	<R><3>
&	<FUNC><CTRL><7>	G	<SHIFT><L><4>	g	<L><4>
'	<FUNC><R><9>	H	<SHIFT><R><4>	h	<R><4>
(	<FUNC><CTRL><9>	I	<SHIFT><L><5>	i	<L><5>
)	<FUNC><CTRL><0>	J	<SHIFT><R><5>	j	<R><5>
*	<FUNC><CTRL><8>	K	<SHIFT><L><6>	k	<L><6>
+	<FUNC><L><1>	L	<SHIFT><R><6>	l	<R><6>
,	<FUNC><L><0>	M	<SHIFT><L><7>	m	<L><7>
-	<FUNC><L><6>	N	<SHIFT><R><7>	n	<R><7>
.	<R><P1>	O	<SHIFT><L><8>	o	<L><8>
/	<FUNC><R><2>	P	<SHIFT><R><8>	p	<R><8>
0	<0>	Q	<SHIFT><L><9>	q	<L><9>
1	<1>	R	<SHIFT><R><9>	r	<R><9>
2	<2>	S	<SHIFT><L><0>	s	<L><0>
3	<3>	T	<SHIFT><R><0>	t	<R><0>
4	<4>	U	<SHIFT><L><SPACE>	u	<L><SPACE>
5	<5>	V	<SHIFT><R><SPACE>	v	<R><SPACE>
6	<6>	W	<SHIFT><L><CLEAR>	w	<L><CLEAR>
7	<7>	X	<SHIFT><R><CLEAR>	x	<R><CLEAR>
8	<8>	Y	<SHIFT><L><MENU>	y	<L><MENU>
9	<9>	Z	<SHIFT><R><MENU>	z	<R><MENU>
:	<SHIFT><FUNC><L><8>	[	<FUNC><R><CLEAR>	{	<SHIFT><FUNC><R><CLEAR>
;	<FUNC><L><8>	\	<FUNC><R><5>	|	<SHIFT><FUNC><R><5>
<	<SHIFT><FUNC><L><0>	]	<FUNC><L><MENU>	}	<SHIFT><FUNC><L><MENU>
=	<FUNC><ENTER>	^	<FUNC><CTRL><6>	~	<SHIFT><FUNC><R><4>
>	<SHIFT><R><P1>	_	<SHIFT><FUNC><L><6>	c ^a	<FUNC><CTRL><L><MENU>
?	<SHIFT><FUNC><R><2>	`	<FUNC><R><4>	¬	<FUNC><CTRL><R><1>
@	<FUNC><CTRL><2>			|	<FUNC><CTRL><R><SPACE>

a. Only for stand-alone client in 5250 mode.

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

VT100, VT220 and HP Key Maps

VT 46-Key Terminals

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <4> and <5> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <A> and <D> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <F> and <I> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Lamp On/Off	<FUNC><L>
Darker Display	<FUNC><X>
Lighter Display	<FUNC><Y>
Program Information	<FUNC><CTRL><P>
Keyclicks On/Off	<FUNC><CTRL><K>
Diagnostics	<FUNC><CTRL><D>
Warning Bells On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
VT/HP Terminal Setup	<FUNC><CTRL><T>
Close Session	<FUNC><CTRL><Z>
Prev Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<FUNC><SHIFT>
View Mode On/Off	<FUNC><V>
Scroll Left	<X>
Scroll Right	<Y>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>
Switch L/R Scan Button	<FUNC><SCAN BUTTON>

VT-100 Emulation Keys

VT-100 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
ESC	<CTRL><1>
BS	<CTRL><2>
LF	<CTRL><3>
Hard Terminal Reset	<FUNC><CTRL><O>

VT-100 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>

VT-220 Emulation Keys

VT-220 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Hard Terminal Reset	<FUNC><CTRL><O>
Find	<FUNC><CTRL><F>
Insert Here	<FUNC><CTRL><I>
Prev Screen	<SHIFT> <UP-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>
BREAK ^a	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>

VT-220 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Soft Terminal Reset	<FUNC><CTRL><G>
Select	<FUNC><CTRL><S>
Remove	<FUNC><CTRL><H>
Next Screen	<SHIFT> <DOWN-ARROW>
F11	<CTRL><1>
F12	<CTRL><2>
F13	<CTRL><3>
F14	<CTRL><4>
F15/Help	<CTRL><5>
F16/Do	<CTRL><6>
F17	<CTRL><7>
F18	<CTRL><8>
F19	<CTRL><9>
F20	<CTRL><0>

a. The BREAK key is currently not available.

HP Emulation Keys¹

HP Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW> or <ENTER>
Up Arrow	<UP-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Insert Line	<FUNC><CTRL><F>
Insert Char	<FUNC><CTRL><I>
Hard Terminal Reset	<FUNC><CTRL><O>
Prev	<FUNC><CTRL> <UP-ARROW>
Clear Line	<CTRL><3>
Insert Char with wrap	<CTRL><5>
Scroll Down	<CTRL><7>
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
User Key Menu	<FUNC><0>

HP Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Delete Line	<FUNC><CTRL><S>
Delete Char	<FUNC><CTRL><H>
Soft Terminal Reset	<FUNC><CTRL><G>
Next	<FUNC><CTRL> <DOWN-ARROW>
Clear Display	<CTRL><4>
Delete Char with wrap	<CTRL><6>
Scroll Up	<CTRL><8>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
System Modes Menu	<CTRL><0>

1. The BREAK and STOP keys are currently not available.

VT/HP Character Map

Char	Key Sequence
^@	<CTRL><CLEAR>
^A	<CTRL><A>
^B	<CTRL>
^C	<CTRL><C>
^D	<CTRL><D>
^E	<CTRL><E>
^F	<CTRL><F>
^G	<CTRL><G>
^H	<CTRL><H>
^I	<CTRL><I>
^J	<CTRL><J>
^K	<CTRL><K>
^L	<CTRL><L>
^M	<CTRL><M>
^N	<CTRL><N>
^O	<CTRL><O>
^P	<CTRL><P>
^Q	<CTRL><Q>
^R	<CTRL><R>
^S	<CTRL><S>
^T	<CTRL><T>
^U	<CTRL><U>
^V	<CTRL><V>
^W	<CTRL><W>
^X	<CTRL><X>
^Y	<CTRL><Y>
^Z	<CTRL><Z>
ESC	<CLEAR>
^\ <^_	<CTRL><FUNC><J>
^] <^_	<CTRL><FUNC><N>
^^	<CTRL><FUNC><. >
^_	<CTRL><FUNC><K>
SPACE	<FUNC><BKSP>
!	<SHIFT><1>
“	<SHIFT><FUNC><R>
#	<SHIFT><3>
\$	<SHIFT><4>
%	<SHIFT><5>
&	<SHIFT><7>
'	<FUNC><R>
(	<SHIFT><9>
)	<SHIFT><0>
*	<FUNC><C>

Char	Key Sequence
+	<FUNC><A>
,	<FUNC><U>
-	<FUNC>
.	<. >
/	<FUNC><D>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><FUNC><O>
;	<FUNC><O>
<	<SHIFT><FUNC><U>
=	<FUNC><ENTER>
>	<SHIFT><. >
?	<SHIFT><FUNC><D>
@	<SHIFT><2>
A	<SHIFT><A>
B	<SHIFT>
C	<SHIFT><C>
D	<SHIFT><D>
E	<SHIFT><E>
F	<SHIFT><F>
G	<SHIFT><G>
H	<SHIFT><H>
I	<SHIFT><I>
J	<SHIFT><J>
K	<SHIFT><K>
L	<SHIFT><L>
M	<SHIFT><M>
N	<SHIFT><N>
O	<SHIFT><O>
P	<SHIFT><P>
Q	<SHIFT><Q>
R	<SHIFT><R>
S	<SHIFT><S>
T	<SHIFT><T>
U	<SHIFT><U>

Char	Key Sequence
V	<SHIFT><V>
W	<SHIFT><W>
X	<SHIFT><X>
Y	<SHIFT><Y>
Z	<SHIFT><Z>
[	<FUNC><M>
\	<FUNC><J>
]	<FUNC><N>
^	<SHIFT><6>
_	<SHIFT><FUNC><K>
`	<FUNC><G>
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
I	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><FUNC><M>
|	<SHIFT><FUNC><J>
}	<SHIFT><FUNC><N>
~	<SHIFT><FUNC><G>
DEL	<CTRL><BKSP>

VT 3140 and 6140 35-Key

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the </> and <+> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <SPACE> <FUNC> and <UP-ARROW> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <BKSP> and <SHIFT> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Keyboard State	<ALPHA>
Lamp On/Off	<FUNC><L>
Darker Display	<FUNC><X>
Lighter Display	<FUNC><Z>
Program Information	<FUNC><CTRL><P>
Keyclicks On/Off	<FUNC><CTRL><K>
Warning Bells On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
VT/HP Terminal Setup	<FUNC><CTRL><T>
Prev Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Close Session	<FUNC><CTRL><Z>
View Mode On/Off	<FUNC><CTRL><V>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>
Switch L/R Scan Button	<FUNC><SCAN BUTTON>

VT-100 Emulation Keys

VT-100 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<FUNC><SPACE>
Up Arrow	<UP-ARROW> ^a
Left Arrow	<LEFT-ARROW>
ESC	<SHIFT><1>
BS	<SHIFT><2>
LF	<SHIFT><3>
Hard Terminal Reset	<FUNC><CTRL><O>

a. ALPHA off

VT-100 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<SHIFT><FUNC> <SPACE>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>

VT-220 Emulation Keys

VT-220 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<FUNC><SPACE>
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
Hard Terminal Reset	<FUNC><CTRL><O>
Find	<FUNC><CTRL><F>
Insert Here	<FUNC><CTRL><I>
Prev Screen	<SHIFT> <UP-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>
BREAK ^a	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>

a. The BREAK key is currently not available.

