

ZETRON

Model 2540 FASTNet Switch
Operation and Programming Manual

Part No. 025-9270G

Please check for change information at the front of this manual.

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WARRANTY STATEMENT

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1. FASTNET OVERVIEW

INTRODUCTION

The Model 2540 FASTNet Switch is a digital switch, much like a PBX, used for networking multiple LTR™ sites into one wide-area LTR™ network. FASTNet's database files reside on hard disk in the switch. A PC-based database manager, Fastbase, is used for updating, changing, and retrieving the database to/from the FASTNet Switch.

USING THIS MANUAL

Understanding what the manual is saying helps you install, program, and troubleshoot your system faster and easier. This section orients you on the way things are presented, so that we can "speak the same language". Descriptions follow of the way things are identified throughout the manual and where to find what you're looking for quickly and easily.

Organization of Sections

The manual is split into several sections so that you can find the exact information you need and any related topics. The sections are organized as follows:

Section 2 - Installation and Communications

This section describes how to install Fastbase and the Trunk Card Editor on the office computer and connect to the Model 2540 FASTNet Switch.

Section 3 - Fastbase Overview

This section provides an introduction to the database program. It discusses the basics of how the program is organized and used.

Section 4 - Setting Up a Database

This section describes how to program a new FASTNet node, step-by-step. Every selection from the editNET menu is explained in detail: Node Configuration, Outdial Program, Least Cost Routing Tables, Dialing Plans, Radio Sites, Roaming Class of Service (COS), Toll COS, General COS, and Node Users. In addition, Section 4 describes how to transfer updated database information to the Model 2540.

Section 5 - Updating Multibase, Ebase, or TCBase

This section describes the necessary changes to the Model 49 or Model 459 database when a FASTNet Switch is connected to an already existing LTR™ system.

Section 6 - Billing and Statistics

This section describes how to retrieve, interpret, and print SMDR and user files.

Section 1. FASTNet Overview

Section 7 - Trunk Card Editor

This section describes the database program used to configure the Model 2540 system and trunk card parameters.

Section 8 - Netlink

This section describes the serial data communications program used by the FASTNet Switch.

Section 9 - Voice Prompts

This section describes how to access, program, and use the FASTNet system voice prompts.

Section 10 - System Configuration Files

This section describes the files that determine how the FASTNet Switch operates. This section covers the four custom files and how to modify and interpret them.

Section 11 - Example Databases

This section provides some examples of how to setup nodes, sites, and users in Fastbase for different applications.

Section 12 - Glossary

This section defines many of the industry-specific technical terms used in this manual.

Text Notational Conventions

Notational conventions are the manual text styles that identify specific types of words. For instance, it is important that you know which words refer to filenames, operator commands, screen quotes, manual titles, etc. The notational conventions will help you understand what is being said. Table 1-1 summarizes the text styles used in this manual.

Table 1-1. Summary of Manual Text Notational Styles

Sample Notation	What it Means
<xxxx>	The text inside the < > identifies a keyboard entry. Do not include the < > in your entry. Ex. <Tab> means press the "Tab" key
Xxxx	The text that is Initial Capitalized within a sentence refers to a menu field or name. Ex. Choose Config data from the Restore menu.
XXXX	The text in SMALL CAPITAL LETTERS is a system configuration filename.
xxxx	The text in courier font is a screen view in Fastbase or TCE.
'xxxx'	The text in the 'single quotes' is exactly what appears on the computer screen.

Related Manuals

Three manuals describe the Model 2540. In addition, since the FASTNet Switch is usually interfaced with a Model 49 or Model 459 trunking system, the manuals for the repeater manager are good references.

Each of the manuals listed in Table 1-2 is designed to be used in conjunction with one or more of the other manuals. Depending on the system application, you may have up to five different manuals. Note that there are two different versions of the Model 49 (that are compatible with FASTNet) and five different database managers (TCE is included in this manual). Each manual can stand alone, but cannot cover all of the information necessary to install, configure and maintain an efficient system.

Zetron recommends storing the manuals in a convenient location. For instance, the operation and installation manuals should be located with the equipment, and the database manuals should be kept with the office computer. In addition, when contacting Zetron Applications Engineers it is helpful if the appropriate manual(s) are handy for reference.