VT-220 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<SHIFT><FUNC> <SPACE>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Soft Terminal Reset	<FUNC><CTRL><G>
Select	<FUNC><CTRL><A>
Remove	<FUNC><CTRL><J>
Next Screen	<SHIFT> <DOWN-ARROW>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15/Help	<SHIFT><5>
F16/Do	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>

HP Emulation Keys¹

HP Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<FUNC><SPACE> or <ENTER> ^a
Up Arrow	<UP-ARROW> ^b
Left Arrow	<LEFT-ARROW>
Insert Line	<FUNC><CTRL><F>
Insert Char	<FUNC><CTRL><I>
Hard Terminal Reset	<FUNC><CTRL><O>
Prev	<SHIFT><UP-ARROW>
Clear Line	<SHIFT><3>
Insert Char with wrap	<SHIFT><5>
Scroll Down	<SHIFT><7>
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
User Key Menu	<FUNC><0>

a. Format mode only.

b. ALPHA off

HP Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<SHIFT><FUNC> <SPACE>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Delete Line	<FUNC><CTRL><A>
Delete Char	<FUNC><CTRL><J>
Soft Terminal Reset	<FUNC><CTRL><G>
Next	<SHIFT><DOWN- ARROW>
Clear Display	<SHIFT><4>
Delete Char with wrap	<SHIFT><6>
Scroll Up	<SHIFT><8>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
System Modes Menu	<SHIFT><0>

1. The BREAK and STOP keys are currently not available.

VT/HP Character Map¹

Char	Key Sequence
^@	<CTRL><CLEAR>
^A	<CTRL><A>
^B	<CTRL>
^C	<CTRL><C>
^D	<CTRL><D>
^E	<CTRL><E>
^F	<CTRL><F>
^G	<CTRL><G>
^H	<CTRL><H>
^I	<CTRL><I>
^J	<CTRL><J>
^K	<CTRL><K>
^L	<CTRL><L>
^M	<CTRL><M>
^N	<CTRL><N>
^O	<CTRL><O>
^P	<CTRL><P>
^Q	<CTRL><Q>
^R	<CTRL><R>
^S	<CTRL><S>
^T	<CTRL><T>
^U	<CTRL><U>
^V	<CTRL><V>
^W	<CTRL><W>
^X	<CTRL><X>
^Y	<CTRL><Y>
^Z	<CTRL><Z>
ESC	<CLEAR>
^\ <^_	<CTRL><FUNC><H>
^] <^_	<CTRL><FUNC>
^^ <^_	<CTRL><FUNC><A>
^_ <^_	<CTRL><FUNC><C>
SPACE	<SPACE>
!	<SHIFT><FUNC><D>
"	<SHIFT><C>
#	<SHIFT><FUNC><E>
\$	<SHIFT><FUNC><F>
%	<SHIFT><FUNC><G>
&	<SHIFT><FUNC><I>
'	<C> ^a
(	<SHIFT><FUNC><K>
)	<SHIFT><FUNC><M>
*	<E>

a. ALPHA off

Char	Key Sequence
+	<J>
,	<G>
-	<X>
.	<Z>
/	<F>
0	<Y>
1	<U>
2	<V>
3	<W>
4	<R>
5	<S>
6	<T>
7	<O>
8	<P>
9	<Q>
:	<SHIFT><I>
;	<I>
<	<SHIFT><G>
=	<D>
>	<SHIFT><Z>
?	<SHIFT><F>
@	<SHIFT><FUNC><BKSP>
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	

Char	Key Sequence
V	
W	
X	
Y	
Z	
[	<A>
\	<H>
]	
^	<SHIFT><FUNC><A>
_	<SHIFT><X>
`	<FUNC><J>
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
I	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><A>
|	<SHIFT><H>
}	<SHIFT>
~	<SHIFT><FUNC><J>
DEL	<CTRL><BKSP>

1. Uppercase letters are not supported.

VT 3540 47-Key Terminal

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <4> and <5> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <A> and <D> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <F> and <I> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Lamp On/Off	<FUNC><L>
Darker Display	<FUNC><X>
Lighter Display	<FUNC><Y>
Diagnostic Menu	<FUNC><CTRL><D>
Program Information	<FUNC><CTRL><P>
Keyclicks On/Off	<FUNC><CTRL><K>
Warning Bells On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
VT/HP Terminal Setup	<FUNC><CTRL><T>
Close Session	<FUNC><CTRL><Z>
Prev Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<FUNC><SHIFT>
View Mode On/Off	<FUNC><V>
Scroll Left	<W>
Scroll Right	<X>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>
Switch L/R Scan Buttons	<FUNC><SCAN BUTTON>

VT-100 Emulation Keys

VT-100 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
ESC	<CTRL><1>
BS	<CTRL><2>
LF	<CTRL><3>
Hard Terminal Reset	<FUNC><CTRL><O>

VT-100 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>

VT-220 Emulation Keys

VT-220 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Hard Terminal Reset	<FUNC><CTRL><O>
Find	<FUNC><CTRL><F>
Insert Here	<FUNC><CTRL><I>
Prev Screen	<SHIFT> <UP-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>
BREAK ^a	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>

a. The BREAK key is currently not available.

VT-220 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Soft Terminal Reset	<FUNC><CTRL><G>
Select	<FUNC><CTRL><S>
Remove	<FUNC><CTRL><H>
Next Screen	<SHIFT> <DOWN-ARROW>
F11	<CTRL><1>
F12	<CTRL><2>
F13	<CTRL><3>
F14	<CTRL><4>
F15/Help	<CTRL><5>
F16/Do	<CTRL><6>
F17	<CTRL><7>
F18	<CTRL><8>
F19	<CTRL><9>
F20	<CTRL><0>

HP Emulation Keys¹

HP Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW> or <ENTER> ^a
Up Arrow	<UP-ARROW>
Left Arrow	<FUNC> <UP-ARROW>
Insert Line	<FUNC><CTRL><F>
Insert Char	<FUNC><CTRL><I>
Hard Terminal Reset	<FUNC><CTRL><O>
Prev	<SHIFT> <UP-ARROW>
Clear Line	<CTRL><3>
Insert Char with wrap	<CTRL><5>
Scroll Down	<CTRL><7>
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
User Key Menu	<FUNC><0>

a. Format mode only.

HP Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<FUNC> <DOWN-ARROW>
Delete Line	<FUNC><CTRL><S>
Delete Char	<FUNC><CTRL><H>
Soft Terminal Reset	<FUNC><CTRL><G>
Next	<SHIFT> <DOWN-ARROW>
Clear Display	<CTRL><4>
Delete Char with wrap	<CTRL><6>
Scroll Up	<CTRL><8>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
System Modes Menu	<CTRL><0>

1. The BREAK and STOP keys are currently not available.

VT/HP Character Map

Char	Key Sequence
^@	<CTRL><CLR>
^A	<CTRL><A>
^B	<CTRL>
^C	<CTRL><C>
^D	<CTRL><D>
^E	<CTRL><E>
^F	<CTRL><F>
^G	<CTRL><G>
^H	<CTRL><H>
^I	<CTRL><I>
^J	<CTRL><J>
^K	<CTRL><K>
^L	<CTRL><L>
^M	<CTRL><M>
^N	<CTRL><N>
^O	<CTRL><O>
^P	<CTRL><P>
^Q	<CTRL><Q>
^R	<CTRL><R>
^S	<CTRL><S>
^T	<CTRL><T>
^U	<CTRL><U>
^V	<CTRL><V>
^W	<CTRL><W>
^X	<CTRL><X>
^Y	<CTRL><Y>
^Z	<CTRL><Z>
ESC	<CLR>
^\	<CTRL><FUNC><J>
^]	<CTRL><FUNC><N>
^^	<CTRL><FUNC><. >
^_	<CTRL><FUNC><K>
SPACE	<SPACE>
!	<SHIFT><1>
“	<SHIFT><FUNC><R>
#	<SHIFT><3>
\$	<SHIFT><4>
%	<SHIFT><5>
&	<SHIFT><7>
'	<FUNC><R>
(	<SHIFT><9>
)	<SHIFT><0>
*	<FUNC><C>

Char	Key Sequence
+	<FUNC><A>
,	<FUNC><U>
-	<FUNC>
.	<. >
/	<FUNC><D>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><FUNC><O>
;	<FUNC><O>
<	<SHIFT><FUNC><U>
=	<FUNC><ENTER>
>	<SHIFT><. >
?	<SHIFT><FUNC><D>
@	<SHIFT><2>
A	<SHIFT><A>
B	<SHIFT>
C	<SHIFT><C>
D	<SHIFT><D>
E	<SHIFT><E>
F	<SHIFT><F>
G	<SHIFT><G>
H	<SHIFT><H>
I	<SHIFT><I>
J	<SHIFT><J>
K	<SHIFT><K>
L	<SHIFT><L>
M	<SHIFT><M>
N	<SHIFT><N>
O	<SHIFT><O>
P	<SHIFT><P>
Q	<SHIFT><Q>
R	<SHIFT><R>
S	<SHIFT><S>
T	<SHIFT><T>
U	<SHIFT><U>

Char	Key Sequence
V	<SHIFT><V>
W	<SHIFT><W>
X	<SHIFT><X>
Y	<SHIFT><Y>
Z	<SHIFT><Z>
[	<FUNC><M>
\	<FUNC><J>
]	<FUNC><N>
^	<SHIFT><6>
_	<SHIFT><FUNC><K>
`	<FUNC><G>
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
I	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><FUNC><M>
|	<SHIFT><FUNC><J>
}	<SHIFT><FUNC><N>
~	<SHIFT><FUNC><G>
DEL	<CTRL><BKSP>

VT 6840 35-Key Terminal

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the </> and <+> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <SPACE> <FUNC> and <UP-ARROW> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <BKSP> and <SHIFT> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Keyboard State	<ALPHA>
Lamp On/Off	<FUNC><L>
Darker Display	<FUNC><H>
Lighter Display	<FUNC><G>
Program Information	<FUNC><CTRL><P>
Keyclicks On/Off	<FUNC><CTRL><K>
Warning Bells On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
VT/HP Terminal Setup	<FUNC><CTRL><T>
Prev Session	<FUNC><CTRL><LEFT-ARROW>
Next Session	<FUNC><CTRL><RIGHT-ARROW>
Close Session	<FUNC><CTRL><Z>
View Mode On/Off	<FUNC><CTRL><V>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>

VT-100 Emulation Keys

VT-100 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<FUNC><SPACE>
Up Arrow	<UP-ARROW> ^a
Left Arrow	<LEFT-ARROW>
ESC	<SHIFT><1>
BS	<SHIFT><2>
LF	<SHIFT><3>
Hard Terminal Reset	<FUNC><CTRL><O>

a. ALPHA off

VT-100 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<SHIFT><FUNC> <SPACE>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>

VT-220 Emulation Keys

VT-220 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<FUNC><SPACE>
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
Hard Terminal Reset	<FUNC><CTRL><O>
Find	<FUNC><CTRL><F>
Insert Here	<FUNC><CTRL><I>
Prev Screen	<SHIFT><UP-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>
BREAK ^a	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>

a. The BREAK key is currently not available.

VT-220 Key	Key Sequence
Enter	<CTRL><ENTER>
Backtab	<SHIFT><FUNC> <SPACE>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Soft Terminal Reset	<FUNC><CTRL><G>
Select	<FUNC><CTRL><A>
Remove	<FUNC><CTRL><J>
Next Screen	<SHIFT> <DOWN-ARROW>
F11	<SHIFT><1>
F12	<SHIFT><2>
F13	<SHIFT><3>
F14	<SHIFT><4>
F15/Help	<SHIFT><5>
F16/Do	<SHIFT><6>
F17	<SHIFT><7>
F18	<SHIFT><8>
F19	<SHIFT><9>
F20	<SHIFT><0>

HP Emulation Keys¹

HP Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<FUNC><SPACE> or <ENTER> ^a
Up Arrow	<UP-ARROW> ^b
Left Arrow	<LEFT-ARROW>
Insert Line	<FUNC><CTRL><F>
Insert Char	<FUNC><CTRL><I>
Hard Terminal Reset	<FUNC><CTRL><O>
Prev	<FUNC><CTRL><M>
Clear Line	<SHIFT><3>
Insert Char with wrap	<SHIFT><5>
Scroll Down	<SHIFT><7>
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
User Key Menu	<FUNC><0>

a. Format mode only.

b. ALPHA off

HP Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<SHIFT><FUNC> <SPACE>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Delete Line	<FUNC><CTRL><A>
Delete Char	<FUNC><CTRL><J>
Soft Terminal Reset	<FUNC><CTRL><G>
Next	<FUNC><CTRL><N>
Clear Display	<SHIFT><4>
Delete Char with wrap	<SHIFT><6>
Scroll Up	<SHIFT><8>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
System Modes Menu	<SHIFT><0>

1. The BREAK and STOP keys are currently not available.

VT/HP Character Map¹

Char	Key Sequence
^@	<CTRL><CLEAR>
^A	<CTRL><A>
^B	<CTRL>
^C	<CTRL><C>
^D	<CTRL><D>
^E	<CTRL><E>
^F	<CTRL><F>
^G	<CTRL><G>
^H	<CTRL><H>
^I	<CTRL><I>
^J	<CTRL><J>
^K	<CTRL><K>
^L	<CTRL><L>
^M	<CTRL><M>
^N	<CTRL><N>
^O	<CTRL><O>
^P	<CTRL><P>
^Q	<CTRL><Q>
^R	<CTRL><R>
^S	<CTRL><S>
^T	<CTRL><T>
^U	<CTRL><U>
^V	<CTRL><V>
^W	<CTRL><W>
^X	<CTRL><X>
^Y	<CTRL><Y>
^Z	<CTRL><Z>
ESC	<CLEAR>
^\ <^_>	<CTRL><FUNC><K>
^] <^_>	<CTRL><FUNC>
^^ <^_>	<CTRL><FUNC><A>
^_ <^_>	<CTRL><FUNC><C>
SPACE	<SPACE>
!	<SHIFT><FUNC><D>
"	<SHIFT><'>
#	<SHIFT><FUNC><E>
\$	<SHIFT><FUNC><F>
%	<SHIFT><FUNC><I>
&	<SHIFT><FUNC><J>
'	<'> ^a
(	<SHIFT><FUNC><M>
)	<SHIFT><FUNC><N>
*	<*>

a. ALPHA off

Char	Key Sequence
+	<+>
,	<,>
-	<->
.	<.>
/	</>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><L>
;	<,>
<	<SHIFT><J>
=	<=>
>	<SHIFT><I>
?	<SHIFT><F>
@	<SHIFT><FUNC><BKSP>
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	

Char	Key Sequence
V	
W	
X	
Y	
Z	
[<[>
\	<\>
]	<]>
^	<SHIFT><FUNC><O>
_	<SHIFT><->
`	<FUNC><P>
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
I	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><A>
|	<SHIFT><K>
}	<SHIFT>
~	<SHIFT><FUNC><P>
DEL	<CTRL><BKSP>

1. Uppercase letters are not supported.

VT 3940 and 6940 54-Key Terminals

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <L> and <SHIFT> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <F1> <F4> and <ENTER> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <A> and <D> keys. Power on the terminal. Release keys.

Local Terminal Functions

Local Function	Key Sequence
Darker Display	<FUNC><I>
Lighter Display	<FUNC><J>
Program Information	<FUNC><CTRL><P>
Keyclicks On/Off	<FUNC><CTRL><K>
Diagnostic Menu	<FUNC><CTRL><D>
Warning Bells On/Off	<FUNC><CTRL><Q>
Terminal Configuration	<FUNC><CTRL><C>
Radio Configuration	<FUNC><CTRL><R>
VT/HP Terminal Setup	<FUNC><CTRL><T>
Close Session	<FUNC><CTRL><Z>
Prev Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<FUNC><SHIFT>
View Mode On/Off	<FUNC><V>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>

VT-100 Emulation Keys

VT-100 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
ESC	<CTRL><1> or <CTRL><F1>
BS	<CTRL><2> or <CTRL><F2>
LF	<CTRL><3> or <CTRL><F3>
Hard Terminal Reset	<FUNC><CTRL><O>

VT-100 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
PF1	<FUNC><1> or <F1>
PF2	<FUNC><2> or <F2>
PF3	<FUNC><3> or <F3>
PF4	<FUNC><4> or <F4>

VT-220 Emulation Keys

VT-220 Key	Key Sequence
Return	<ENTER>
Backspace (Delete)	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
Hard Terminal Reset	<FUNC><CTRL><O>
Find	<FUNC><CTRL><F>
Insert Here	<FUNC><CTRL><I>
Prev Screen	<SHIFT> <UP-ARROW>
PF1	<FUNC><1> or <F1>
PF2	<FUNC><2> or <F2>
PF3	<FUNC><3> or <F3>
PF4	<FUNC><4> or <F4>
BREAK ^a	<FUNC><5> or <F5>
F6	<FUNC><6> or <FUNC><F1>
F7	<FUNC><7> or <FUNC><F2>
F8	<FUNC><8> or <FUNC><F3>
F9	<FUNC><9> or <FUNC><F4>
F10	<FUNC><0> or <FUNC><F5>

a. The BREAK key is currently not available.

VT-220 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Soft Terminal Reset	<FUNC><CTRL><G>
Select	<FUNC><CTRL><S>
Remove	<FUNC><CTRL><H>
Next Screen	<SHIFT> <DOWN-ARROW>
F11	<CTRL><1> or <CTRL><F1>
F12	<CTRL><2> or <CTRL><F2>
F13	<CTRL><3> or <CTRL><F3>
F14	<CTRL><4> or <CTRL><F4>
F15/Help	<CTRL><5> or <CTRL><F5>
F16/Do	<CTRL><6> or <CTRL><FUNC><F1>
F17	<CTRL><7> or <CTRL><FUNC><F2>
F18	<CTRL><8> or <CTRL><FUNC><F3>
F19	<CTRL><9> or <CTRL><FUNC><F4>
F20	<CTRL><0> or <CTRL><FUNC><F5>

HP Emulation Keys¹

HP Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW> or <ENTER> ^a
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
Insert Line	<FUNC><CTRL><F>
Insert Char	<FUNC><CTRL><I>
Hard Terminal Reset	<FUNC><CTRL><O>
Prev	<SHIFT> <UP-ARROW>
Clear Line	<CTRL><3>
Insert Char with wrap	<CTRL><5>
Scroll Down	<CTRL><7>
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
User Key Menu	<FUNC><0>

a. Format mode only.