Section 1. FASTNet Overview

Table 1-2. Model 2540 and Related Manuals

Manual Title	Zetron Part Number	Description
<i>Model 2540 FASTNet Switch Operation & Programming</i>	025-9270	Presents an overview of the features of the Model 2540 and explains how to program the Model 2540 using Fastbase, the PC-based database manager for the Model 2540. Information regarding the Trunk Card Editor is also provided in order to properly configure the input and output trunk ports of the Model 2540.
<i>Model 2540 FASTNet Switch Installation & Maintenance</i>	025-9260	Presents step-by-step installation instructions with adjustment and troubleshooting procedures. Also included are the product specifications and theory of operation.
<i>Model 2540 FASTNet Switch Schematics</i>	025-9266	Presents the parts lists, schematic drawings, and silkscreens for the Model 2540.
<i>Model 49 Revision S+ Operation & Installation</i>	025-9313	Presents an overview of the Model 49 Trunking Repeater Manager hardware and theory of operation. Describes procedures for installing, adjusting, and maintaining the unit. (Newer main boards revisions S+)
<i>Model 49 Multibase Version 6.1+ Operation</i>	025-9297	Presents installation, setup, and management of the user database program, Multibase. Also describes billing file storage and management and some standard and optional features of the Model 49. (Newer software versions 6.x)
<i>Model 49 Ebase Operation</i>	025-9402	Presents installation, setup, and management of the user database program, Ebase, for the ESAS™ protocol. Also describes billing file storage and management and some standard and optional features of the Model 49.
<i>Models 459 & 452 Trunking Controllers Installation & Operation</i>	025-9450	Presents an overview of the Model 452 and 459 Trunking Controller hardware and theory of operation. Describes procedures for installing, adjusting, and maintaining the unit.
<i>Models 459 & 452 TCBase Operation</i>	025-9451	Presents installation, setup, and management of the user database program, TCBase. Also describes billing file storage and management of some standard and optional features.

The purpose of this particular manual is to explain the operation and programming of the FASTNet Switch using Fastbase.

SPECIAL FEATURES

The following subsections describe the basic software modules and features of the Model 2540 FASTNet Switch.

Call Router

The basic FASTNet Switch provides comprehensive call routing for LTR™ and other interconnected systems. Fastbase allows flexible call routing to be programmed into the FASTNet Switch for both incoming calls and mobile originated outgoing calls. All incoming calls are processed and routed to a preselected destination. Each dual trunk card has its own microprocessor that controls the audio path and the analog to digital functions.

Incoming DID calls can be routed to any repeater with interconnect capability. The DID calls can be routed to a directly connected site, or a remote site via microwave, UHF, or telco backbone. Incoming calls, where the user is identified by over dialing the user's mobile ID, can be routed the same as DID calls.

FASTNet is capable of routing 2- or 4-wire telephone lines and translating rotary pulses, DTMF, or MF signaling. Mobile users have the capability of forwarding their calls to a number of devices, such as a phone number, another mobile, or to optional voice messaging. Caller-directed call routing lets callers redirect their calls based on prompts in the announcement ("Press 1 for ..."). Any user can select forwarding options using a DTMF microphone or a standard telephone call into the FASTNet Switch. A user passcode provides security. Fastbase allows unique routing methods to be established for each user or group of users.

Least Cost Routing

Through Fastbase the FASTNet Switch is programmed to route outgoing calls in much the same way a PBX does. When a mobile user makes an interconnect call, the FASTNet Switch examines the dialed digits and routes the call to the least expensive available outgoing trunk. This allows the FASTNet Switch operator to take advantage of routing local calls to local trunks and long distance calls to a more cost-effective trunk group or a special carrier service.

The ability to route each call to the most inexpensive trunk group and carrier service is a great tool for enhancing revenue. Mobile-to-mobile phone calls can now be routed within the FASTNet Switch totally bypassing the telephone company. This provides two distinct advantages: one for the mobile users and the other for the FASTNet Switch operator. The mobile users experience improved audio quality because the audio path is routed from one repeater to the next repeater, eliminating the telephone company and all hybrids from the audio path. The advantage for the FASTNet Switch operator is the reduced telephone bill because the telephone company is eliminated from the call.

Section 1. FASTNet Overview

Toll Restriction

The FASTNet Switch can also perform toll restriction on the digits dialed by the mobile user, either on an individual basis for Model 49/459 LTR™ users or on a group basis.

Call Saver Voice Messaging

With the Call Saver Voice Messaging option installed, the FASTNet Switch becomes a voice messaging center. This allows unanswered calls and forwarded calls to be routed to an internal voice message box. The Call Saver Voice Messaging option can be added to FASTNet at any time and comes standard with voice prompts and 2 hours of message storage. Message storage time can be increased up to 48 hours of message storage.

Individual user courtesy prompts are a standard feature with Call Saver Voice Messaging. The end user can call into FASTNet and access the voice menu using a mobile or telephone. Then the user can record a message in his/her own voice, telling callers what actions are necessary to leave a message. The FASTNet Switch operator determines how long the courtesy prompts are and which users are assigned a message box. Call Saver Voice Messaging is sold to individual users which are identified by a class-of-service assignment.

The Call Saver Voice Messaging option also has a message reminder beep for LTR™ systems equipped with Zetron Model 49/459(s). It sends an audible prompt to the LTR radio whenever a message is stored for that user. The Model 49/459 signals the mobile with the message beep tone at keyup until the user recovers the message. If a mobile is busy and receives another call, the second caller can leave a message. After the mobile is disconnected from the call, it receives message beeps to inform the user that a message is waiting. In this way the mobile now acts like a pager. Call Saver Voice Messaging can also call a pager and leave a message.

Call Saver Voice Messaging can be used as an independent telephone voice message system. Users can call in from any telephone and retrieve their messages or leave a message for their callers.

Call Networker

The Call Networker option provides networking features for systems with more than one Model 49/459 site.

Follow-Me Roaming

Interconnect users with this feature enabled can roam into the area of another networked site, register on the new site, and have all phone-to-mobile calls automatically forwarded to the new site. To register on a new site, the user simply keys-up the mobile with the proper ID. The Model 49/459 notes that a new roamer has entered the area. The Model 49/459 site notifies the FASTNet Switch, and all subsequent calls are forwarded. Phone-to-mobile calls are forwarded to this site until the mobile registers on a different site. The FASTNet Switch

can also be set to automatically reset this mobile to its home site at a programmable time of day.

If a Follow-Me Roaming user has a message waiting in his/her message box and message beeps are enabled, the message waiting beeps are forwarded to the new site, the same way an interconnect call is forwarded.

Network Dispatch

Also called Wide-Area or Multiple-Site Dispatch, Network Dispatch allows multiple-site group calls with directly connected and dial-up sites. A Network Dispatch call may be useful for commercial applications, where a supervisor needs to make an announcement to several employees at one time. This function is only available for Model 49 sites. It is not supported by the Model 459.

To create a Network Dispatch call, first a FASTNet ID must be programmed to be a Network Dispatch number. When a FASTNet ID is designated as Network Dispatch, the sites (and the ID on the site) to be included in the Network Dispatch call must be defined. When a phone calls this Network Dispatch number, the FASTNet Switch tries to establish an audio path to every site included in the call and send the proper ID information to call the correct ID for each site. Only half-duplex radios can be used for Network Dispatch calls.

A Network Dispatch call can be initiated either by dialing the FASTNet Network Dispatch phone number or by keying up on a Network Dispatch ID on one of the network sites. All mobiles in a Network Dispatch call, except the originator, hear two short ringing tones and then audio is cut through. The originator, phone or mobile, hears "All sites connected." At this point, any mobile included in the call can key-up and talk. The first to key-up gains control. When a mobile unkeys, the rest of the mobiles hear a short beep and then they can key-up. If the call was originated by a phone, the phone audio is broadcast when none of the mobiles are keyed. To end the call, the originating party or any other mobile in the group pounds off or hangs up.

TeamTalk Dispatch

TeamTalk provides multiple-site dispatch for Model 49/459 sites directly connected to a FASTNet Switch. The direct connection can be via microwave, leased line, frame relay, etc. TeamTalk dispatch provides faster call setup and turnaround than the Network Dispatch function. Programming a telco number for TeamTalk allows anyone (for example, an interconnected mobile that is not part of a TeamTalk group or a group member who has driven outside the coverage area) to call the telco number to start and participate in a TeamTalk Dispatch call.