HP Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Delete Line	<FUNC><CTRL><S>
Delete Char	<FUNC><CTRL><H>
Soft Terminal Reset	<FUNC><CTRL><G>
Next	<SHIFT> <DOWN-ARROW>
Clear Display	<CTRL><4>
Delete Char with wrap	<CTRL><6>
Scroll Up	<CTRL><8>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
System Modes Menu	<CTRL><0>

1. The BREAK and STOP keys are currently not available.

VT/HP Character Map

Char	Key Sequence
^@	<CTRL><CLEAR>
^A	<CTRL><A>
^B	<CTRL>
^C	<CTRL><C>
^D	<CTRL><D>
^E	<CTRL><E>
^F	<CTRL><F>
^G	<CTRL><G>
^H	<CTRL><H>
^I	<CTRL><I>
^J	<CTRL><J>
^K	<CTRL><K>
^L	<CTRL><L>
^M	<CTRL><M>
^N	<CTRL><N>
^O	<CTRL><O>
^P	<CTRL><P>
^Q	<CTRL><Q>
^R	<CTRL><R>
^S	<CTRL><S>
^T	<CTRL><T>
^U	<CTRL><U>
^V	<CTRL><V>
^W	<CTRL><W>
^X	<CTRL><X>
^Y	<CTRL><Y>
^Z	<CTRL><Z>
ESC	<CLEAR>
^\ <^_	<CTRL><FUNC>
^] <^_	<CTRL><FUNC><D>
^^	<CTRL><FUNC><. >
^_ <^_	<CTRL><FUNC><- >
SPACE	<FUNC><BKSP>
!	<SHIFT><1>
"	<SHIFT><FUNC><F>
#	<SHIFT><3>
\$	<SHIFT><4>
%	<SHIFT><5>
&	<SHIFT><7>
'	<FUNC><F>
(	<SHIFT><9>
)	<SHIFT><0>
*	<FUNC><W>

Char	Key Sequence
+	<FUNC><U>
,	<FUNC><M>
-	<- >
.	<. >
/	<FUNC><X>
0	<0>
1	<1>
2	<2>
3	<3>
4	<4>
5	<5>
6	<6>
7	<7>
8	<8>
9	<9>
:	<SHIFT><FUNC><E>
;	<FUNC><E>
<	<SHIFT><FUNC><M>
=	<FUNC><ENTER>
>	<SHIFT><. >
?	<SHIFT><FUNC><X>
@	<SHIFT><2>
A	<SHIFT><A>
B	<SHIFT>
C	<SHIFT><C>
D	<SHIFT><D>
E	<SHIFT><E>
F	<SHIFT><F>
G	<SHIFT><G>
H	<SHIFT><H>
I	<SHIFT><I>
J	<SHIFT><J>
K	<SHIFT><K>
L	<SHIFT><L>
M	<SHIFT><M>
N	<SHIFT><N>
O	<SHIFT><O>
P	<SHIFT><P>
Q	<SHIFT><Q>
R	<SHIFT><R>
S	<SHIFT><S>
T	<SHIFT><T>
U	<SHIFT><U>

Char	Key Sequence
V	<SHIFT><V>
W	<SHIFT><W>
X	<SHIFT><X>
Y	<SHIFT><Y>
Z	<SHIFT><Z>
[	<FUNC><C>
\	<FUNC>
]	<FUNC><D>
^	<SHIFT><6>
_	<SHIFT><- >
`	<FUNC><A>
a	<A>
b	<B>
c	<C>
d	<D>
e	<E>
f	<F>
g	<G>
h	<H>
I	<I>
j	<J>
k	<K>
l	<L>
m	<M>
n	<N>
o	<O>
p	<P>
q	<Q>
r	<R>
s	<S>
t	<T>
u	<U>
v	<V>
w	<W>
x	<X>
y	<Y>
z	<Z>
{	<SHIFT><FUNC><C>
	<SHIFT><FUNC>
}	<SHIFT><FUNC><D>
~	<SHIFT><FUNC><A>
DEL	<CTRL><BKSP>

VT 1040 27-Key Terminal

Booting Procedures

Boot Type	Procedure
Warm Boot	Power off the terminal. Hold down the <P1> and <ENTER> keys. Power on the terminal. Release keys.
Cold Boot	Power off the terminal. Hold down the <RIGHT-ARROW> and <ENTER> keys. Power on the terminal. Release keys.
Command Mode Boot	Power off the terminal. Hold down the <FUNC> and <ENTER> keys. Power on the terminal. Release keys.

Local Terminal Functions¹

Local Function	Key Sequence
Lamp On/Off	<L><MENU>
Darker Display	<FUNC><R><CLEAR>
Lighter Display	<FUNC><L><MENU>
Program Information	<FUNC><CTRL><R><8>
Keyclicks On/Off	<FUNC><CTRL><L><6>
Warning Bells On/Off	<FUNC><CTRL><L><9>
Terminal Configuration	<FUNC><CTRL><L><2>
Radio Configuration	<FUNC><CTRL><R><9>
VT/HP Terminal Setup	<FUNC><CTRL><R><0>
Close Session	<FUNC><CTRL><R><MENU>
Prev Session	<FUNC><CTRL><UP-ARROW>
Next Session	<FUNC><CTRL><DOWN-ARROW>
Caps Lock	<CAPS>
View Mode On/Off	<FUNC><R><SPACE>
Scroll Left	<LEFT-ARROW>
Scroll Right	<RIGHT-ARROW>
Scroll Up	<UP-ARROW>
Scroll Down	<DOWN-ARROW>

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

VT-100 Emulation Keys¹

VT-100 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
ESC	<CTRL><1>
BS	<CTRL><2>
LF	<CTRL><3>
Hard Terminal Reset	<FUNC><CTRL> <L><8>

VT-100 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>

VT-220 Emulation Keys

VT-220 Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW>
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
Hard Terminal Reset	<FUNC><CTRL> <L><8>
Find	<FUNC><CTRL> <R><3>
Insert Here	<FUNC><CTRL> <L><5>
Prev Screen	<SHIFT><UP-ARROW>
PF1	<FUNC><1>
PF2	<FUNC><2>
PF3	<FUNC><3>
PF4	<FUNC><4>
BREAK ^a	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
F9	<FUNC><9>
F10	<FUNC><0>

VT-220 Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Soft Terminal Reset	<FUNC><CTRL> <L><4>
Select	<FUNC><CTRL> <L><0>
Remove	<FUNC><CTRL> <R><4>
Next Screen	<SHIFT> <DOWN-ARROW>
F11	<CTRL><1>
F12	<CTRL><2>
F13	<CTRL><3>
F14	<CTRL><4>
F15/Help	<CTRL><5>
F16/Do	<CTRL><6>
F17	<CTRL><7>
F18	<CTRL><8>
F19	<CTRL><9>
F20	<CTRL><0>

a. The BREAK key is currently not available.

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

HP Emulation Keys¹

HP Key	Key Sequence
Return	<ENTER>
Backspace	<BKSP>
Tab	<CTRL> <DOWN-ARROW> or <ENTER> ^a
Up Arrow	<UP-ARROW>
Left Arrow	<LEFT-ARROW>
Insert Line	<FUNC><CTRL> <R><3>
Insert Char	<FUNC><CTRL> <L><5>
Hard Terminal Reset	<FUNC><CTRL> <L><8>
Prev	<SHIFT> <UP-ARROW>
Clear Line	<CTRL><3>
Insert Char with wrap	<CTRL><5>
Scroll Down	<CTRL><7>
F1	<FUNC><1>
F2	<FUNC><2>
F3	<FUNC><3>
F4	<FUNC><4>
User Key Menu	<FUNC><0>

a. Format mode only.

HP Key	Key Sequence
Enter	<CTRL><ENTER>
Delete	<CTRL><BKSP>
Backtab	<CTRL> <UP-ARROW>
Down Arrow	<DOWN-ARROW>
Right Arrow	<RIGHT-ARROW>
Delete Line	<FUNC><CTRL> <L><0>
Delete Char	<FUNC><CTRL> <R><4>
Soft Terminal Reset	<FUNC><CTRL> <L><4>
Next	<SHIFT> <DOWN-ARROW>
Clear Display	<CTRL><4>
Delete Char with wrap	<CTRL><6>
Scroll Up	<CTRL><8>
F5	<FUNC><5>
F6	<FUNC><6>
F7	<FUNC><7>
F8	<FUNC><8>
System Modes Menu	<CTRL><0>

1. The BREAK and STOP keys are currently not available.

VT/HP Character Map¹

Char	Key Sequence	Char	Key Sequence
^@	<CTRL><CLEAR>	@	<SHIFT><2>
^A	<CTRL><L><1>	A	<SHIFT><L><1>
^B	<CTRL><R><1>	B	<SHIFT><R><1>
^C	<CTRL><L><2>	C	<SHIFT><L><2>
^D	<CTRL><R><2>	D	<SHIFT><R><2>
^E	<CTRL><L><3>	E	<SHIFT><L><3>
^F	<CTRL><R><3>	F	<SHIFT><R><3>
^G	<CTRL><L><4>	G	<SHIFT><L><4>
^H	<CTRL><R><4>	H	<SHIFT><R><4>
^I	<CTRL><L><5>	I	<SHIFT><L><5>
^J	<CTRL><R><5>	J	<SHIFT><R><5>
^K	<CTRL><L><6>	K	<SHIFT><L><6>
^L	<CTRL><R><6>	L	<SHIFT><R><6>
^M	<CTRL><L><7>	M	<SHIFT><L><7>
^N	<CTRL><R><7>	N	<SHIFT><R><7>
^O	<CTRL><L><8>	O	<SHIFT><L><8>
^P	<CTRL><R><8>	P	<SHIFT><R><8>
^Q	<CTRL><L><9>	Q	<SHIFT><L><9>
^R	<CTRL><R><9>	R	<SHIFT><R><9>
^S	<CTRL><L><0>	S	<SHIFT><L><0>
^T	<CTRL><R><0>	T	<SHIFT><R><0>
^U	<CTRL><L><SPACE>	U	<SHIFT><L><SPACE>
^V	<CTRL><R><SPACE>	V	<SHIFT><R><SPACE>
^W	<CTRL><L><CLEAR>	W	<SHIFT><L><CLEAR>
^X	<CTRL><R><CLEAR>	X	<SHIFT><R><CLEAR>
^Y	<CTRL><L><MENU>	Y	<SHIFT><L><MENU>
^Z	<CTRL><R><MENU>	Z	<SHIFT><R><MENU>
ESC	<CLEAR>	[	<FUNC><L><7>
^\ <ESC>	<CTRL><FUNC><R><5>	\	<FUNC><R><5>
^] <ESC>	<CTRL><FUNC><R><7>	]	<FUNC><R><7>
^^	<CTRL><P1>	^	<SHIFT><6>
^_ <ESC>	<CTRL><FUNC><L><6>	_	<SHIFT><FUNC><L><6>
SPACE	<SPACE>	^	<FUNC><L><4>
!	<SHIFT><1>	a	<L><1>
“	<SHIFT><FUNC><R><9>	b	<R><1>

1. All references to <L> are references to the purple colored key on the left side of the keypad; all references to <R> are references to the green colored key on the right side of the keypad.

#	<SHIFT><3>	c	<L><2>
\$	<SHIFT><4>	d	<R><2>
%	<SHIFT><5>	e	<L><3>
&	<SHIFT><7>	f	<R><3>
'	<FUNC><R><9>	g	<L><4>
(	<SHIFT><9>	h	<R><4>
)	<SHIFT><0>	I	<L><5>
*	<FUNC><L><2>	j	<R><5>
+	<FUNC><L><1>	k	<L><6>
,	<FUNC><L><SPACE>	l	<R><6>
-	<FUNC><R><1>	m	<L><7>
.	<R><P1>	n	<R><7>
/	<FUNC><R><2>	o	<L><8>
0	<0>	p	<R><8>
1	<1>	q	<L><9>
2	<2>	r	<R><9>
3	<3>	s	<L><0>
4	<4>	t	<R><0>
5	<5>	u	<L><SPACE>
6	<6>	v	<R><SPACE>
7	<7>	w	<L><CLEAR>
8	<8>	x	<R><CLEAR>
9	<9>	y	<L><MENU>
:	<SHIFT><FUNC><L><8>	z	<R><MENU>
;	<FUNC><L><8>	{	<SHIFT><FUNC><L><7>
<	<SHIFT><FUNC> <L><SPACE>	|	<SHIFT><FUNC><R><5>
=	<FUNC><ENTER>	}	<SHIFT><FUNC><R><7>
>	<SHIFT><P1>	~	<SHIFT><FUNC><L><4>
?	<SHIFT><FUNC><R><2>	DEL	<CTRL><BKSP>

Troubleshooting

This section is designed to assist system administrators with the most common problems encountered when using the Avalanche product. The first portion of this appendix displays a summary of problems while the second portion provides additional details to resolve them. The summary is grouped in the following manner.

- Problems Downloading a Hex File - *Page C-115*
- Problems Synchronizing with the Console - *Page C-117*
- Enabler Configuration Problems - *Page C-119*
- Host Communication Problems - *Page C-120*

Problems Downloading a HEX File

Problem:

Download button is gray or not enabled on the Download HEX files dialog box.

Possible Cause:

- Incorrect Port Selected
- No hex file selected

Problem:

Download button is gray or not enabled on the communications port dialog box (See Figure A.1).

Possible Cause:

- Null modem cable is not found, not connected properly, defective or damaged.
- Cradle is not powered or powered with the wrong power supply.
- The RF terminal is not seated properly within the cradle.

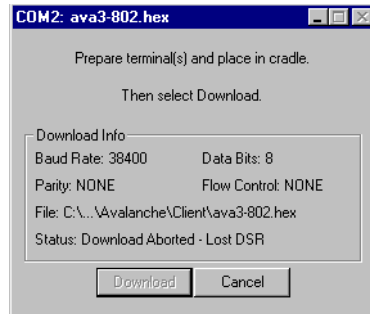


Figure A.1 Communications Port Dialog Box with Configuration Problem

Problem:

Download button is gray or not enabled on the communications port dialog box on the Avalanche Manager (See Figure A.1). Awaiting DSR appears momentarily on the RF terminal and then Status 0020 is displayed.

Possible Cause:

- A straight through cable is employed rather than a null modem cable..

Problem:

Communications port dialog box on the Avalanche Manager displays a status of "Download Aborted - Lost DSR" and the terminal shows a status of 0004.

Possible Cause:

- The parity setting on the RF terminal does not match that of the Avalanche Manager.

Problem:

One of the status codes in Table A.1 appears on the RF terminal.

Possible Cause:

- Refer to Table A.1 for status code meanings.
- Status code 0200 during download indicates poor communications between the Avalanche Manager and the cradle. This may be due to the integrity or length of the cable.

Status Code	Meaning
0000	Download was successful
0002	Receive overrun error
0004	Receive parity error
0008	Receive framing error
0010	Programming voltage not present
0020	DSR or CD not detected on open
0080	ABORT key hit during comm
0100	CD lost during session
0200	Illegal Intel hexadecimal record
0400	Unsupported Intel record
0600	NVM EEPROM failed to erase
0800	Receive time-out error
1000	Control start character time-out
2000	Clear To Send inactive time-out error
4000	Receive buffer full

Table A.1 Download HEX file Communication Status Codes

Problem:

Communications port dialog box on the Avalanche Manager displays a status of "Download Aborted - Lost DSR" and the terminal shows a status of 0040 after a download has begun.

Possible Cause:

- The terminal was pulled out of the cradle during the middle of the file transfer.
- The cradle lost power during the file transfer.

Problems Synchronizing with the Console

Problem:

Terminal does not attach to the console using RF.

Possible Cause:

- Network setup is configured incorrectly on the Avalanche Manager.
 - Terminal network setup is incorrect.
 - Either the Avalanche Manager's or Terminal's IP Address is already used.
 - The Avalanche Manager configuration within the terminal is wrong.
-

Solution!

- Refer to *When Using RF* section under *Terminal does not Attach to the Console on page C-130* to determine what the problem is.

Problem:

Terminal does not attach to the console using a serial connection.

Possible Cause:

- A full null modem cable is not being used.
- Cable is defective.

Solution!

- Refer to *When Using Serial* section under *Terminal does not Attach to the Console on page C-130* to determine what the problem is.

Problem:

Terminal attaches but the console doesn't try to download anything.

Possible Cause:

- The software package is not enabled.
- The Software Collection is not enabled.
- The software package may have already been downloaded to the terminal.
- Target selection configuration for the software collection or software package may exclude the terminal from receiving the software package.

Solution!

- Refer to *Terminal Attaches but the Console doesn't try to Download Anything on page C-132* for details.

Problem:

Terminal attaches and a download begins but fails when using serial or RF connection.

Possible Cause:

- Poor network conditions exist.
- Cradle or null modem may not meet the necessary specifications.

Solution!

- See *Terminal Attaches and a Download Begins but Fails on page C-132* for details.

Problem:

Terminal will not receive a software package that the console is trying to send.

Possible Cause:

- Terminal flash disk is full.

Solution!

- See *RF Terminal Flash Drive is Full on page C-132* to resolve this issue.

Enabler Configuration Problems

Problem:

I can not ping the terminal. The RF terminal is not communicating at all.

Possible Cause:

- There is a mismatch between firmware and the RF Driver.
- TCP/IP Stack is configured improperly.
- TCP/IP Address assignment method (i.e., IP Pooling, BOOTP, DHCP) is not set up correctly.
- The Network ID (i.e., ESS_ID) does not match that of the RF network.
- APs in the vicinity may not have antennas connected.
- The terminal MAC Address may not be included in an enabled AP Access Control List.

Solution!

- See *(I can not Ping the Terminal) on page C-121* to assist with the solution.
- See *Terminal IP Address Assignment Problem on page C-126* to assist with the answer.

Problem:

I can ping the terminal but the RF terminal is not communicating.

Possible Cause:

- No host profile is configured for the Telnet Client software application selected.
 - The IP Address is also used by another node on the network.
-

Solution!

- See *(I can Ping the Terminal) on page C-125* to assist with the solution.

Host Communications

Problem:

RF Terminal can not connect to the host.

Possible Cause:

- No Telnet software packages are found on the RF terminal.
- A host profile is not configured for the Telnet software package in use.
- An error message has occurred after an attempt to connect to the host was made.

Solution!

- Refer to *RF Terminal can not Connect to the Host on page C-128* for resolution assistance.

RF Terminal is not Communicating at all (I can not Ping the Terminal)

SLAODI (i.e., Radio Driver) is not Loading

- This is most likely due to a firmware mismatch. Refer to *RF Firmware and Driver Packages (1 or 2 Mb)* on page B-65. Figure A.2 shows an example of a unsuccessful radio driver load when the RF terminal boots. Watch an RF terminal carefully after a boot is performed to view the data indicating an unsuccessful radio driver load. Furthermore, when accessing the Radio Configuration function in this state, the Terminal Info item within the Radio Parameters sub-menu displays a screen similar to that shown in Figure A.3.

```
SLAODI - DOS- 6: The ad
  apter did not initia
  lize. SLAODI did no
  t load.
```

```
Strike a key when re
  ady . . .
```

Figure A.2 Unsuccessful Radio Driver Load

```
S24CFG V5. 27
```

```
Radi o Dri ver
  Not Loaded
```

```
Press a key. . .
```

Figure A.3 Terminal Info Also Displays Unsuccessful Radio Driver

SLAODI (i.e., Radio Driver) Driver Loads (The RF Terminal still doesn't Communicate with the Network)

- The SLAODI (i.e., radio driver) driver loaded, but the terminal can not be pinged. Perform the steps described here to determine whether the problem is an RF problem or a TCP/IP configuration issue.
 - Telnet to the AP from a TCP/IP network node that has a VT100 Telnet Client.
 - After logging into the AP, select Show Mobile Units from the MAIN MENU. If the MAC Address does not reside in the Mobile Units table, proceed to *(I can not Perform a MAC Level Ping to the RF Terminal)* on page C-123. If the MAC Address does appear in the Mobile Units table, highlight the MAC address in the Mobile Units table and select the AP ping option to perform a MAC Address ping to the RF terminal. Once the ping is started a screen similar to the one in Figure A.4 appears.