To create a TeamTalk Dispatch call, a FASTNet ID (and optionally a telco phone number) must be programmed to use the TEAMTALK script. The sites to be included in the TeamTalk Dispatch call must be defined. Each site to be included must also be programmed with a half-duplex interconnect LTR ID in Multibase/TCBase. When a TeamTalk Dispatch

Section 1. FASTNet Overview

number is called, the FASTNet Switch tries to establish an audio path to every site included in the call and send the proper ID for each site.

While a TeamTalk call is processed by the Model 49/459 site, the FASTNet Switch trunk LEDs appear to indicate that there are many failed new call attempts. Using the FASTNet liu command confirms that there is dispatch activity at the Model 49/459 sites and that there is not a failure somewhere in the system. The liu command displays "Ch_Busy" by each trunk that is connected to a site that is currently busy with the dispatch call.

A user initiates a TeamTalk Dispatch call either by keying up on the TeamTalk Dispatch ID or by dialing the FASTNet TeamTalk Dispatch phone number.

If the call is initiated by keying up, first the originating radio PTT is pushed. After the LTR handshake, the originator unkeys the radio and hears DTMF B9 tones that confirm that FASTNet is setting up the call. After all available sites are on the air, the originator hears a short go-ahead beep. The originator keys up and speaks, and this audio is heard by the other mobiles in the group at all the sites. When the originator finishes speaking, he or she unkeys. At this point, any mobile included in the call can key up and talk. The first to key-up gains control. When a mobile unkeys, the rest of the mobiles (optionally) hear a short beep and then they can key up. Any mobile in a TeamTalk Dispatch call can end the dispatch call by pounding off. The call also ends after a programmable period of no mobile keying up.

If the call is initiated by a telco phone line, the phone audio is broadcast when none of the mobiles are keyed.

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2. INSTALLATION AND COMMUNICATIONS

COMPUTER SYSTEM REQUIREMENTS

The Fastbase database management system for the Model 2540 FASTNet Switch operates on an IBM-compatible computer. The following minimum computer configuration is required to operate Fastbase:

- PC-XT, AT, 286, 386 compatible or faster
- 640 KB of RAM
- 10 MB of hard disk space
- 5¼-inch or 3½-inch floppy drive
- Monochrome or color display
- 9600 bps Hayes-compatible modem (internal or external)
- Printer attached to the parallel port
- MS-DOS Version 3 or above (Fastbase runs in a DOS window under Windows 95 or 98)



Note:

If you are using Zetron's ZEBRA Billing Software, at least a 286 computer with 40 MB of hard disk and 1 MB of RAM are recommended.

SOFTWARE INSTALLATION PROCEDURES

The following subsections describe installation of the two software programs included with the Model 2540 FASTNet Switch. Each program should be installed on an office computer connected to the Switch.

Fastbase Installation

To install Fastbase on the office computer, follow the steps below:

- 1) If this is an upgrade from Netbase, retrieve current Model 49 airtime totals, Model 49 call detail records, and Model 49 repeater loading data (if the information is important to you) using the cOmm49 menu in Netbase on the office computer. Backup the data to floppy diskettes with the Backup menu item.
- 2) Insert the Fastbase installation diskette into the appropriate floppy drive. (Drive A: in the examples below.)

Section 2. Installation and Communications

- 3) Switch to drive A (if blinking DOS prompt is not already "A:\>") by typing:

A:

- 4) At the DOS "A:" prompt, type:

INSTALL <Enter>

The installation program main menu shown in Figure 2-1 appears.

Fastbase Installation Program V1.0		Copyright 1996 Zetron Inc.
Install Progress		
<div></div>		
<div>Help</div> <div>This program will install Fastbase onto your computer. Enter the type of installation: (N)ew Installation (U)pgrade of Fastbase, OR conversion from Netbase</div>	<div>User Entry</div> <div>Enter 'N' or 'U':</div>	

Figure 2-1. Fastbase Installation Program

- 5) Follow the on-screen instructions.
- ☐ Enter an 'N' or 'U' for the installation type, depending on the current system.
 - Choose U (pgrade) if this is an upgrade from an earlier version of Fastbase or from Netbase.
 - Choose N (ew) if this is a first-time installation of a FASTNet Switch database program.
 - ☐ When prompted, enter the directory where the current files reside (upgrades only). The program looks to see if it can find the existing database files.
 - ☐ When prompted, enter the directory the new database files should be installed into (new installations only).
- 6) Once the files are installed and proper conversion has been confirmed, some old files can be deleted.
- The files with the extensions *.BEF and *.BAK are backups of the old database.

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- The files with the extension *.AUD are the audit files created during the database conversion.

- 7) Once the installation procedure is complete, make sure the program runs. At the DOS prompt, type:

FASTBASE <Enter>

Trunk Card Editor (TCE) Installation

The TCE program is included with Fastbase for configuring the Model 2540 trunk card parameters. See Section 7 for a more detailed description of the program. To install TCE on the office computer, follow the steps below:

- 1) Insert the Trunk Card Editor installation diskette into the appropriate floppy drive. (Drive A: in the examples below).
- 2) Switch to drive A: (if the blinking DOS prompt is not already "A:\>") by typing:

A:

- 3) At the DOS "A:" prompt, type:

INSTALL <Enter>

The installation program main menu shown in Figure 2-2 appears.

Installation Program V1.3 for TCE		Copyright 1993-96 Zetron Inc.
Install Progress		
<div></div>		
Help	User Entry	
Enter drive and directory for TCE files. If the directory doesn't exist, it will be created and the new files copied into it, otherwise the old files will be converted into the new format.	You MUST enter the drive letter and full directory path i.e. C:\TCE Enter TCE directory: C:\TCE	

Figure 2-2. Trunk Card Editor Installation Program

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- 4) Enter the drive letter and complete directory path where the TCE program should be installed.
 - The install program provides the default and recommended directory name:

\TCE

Changing Screen Colors

The standard Fastbase color scheme is white lettering on a blue background. If you wish to alter the screen settings, many different color combinations are available. The file 'color.zbs' stores color data for Fastbase. The file can be modified using any DOS editor. For example, using the standard editor in MS-DOS:

- 1) From the DOS prompt, type:

EDIT COLOR.ZBS

The file editing screen appears.

The file describes how to change screen colors. There are four different color settings; high, normal, reverse, and underline. You may need to experiment with different combinations to determine which is most effective.

- 2) Use the color chart (Table 2-1) to choose the appropriate code number for each background/foreground color combination.

Section 2. Installation and Communications

Table 2-1. Fastbase Screen Colors Chart

Foreground Color	Background Color							
	Black	Blue	Green	Cyan	Red	Magenta	Brown	Grey
Black	000	016	032	048	064	080	096	112
Blue	001	017	033	049	065	081	097	113
Green	002	018	034	050	066	082	098	114
Cyan	003	019	035	051	067	083	099	115
Red	004	020	036	052	068	084	100	116
Magenta	005	021	037	053	069	085	101	117
Brown	006	022	038	054	070	086	102	118
Light Grey	007	023	039	055	071	087	103	119
Dark Grey	008	024	040	056	072	088	104	120
Light Blue	009	025	041	057	073	089	105	121
Light Green	010	026	042	058	074	090	106	122
Light Cyan	011	027	043	059	075	091	107	123
Light Red	012	028	044	060	076	092	108	124
Light Magenta	013	029	045	061	077	093	109	125
Yellow	014	030	046	062	078	094	110	126
White	015	031	047	063	079	095	111	127

Foreground colors apply to the text and graphics lines. Background colors apply to the area on which text is printed. If the foreground and background colors are too close in shade, text and graphics are difficult to see.

The default settings for color monitors are:

- ◆ High = 31
- ◆ Normal = 30
- ◆ Reverse = 116
- ◆ Underline = 23



Note:

The shaded boxes in Table 2-1 indicate color combinations that will result in unreadable text - the background and foreground colors are identical.

- 3) Save the file and exit the editing program.
- 4) Restart Fastbase and check to see that the color changes took affect.

COMPUTER SETUP FOR BILLING

Billing files for the system are stored in either the \FASTBASE directory (or whatever alternate name was assigned during installation) or the \BILL2540 directory. When Fastbase retrieves billing files from the switch (cOmm49, Retrieve, SMDR File or Roaming user SMDR), the files are saved in the BILL2540 directory. If that directory does not exist, Fastbase stores the files in the FASTBASE directory instead.

To create a new directory for storing only billing files, follow these steps:

- 1) Switch to the root directory on the hard disk. At the DOS prompt, type:
`CD\`
- 2) Create a new directory. Type:
`MKDIR BILL2540`



Note:

Zetron's billing package, ZEBRA, automatically creates the billing directory during installation.