3. Follow the instructions on the screen to perform the ping. Note the number of pings transmitted and received. If no pings are received from the RF terminal, proceed to *(I can not Perform a MAC Level Ping to the RF Terminal)* on page C-123.
4. If the MAC level ping is successful, confirm the IP Address, the Subnet Mask, and IP Router Address with the Network Administrator.

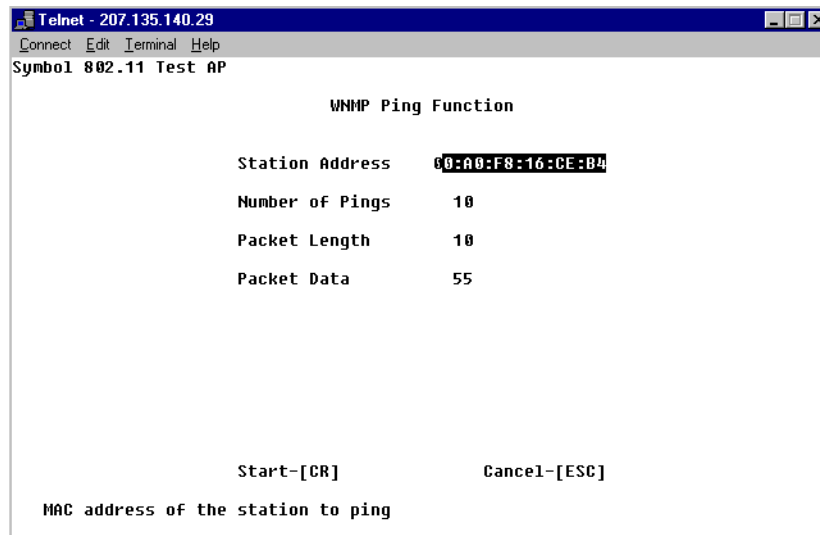


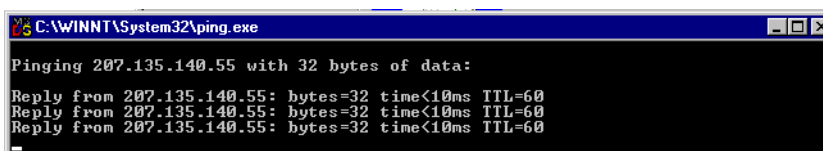
Figure A.4 AP Ping Function Screen

TCP/IP Stack Fails to Load

Review the following items in the order presented when this condition occurs.

- No Terminal IP Address is specified in the Radio Configuration function.
- BOOTP/DHCP setting does not acquire the IP Address. Refer to *Terminal IP Address Assignment Problem* on page C-126.
- The IP Address assigned to the RF terminal is already assigned to another RF terminal. Perform the following steps to confirm.
 1. Power the RF terminal off.
 2. Ping the RF terminal from another TCP/IP node on the network. The example shown in Figure A.5 demonstrates a ping performed from the Run dialog box on a PC using Windows NT 4.0.

3. If a response is achieved, this signifies another network node is using this IP Address. Contact the Network Administrator to attain a new IP assignment for the RF terminal.



```

C:\WINNT\System32\ping.exe
Pinging 207.135.140.55 with 32 bytes of data:
Reply from 207.135.140.55: bytes=32 time<10ms TTL=60
Reply from 207.135.140.55: bytes=32 time<10ms TTL=60
Reply from 207.135.140.55: bytes=32 time<10ms TTL=60

```

Figure A.5 Successful Ping from Windows NT 4.0 Machine

SLAODI (i.e., Radio Driver) Driver Loads (I can not Perform a MAC Level Ping to the RF Terminal)

Check the following items in the order described:

- The RF driver and firmware could be mismatched. For example, the RF terminal could be using 802.11 firmware and the radio drivers could be Pre-802.11. Perform the steps displayed here to determine whether the RF terminal is using 802.11 or Pre-802.11 (i.e., Spring) firmware.
 1. Access the *AVALANCHE CLIENT CONFIGURATION* (i.e., *CONFIG MENU*), FUNC, CTRL, R. Enter password, *system*. Type 'Y' to confirm terminating an active session.
 2. From the CONFIG MENU, choose Radio Parameters.
 3. At the RADIO MENU, select Terminal Info.
 4. Verify the Firmware Version displayed on this screen. A version beginning with 3 indicates the RF terminal is utilizing Pre-802.11 (i.e., Spring protocol) whereas a firmware version beginning with a 4 specifies 802.11 protocol usage. See Figure A.6.

S24CFG V5. 27 Spr

MAC Address:

00- A0- F8- 10- 2E- 6B

Firmware Version:

V3. 21 970819

Diagnos tics eXit

Figure A.6 RF Terminal Info Screen

5. Press the X key to exit this screen..
- There may be a mismatch between the Access Points and the mobile devices. In this case, the AP may employ 802.11 radio protocol and the RF terminal may employ the Pre-802.11 protocol or vice versa. Do the following to verify the type of AP:
 1. Telnet to the AP from a TCP/IP network node that has a VT100 Telnet Client.
 2. Type the password, *Symbol*, at the prompt to log into the AP. Press ESC to bring up the MAIN MENU of the AP.

3. Select Show System Summary from the MAIN MENU. Note the AP Firmware Ver. A version beginning with 3 indicates the Access Point is utilizing Pre-802.11 (i.e., Spring protocol) whereas an AP Firmware Ver. beginning with a 4 specifies an AP using the 802.11 protocol. See Figure A.7.
4. Press CTRL + D to terminate the Telnet Session.

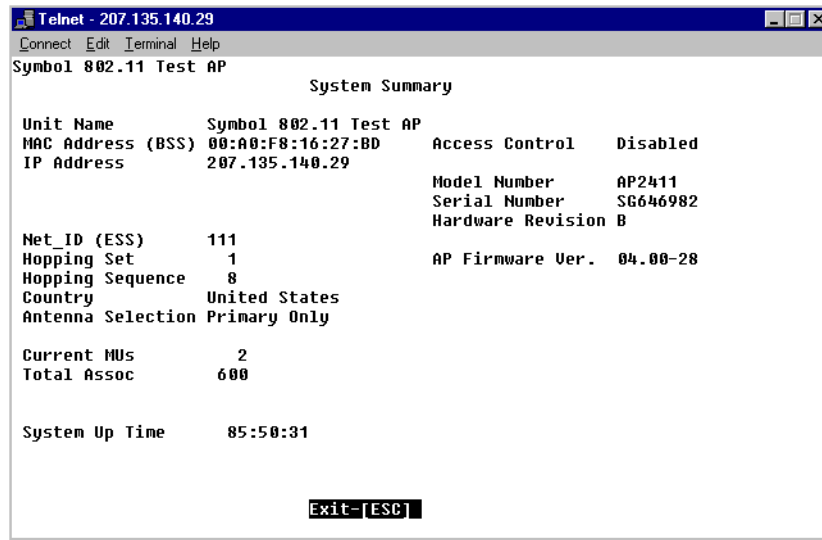


Figure A.7 System Summary of 802.11 Access Point

- The Access Points may not have an antenna attached or an incorrect antenna may be installed.
- The Network ID (i.e., ESS_ID) may be configured incorrectly.
 - a. Check the Network ID on the RF Terminal.
 1. Access the *AVALANCHE CLIENT CONFIGURATION* (i.e., *CONFIG MENU*), FUNC, CTRL, R. Enter password, *system*. Type 'Y' to confirm terminating an active session.
 2. From the CONFIG MENU, choose Radio Parameters.
 3. At the RADIO MENU, select Radio Parameters.
 4. Note the active RF Network ID. This must match the Network ID being used in the Access Point.

Note: Within the CONFIG MENU, Function 1 provides help to maneuver on appropriate screens

- b. Check the Network ID within the Access Point.
 1. Telnet to the AP from a TCP/IP network node that has a VT100 Telnet Client.
 2. Type the password, *Symbol*, at the prompt to log into the AP. Press ESC to bring up the MAIN MENU of the AP.
 3. Select Show System Summary from the MAIN MENU. Note the AP Net_ID. It should match the Network ID configured in the RF terminal. See Figure A.7.

4. Press CTRL + D to terminate the Telnet Session.
- Verify if the Access Control List Feature is being used in the Access Point. If it is, confirm that the MAC Address of the RF terminal is in the Allowed Mobile Units list. Use these steps to confirm:
 1. Telnet to the AP from a TCP/IP network node that has a VT100 Telnet Client.
 2. Type the password, *Symbol*, at the prompt to log into the AP. Press ESC to bring up the MAIN MENU of the AP.
 3. Select Show System Summary from the MAIN MENU. Note whether Access Control is enabled or not. Now, choose Select Access Control List to view the Allowed Mobile Units for the AP. If the RF terminal being used is not in the list it will not be able to communicate with the network. See Figure A.8.
 4. Press CTRL + D to terminate the Telnet Session.

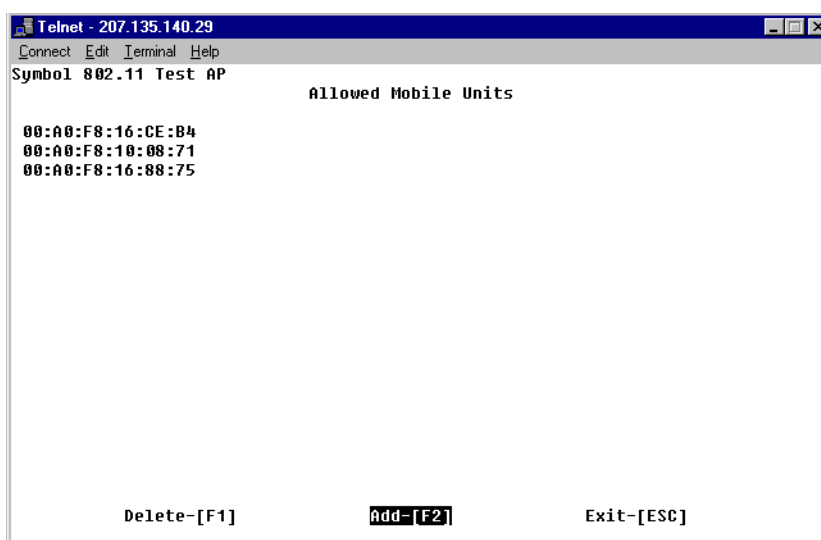


Figure A.8 AP Access Control List

RF Terminal is not Communicating (I can Ping the Terminal)

Check the following items in the order mentioned.