COMMUNICATIONS WITH THE MODEL 2540

Each Model 2540 has one or more communication ports, used for system maintenance only. These ports are useful for:

- updating the database
- performing diagnostics
- watching system traffic

The maintenance ports cannot be used for any other purpose.

The FASTNet Switch system operator(s) and Zetron both need access to the Model 2540 for maintenance and database management. The system operator uses an office computer and either a local (serial) or modem connection to establish a link with the Model 2540. Zetron must use a modem connection to establish a link with the Model 2540.

ZETRON MAINTENANCE PORT

Regardless of the method used to link the office computer to the Model 2540, Zetron requires a maintenance phone line into the modem maintenance port of the switch. This is particularly true during initial installation so we can configure the switch appropriately. The maintenance connection may be used later for answering questions, running diagnostics, and sending software updates.

Zetron recommends that the maintenance phone line:

- is separate from any of the lines into the FASTNet trunk cards
- is a standard end-to-end, loop start line
- does not have a Call Waiting feature
- is dedicated only to maintenance use

This phone line should be completely separate from any phone lines used for calls into FASTNet trunk cards. An end-to-end loop start line is required for the modem interface, like a typical home phone or a FAX line. Be sure that the line does *NOT* have a Call Waiting feature. If someone calls during a data transfer between the office computer and FASTNet Switch, the connection may be lost midstream. The call waiting tone is likely to cause modem communications errors, that may result in FASTNet operational problems.

It is recommended that the maintenance phone line be completely dedicated to this application. If the Model 2540 is not located in the office, the phone line must be dedicated, unless some kind of automatic or remote-controlled phone switch is employed to protect the line from interference during computer interfaces.

Shared Phone Lines

If the Model 2540 is located in an office, the phone line may be shared with another phone or device, such as a desk phone or a FAX line. If shared with a FAX line, use a switch to select either the Model 2540 or the FAX. This means that each time someone needs to link up to the Model 2540 via modem, the line needs to be switched over (and switched back when done).

“Shared-line” situations are usually acceptable for Local Connections, but are often inconvenient. When shared with a desk phone, people tend to pick up the line instead of letting the Model 2540 answer it. (Our default setting is to answer after two rings).

Overall, it is easiest and most reliable to *dedicate* a line to the Model 2540 for maintenance purposes.

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OFFICE COMPUTER CONNECTION

The system operator controls the database functions of the FASTNet Switch via computer. An interface between the office computer and the Model 2540's maintenance ports may be established in one of two ways:

1. Serial connection (Local) - A serial port in the computer is cabled directly to a serial port in the Model 2540.
2. Modem connection (Remote) - A modem in the PC calls the modem in the Model 2540.

Serial Connection (Local)

Use a serial connection if the computer is located close to the Model 2540 (distances under 60 feet). A direct connection between the serial port of the Model 2540 Switch and a serial port on the office computer can communicate at rates up to 9600 bps. The communication rates are lower with longer cables - refer to the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260).

Serial cables longer than 60 feet are not recommended, since induced EMI and other problems may arise, causing communications interference. Worse yet, a long serial cable in the wrong RF environment could possibly inject RFI into the FASTNet system, creating background noise or operational interference.

The advantages of the serial interface are:

- no additional phone lines are required to link up to the switch
- the communications rate is usually faster



Note:

Even though a local connection is used, a maintenance line is still required for Zetron's use as discussed in "Zetron Maintenance Port" on page 2-7.

Using the Modem Port as a Backup

Even when a local connection is used, it is nice to have a modem on-hand as an alternate access route into the switch. It may be used for the remote possibility of transferring software directly from Zetron to the FASTNet Switch. (Typically, the switch is used like a mailbox: we send a file to the switch, then the file is later transferred to the office computer).

With Local Connect, the modem maintenance port on the FASTNet Switch may not be used much. The system operator might use it to call from a home computer or from a portable computer located elsewhere to monitor the system. Most likely, the maintenance port would only be used by Zetron, to check or change something in the system programming.



Note:

The two different maintenance ports are mutually exclusive. If both *serial* and *modem* maintenance ports are installed in the Model 2540, only *one* port can be active at a time.

In other words, two people can't perform database or maintenance operations into the Model 2540 at the same time. This means that when Zetron is asked to interrogate or reprogram a particular Model 2540, the system operator must be sure that all Netview, TCE, and Fastbase communications to FASTNet are not actively interfaced. Otherwise, Zetron cannot connect to the Switch.

Installation Procedure

To setup the system for local RS-232 connection, follow the steps below:

- 1) Determine the office computer's serial communication port (COM1 or COM2 usually) and the connector type (DB-9 or DB-25).
- 2) Obtain or make an appropriate RS-232 connector cable. It should have a female 25-pin connector at one end and a female 9-pin or 25-pin connector for the computer's serial port at the other end. A serial cable can be purchased from Zetron (Part No. 709-7086) for connections within 60 feet.
- 3) Make the hardware connections between the computer and the Model 2540 as shown in Figure 2-3. Note that there are two 25-pin serial ports in the middle, left side of the Model 2540 chassis. The local connection port (labeled "Local") is located right below the printer port (labeled "Printer").

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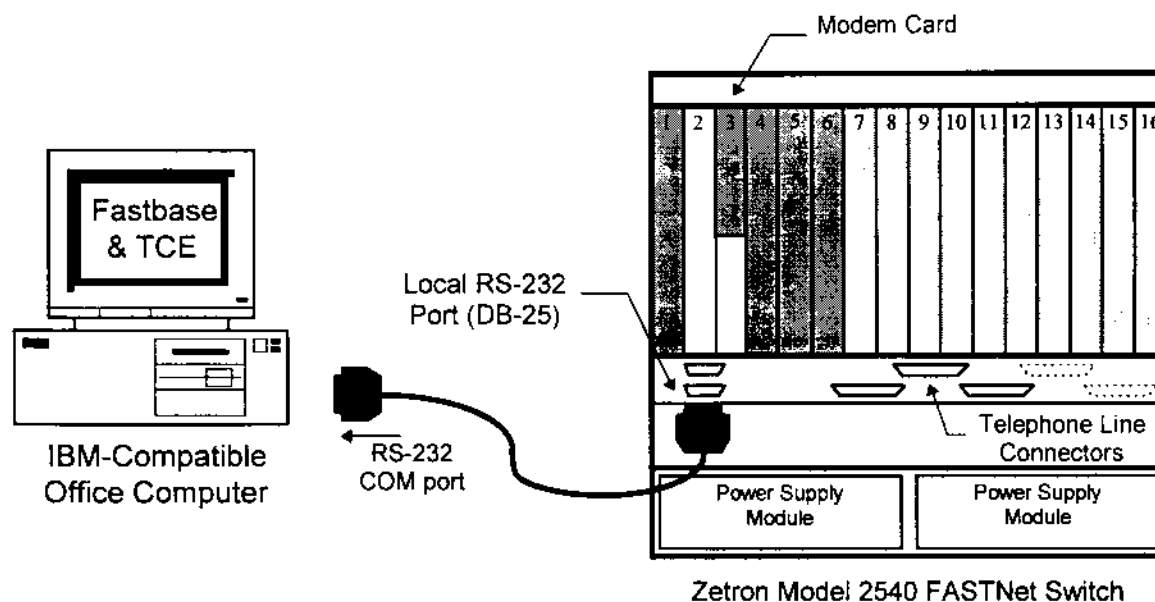


Figure 2-3. Local Connection to the Model 2540

- 4) Use the Trunk Card Editor program to setup the Model 2540 for local access, as follows:
- ☐ At the DOS prompt, change to the directory where TCE was installed in the previous subsection, by typing:
CD TCE <Enter>
 - ☐ Run the TCE program, by typing:
TCE <Enter>
The Trunk Card Editor main menu appears, as shown in Figure 2-4.
 - ☐ From the main menu, choose Edit, Nodes.
 - ☐ Press <F9> to start a new record.
 - ☐ Enter the node number of the new FASTNet Site.
 - ☐ Use the arrow keys to select the Serial FASTNet Access field.
 - ☐ Enter an L for local access. The Local window appears.
 - ☐ Enter the appropriate communications speed in the Baud Rate field.