- No host profile is configured for the Telnet Client software package. Please see *RF Terminal can not Connect to the Host on page 128*.
- The IP Address of the RF terminal is assigned to another RF terminal. Use these steps to determine if this is the problem.
 - a. If the RF terminal boots, do the following:
 1. Power off the RF terminal.

2. Ping the RF terminal. See Figure A.5 for sample ping.
 3. If the terminal can be pinged while the RF terminal is in the off position, another terminal or network node shares this IP Address. Contact your Network Administrator to get this problem fixed.
- b. If the RF terminal does not boot, perform the step outlined here.
1. If the RF terminal displays a message similar to that seen in Figure A.9 at boot time, the terminal is sharing an IP Address with another node on the network. Contact your Network Administrator.

```
Novell TCP/IP Transport v4.12 (930928)
(C) Copyright 1992 Novell, Inc. All Rights Reserved.
```

```
FATAL: IP address assigned is already in use by: 0020af27270d
```

```
Strike a key when ready . . .
```

Figure A.9 Duplicate IP Address Message

Terminal IP Address Assignment Problem

IP Address not Allocated using Manager IP Pools

Check to see if an IP Address Pool exists on the Avalanche Manager. A plus sign in front of the IP Address Pools icon indicates the presence of at least one IP Pool. See Figure A.10.



Figure A.10 IP Address Pools with Plus Sign

- Confirm the following three items:
 - The IP Pool is activated.
 - Only one IP Pool Address is activated.
 - IP Addresses are available for RF terminal (i.e., MAC Address) assignment.

Use the procedures shown here to verify the above items.

1. Right-click on the IP Address Pools within the Avalanche Manager Tree View.
 2. Click on all defined IP Address Pools to determine which one displays a status of Active in the Summary View. If more than one IP Address Pool displays a status of Active, disable one of the IP Address Pools. If none of the IP Address Pools are Active, enable one of them.
 3. Select the active IP Address Pool and press the Manage IP Address Pool button within the Summary View. Note whether there are available IP Addresses that can be assigned to mobile devices. See *Software Collections on page 40* for more information.
- The RF terminal is not in a cradle. The Avalanche Manager must assign the IP Address via the serial connection when using this option.
 - The RF terminal does not attach to the Avalanche Manager. See *Terminal does not Attach to the Console on page C-130* and refer to the *When Using Serial* section.

IP Address is not Acquired via BOOTP

- Review the Radio Configuration setup within the RF terminal to ensure that BOOTP is selected in the Terminal IP Address field. Refer to the appropriate Avalanche emulation client user guide for details.
- Contact the Network Administrator to verify that either a BOOTP server or BOOTP Relay Agent reside on the local network segment when a message similar to the one shown in Figure A.11 appears. In addition, determine whether IP Addresses are available on the BOOTP server.

```
Requesting my IP address from a BOOTP server ...
```

```
Requesting my IP address from a RARP server ...
```

```
FATAL: Unable to determine this station's IP address.
```

```
Strike a key when ready . . .
```

Figure A.11 BOOTP Failure Message

IP Address is not Acquired via DHCP

- Make sure the AVA3 update kit has been downloaded to the RF terminal. Refer to the appropriate Avalanche emulation client user guide for details on performing this task.

- Review the Radio Configuration setup within the RF terminal to ensure that dhcp is selected in the Terminal IP Address field. Refer to the appropriate Avalanche emulation client user guide for details.
- Contact the Network Administrator to verify that a DHCP server resides on the local network segment when a message similar to the one shown in Figure A.12 appears. In addition, determine whether IP Addresses are available on the DHCP server.

```
FATAL: Unable to
determine this
station's IP
address
Strike a key when
ready
```

Figure A.12 IP Address not Assigned via DHCP

RF Terminal can not Connect to the Host

Review this section to determine what may be inhibiting the RF terminal from communicating to the host.

- When accessing the Host Profiles sub-menu from the Radio Configuration function menu, the screen shown in Figure A.13 is displayed.

```
No application
select an applica-
tion from the App.
Menu and return to
Host Config.
```

```
Press a key. . .
```

Figure A.13 No Application Selected Screen

This means no software applications have been selected. For example, the Avalanche Enabler has been loaded and configured, but there are no Telnet Client software packages residing on the terminal. Download a Telnet Client software package to the RF terminal and add a host profile to resolve this issue. Review the appropriate Avalanche emulation client user guide for more information.

- A message appears after an application is selected indicating that the RF terminal can not communicate with the host. This means there is no host profile configured with this application. See Figure A.14. To resolve this condition, do the following:
 1. Access the *AVALANCHE CLIENT CONFIGURATION* (i.e., *CONFIG MENU*), FUNC, CTRL, R. Enter password, *system*. Type 'Y' to confirm terminating an active session.
 2. At the *CONFIG MENU*, select Host Profiles and press ENTER.
 3. Press the ENTER key or use CTRL + A to add a new host profile.

4. Save the new host profile and exit the Radio Configuration function.

Note: Within the CONFIG MENU, Function 1 provides help to maneuver on appropriate screens

Remote IP Address
information not
configured!

Update the TCP
Configuration before
attempting to
connect again.

Figure A.14 No Host Profile Created Message.

- The RF terminal uses the following standard telnet messages to inform the user of their connection progress and any error conditions that may occur. This section is intended to help diagnose any problems associated with error messages that are displayed when the terminal is attempting to communicate with the host.
 - a. "No host connection"
 1. This is the standard "not connected" message. No errors are indicated.
 - b. "Connection to xxxx Refused"
 1. A connection to the host was made, but the host refused the connection--typically because it is out of resources, the telnet server software is down or it is not running on the port which was selected.
 - c. "Connection to xxxx has Timed Out"
 1. The host could not be located. Common reasons include:
 - The host is down.
 - The configured host address is incorrect.
 - The Enabler's Netmask and/or Router Address are incorrect.
 - The physical network is down.
 - The Spectrum 24 network is down (The Access Point is down or the Spectrum 24 Network ID is incorrectly configured).
 - Some hosts may cause a time out during connection if they are very busy, even though there are no configuration or hardware errors.
 - d. "Negotiated emulation (xxxx) is not supported"
 1. An emulation type has been negotiated with the host, but it is not a type that this client can support. Either the emulation type has been incorrectly configured, or the host does not support the type which was selected and has therefore negotiated down to another type.
 - e. "Connection to xxxx has been terminated", or "Connection closed by foreign host"

1. The host closed the session, either by the user's request or for its own reasons (inactivity timeout, host is going down etc.) This message may also occur if communications fail while the session is up; either in the physical or the Spectrum 24 network.
- f. "Invalid server address: xxxx", or "Invalid remote IP address"
There are two possibilities:
 1. If the host profile contains the "name" of the host, then this happened because the "name" could not be resolved into the IP address. Either the name is wrong, or the name server(s) are down. HINT: If there is a long delay before getting this message, then the name server is most likely down. If the message comes back within a few seconds, then the name is mostly likely wrong.
 2. If the host profile contains the IP address of the host, then the address string contained an invalid character.
- This section is intended to help diagnose any problems associated with RF terminal messages that are displayed when the session is establishing a connection.
 - a. "Looking up host xxxx"
 1. The client is checking DNS to resolve a host name.
 - b. "Trying to connect to xxxx"
 1. The client is currently attempting to connect to the host. This message will remain until a socket-level connection is made.
 - c. "Connected to xxxx"
 1. A socket-level connection has been made but the client is still waiting for the host to complete the telnet negotiations and send out the first screen. The screen may arrive quickly or if the host is slow it may take a moment. If the screen does not arrive at all, then the host is having problems internally.

Software Package Download Problems

Review these items in the order they are presented.

Terminal does not Attach to the Console

When Using RF

- Verify the network setup on the console. Make sure the adapter is functioning properly and the IP configuration is correct. Consult your Windows Operating System Manual for more information.
- Ping the RF terminal from the Avalanche Manager. If the ping is unsuccessful, proceed with the steps shown here.
 1. Ensure that the following terminal network parameters are configured properly. These are:
 - IP Address

-
- Subnet Mask
 - IP Router Address
 - Network ID (i.e., ESS ID)
 - 2. Check the network configuration of the Avalanche Manager.
 - When the ping from the Avalanche Manager to the RF terminal is successful, check for duplicate IP Addresses on the RF terminal and the Manager. Follow these steps:
 - a. If the RF terminal boots, do the following:
 - 1. Power off the RF terminal or Avalanche Manager depending on which IP Address is being verified.
 - 2. Ping the RF terminal or Avalanche Manager from another network node. See Figure A.5 for sample ping. If the RF terminal or Manager can be pinged while the RF terminal or Manager is in the off position, another terminal or network node shares this IP Address. Contact your Network Administrator to get this problem fixed.
 - b. If the RF terminal does not boot, perform the step outlined here.
 - 1. If the RF terminal displays a message similar to that seen in Figure A.9 at boot time, the terminal is sharing an IP Address with another node on the network. In this case, the TCP/IP stack did not load. Contact your Network Administrator.
 - Verify the Avalanche configuration. The Avalanche menu item within the *AVALANCHE CLIENT CONFIGURATION* contains the IP configuration for the Avalanche Manager. The IP Address of the Manager is not required if the Manager and the mobile devices reside in the same network segment because the RF terminal performs a broadcast to find the Manager in this instance. When the Manager resides in one segment and the RF terminal resides in another, the IP Address of the Manager must be entered in the Version Control configuration form and the appropriate Router IP Address is needed. Refer to an appropriate Avalanche emulation client user guide for more information.

When Using Serial

- The serial connection is usable when downloading a HEX file, however, the RF terminal can not communicate to the Avalanche Manager. In this case, the null modem cable being used is not a full null modem (i.e., null modem that meets the specifications the cradle or terminal demands). The null modem cable used must not block or loop back DSR since this is used by the Enabler to detect the presence of the Manager.
- The serial connection does not allow HEX file downloads. The cable may be bad or the incorrect type of cable for this type of communication. Refer to *Problems Downloading a HEX File on page C-115* for more information.

Terminal Attaches but the Console doesn't try to Download Anything

- Click on the software package and confirm that it is enabled. The upper right portion of the Summary View on the Avalanche Manager displays the status of the software package. For a software package to download to the RF terminal, the status must display Active. Refer to *Software Packages on page 32* for more information.
- Check to see if the software package was already downloaded to the RF terminal. To do this, use this procedure.
 1. Click on the RF terminal in the List View to highlight it.
 2. Click on the More Button in the Summary View.
 3. Review the Client Communications Details dialog box to see the status of software packages assigned to the RF terminal. Refer to *Software Packages on page 37* for more information.
- The target selection of the software collection or the software package may be set to exclude this terminal from the download of the software package. Click on the software collection and software package separately to view the current target selection. See *Software Packages on page 33* for information regarding target selection.

Terminal Attaches and a Download Begins but Fails

Fails using RF Connection

- Poor network conditions may be causing the symptom to occur. See your Network Administrator. To confirm this condition, isolate the RF terminal, an Access Point, and the Manager from the rest of the network and restart the RF download.

Fails using Serial Connection

- Some older cradles tend to have difficulty with downloads. Make sure the cradle and null modem cable meet the specifications the RF terminal demands. See *When Using Serial under Terminal does not Attach to the Console on page C-130* for more details.

RF Terminal Flash Drive is Full

- The Avalanche Enabler will display a message when the flash drive is full. See Figure A.15. Follow these steps to recover from this situation.

```
Looking up console.  
Contacting console.  
Updating software.  
Please wait. . . .  
UPDATE INCOMPLETE:  
Disk is full.  
Press a key. . .
```

Figure A.15 Flash Drive Full Message

– Use these steps for Series 3000 mobile devices:

1. Coldboot the terminal so that the App. Menu as seen in Figure A.16 will appear. When no application software packages are loaded on the RF terminal, Figure A.17 is displayed. Skip the next step if Figure A.18 is presented.

```

App. Menu
5250/3270 Tel net
VT/HP Tel net

```

Item 1 of 3
Figure A.16 App. Menu

```

No application
selected
Options
Configure IP

```

Item 1 of 1
Figure A.17 No Application Loaded

2. Press the ESC key (i.e., CLEAR on most mobile devices) from the screen shown in Figure A.16. The following figure is presented.

```

No application
selected
Options
Configure IP

```

Item 1 of 1
Figure A.18 No Application Selected

3. Use FUNC, CTRL, F to clear the flash drive. Type *flash* at the password prompt to confirm the operation.

– Use these steps for Series 4040 and 5040 mobile devices:

1. Boot the RF terminal.
2. Press ESC at the access menu to use other applications installed on the RF terminal. See Figure A.19.
3. When no application software packages are loaded on the RF terminal, Figure A.17 is displayed. Skip the next step if Figure A.17 is presented.
4. Press the ESC key from the screen shown in Figure A.17 and Figure A.18 is presented.
5. Use ALT, F to delete the apps directory and the temp directory on the 4040 and 5040 mobile devices.

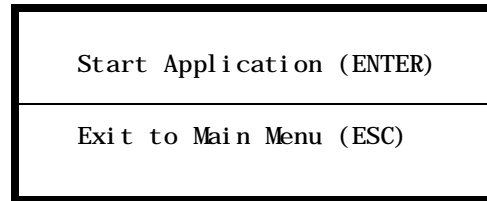


Figure A.19 **VRC 4040/5040 App Access Menu**

Contact Us

For questions or problems with Avalanche, contact WaveLink Corporation at support@roisys.com or call 801-255-1777. In addition, see our web site at: <http://www.roisys.com/contact/contact.htm>.

RF Firmware and Driver Updates

RF Firmware and Driver Packages (1 or 2 Mb)

RF Firmware packages are currently available for Series 3000, Series 4000 and Series 7000 mobile devices. These packages provide the means to update a mobile unit's radio firmware and driver to a current and known operational version. They may also be used to flash pre-802.11 protocol radios to 802.11 or vice-versa. The names of the firmware packages are:

- RF3_vXXX.exe for Series 3000 mobile devices
- RF4_vXXX.exe for Series 4000 mobile devices
- RF7_vXXX.exe for Series 7000 mobile devices.

Do the following to change the firmware within the Mobile Devices:

WARNING

If the firmware update procedures are not followed carefully, mobile unit may become inoperable. Mobile devices should not be powered off during the firmware upgrade.

1. Install the packages to the appropriate software collection and profile on the Avalanche Manager. Click on the firmware package icon and the Summary View indicates that it is an Auto-Run software package type. This means the package will run immediately after it is successfully downloaded on the mobile unit. For more information regarding *software packages*, see *Software Packages on page 32*.
 2. Right-click the package and select whether this will be a Pre-802.11 firmware update or an 802.11 firmware update.
 3. The target selection of the firmware update package is set to differentiate between the different series types. It does not, however, differentiate between 1/2 Mb and 11 Mb mobile unit types. These target selections can not be modified so as to assure that these packages will not download to the incorrect mobile devices. Modify the target selection of the software collection to further restrict which mobile devices will receive this firmware update package.
 4. Right-click the firmware package to enable it.
-

Note: Make sure that other mobile devices residing in the same software collection are not booted while updating mobile devices needing firmware upgrades.

5. If the mobile unit is currently operating at a given site, then the RF can be used to download the firmware upgrade package. The Access Points will require firmware updates for the mobile devices to communicate. If the mobile unit is not currently operating and doesn't match the firmware at the site, employ the cradle to download the firmware upgrade.
6. Perform a cold boot or warm boot on the mobile unit to receive the firmware package from the Avalanche Manager. Once the firmware update package is downloaded successfully to the mobile unit, it is executed automatically on the mobile unit.
7. After the firmware update has been performed, access the *AVALANCHE CLIENT CONFIGURATION* (i.e., *CONFIG MENU*).
8. Modify the Network ID to correspond to the appropriate AP network. In the 802.11 environment, the Network ID is also referred to as the ESS ID. The Network ID in the Pre-802.11 environment supports three characters whereas the ESS ID (i.e., Network ID) allows 32 characters in the 802.11 environment. Note that the Network ID field scrolls when the mobile unit is setup for 802.11 so that Network IDs greater than 3 characters may be entered.

RF Firmware and Driver Packages (11 Mb)

Some mobile devices use the 802.11B protocol. This protocol supports 11Mb transfer rates.

As hardware improves, new firmware is implemented into mobile devices causing, occasionally, incompatibilities between the firmware and radio drivers. As this occurs, WaveLink creates new packages to update the software to match the radio drivers with the firmware.

For example, the PDT7546 mobile unit contained radio driver 1.15-02 and firmware version 1.00-03. The radio driver 1.15-02 is compatible with the firmware version 1.00-03. However, when Symbol Technologies installed the newer firmware version 2.20-01 into the 11Mb 7540 series mobile devices, an incompatibility issue was created. WaveLink Corporation created the *RF7-11_v20 software package* which upgrades the radio driver to version 2.23-00 which is compatible with the newer firmware.

To assess which firmware and radio driver is loaded on the mobile unit, access the *AVALANCHE CLIENT CONFIGURATION* (i.e., *CONFIG MENU*), FUNC, CTRL, R. Enter password, *system*. Type 'Y' to confirm terminating an active session. Select Radio Parameters. Select Terminal Info.

Note: If, after implementing the new firmware, the mobile unit is flash formatted, this package may need to be reapplied to assure that compatible radio drivers and firmware are loaded.

Steps for loading the RF update packages for the 11 Mb mobile device are as follows.

WARNING

If the firmware update procedures are not followed carefully, mobile unit may become inoperable. Mobile devices should not be powered off during the firmware upgrade.

1. Install the packages to the appropriate software collection and profile on the Avalanche Manager. Click on the firmware package icon and the Summary View indicates that it is an Auto-Run software package type. This means the package will run immediately after it is successfully downloaded on the mobile unit. For more information regarding *software packages*, see *Software Packages* on page 32.
2. The target selection of the firmware update package is set to differentiate between the different series types. It does not, however, differentiate between 1/2 Mb and 11 Mb mobile unit types. These target selections can not be modified so as to assure that these packages will not download to the incorrect mobile devices. Modify the target selection of the software collection to further restrict which mobile devices will receive this firmware update package.
3. Right-click the firmware package to enable it.

Note: Make sure that other mobile devices residing in the same software collection are not booted while updating mobile devices needing firmware upgrades.

4. If the mobile unit is currently operating at a given site, then the RF can be used to download the firmware upgrade package. The Access Points will require firmware updates for the mobile devices to communicate. If the mobile unit is not currently operating and doesn't match the firmware at the site, employ the cradle to download the firmware upgrade.
5. Perform a cold boot or warm boot on the mobile unit to receive the firmware package from the Avalanche Manager. Once the firmware update package is downloaded successfully to the mobile unit, it is executed automatically on the mobile unit.

Contact WaveLink-Utah at 801-255-1777 regarding the latest information on which packages are available. Currently, the following packages are available.

- RF3-11_vXX.exe for 3000 Series mobile devices
- RF7-11_vXX.exe for 7000 Series mobile devices

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