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```
FASTNet Trunk Card Config. Editor V1.6 (c)1993-96 Zetron      (SUPERVISOR mode)
```

INDEX	
Z #	System Name
008954	

SYSTEM_DATA	
System Number:{008954}	Node #:
System Name:	[
Serial FASTNet Access:L ...	
PC Comm Port:1	LOCAL
Pound (#) Enable for	Baud Rate:9600
Mail Box Playback Me	
Retrieval Playback Method:N	
Mail Box Time Stamp Playback:M	
Maximum User Mail Box Operations:002	
Log SMDR Records?:Y ...	
Log SMDR Roaming Records?:N	
Date Format:M	
Time Format:1	
Edit Advanced Features?:Y ...	
Create Date: 07/24/96	
Alter Date:	

HELP
Enter the baud rate for local RS232 access: 300, 1200, 2400, 4800, or 9600

Figure 2-4. TCE Local Access Screen

Modem Connection (Remote)

Use a modem connection if the office computer cannot be located at the Model 2540 site. A PC modem and two separate phone lines are required for this type of communication. One phone line goes into the computer's modem, and the other goes into a modem card (Part No. 802-0039) in the Model 2540 (the maintenance line discussed above).

A dedicated line is not required just for the computer's modem. However, a separate line is more efficient for data transfer and system monitoring, since customer traffic is not impeded. All of the conditions described above for the Zetron maintenance connection also apply to this type of connection to the office computer. Zetron recommends that the modem phone line:

- is separate from any of the lines into the FASTNet trunk cards
- is a standard end-to-end, loop start line
- does not have a Call Waiting feature
- is dedicated only to maintenance use



Note:

If the switch and computer are located near each other, Local Connect is recommended, as discussed above.

Section 2. Installation and Communications

Installation Procedure

Figure 2-5 illustrates the hardware connections between the office computer and a remotely located Model 2540.

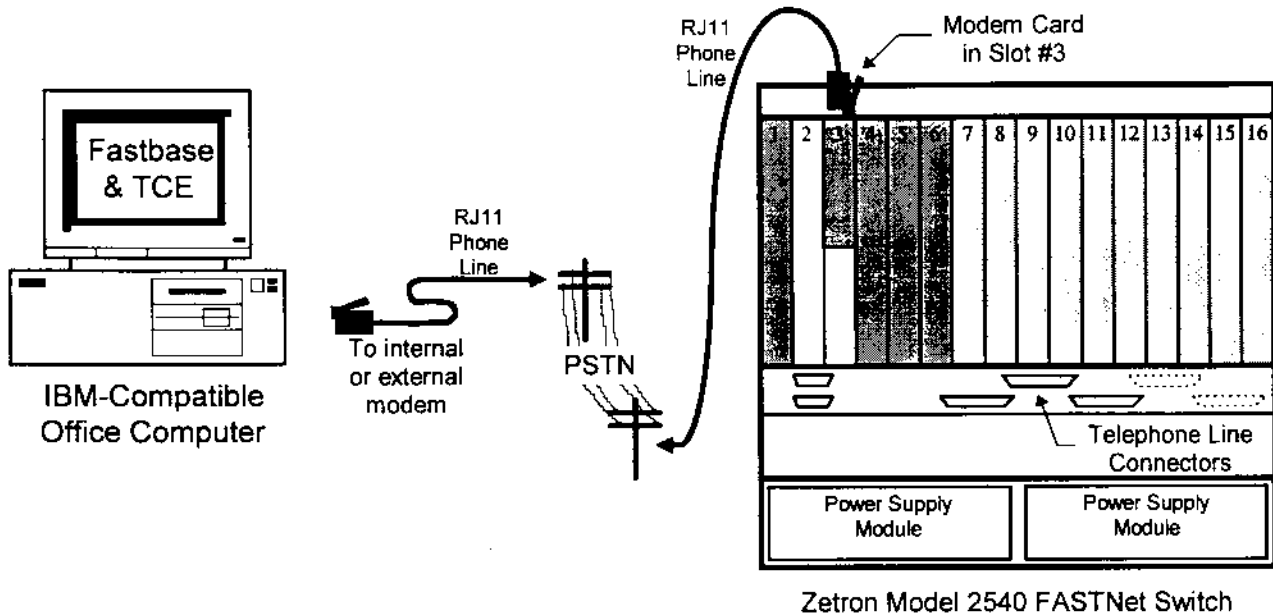


Figure 2-5. Modem Connection to the Model 2540

To setup the system for modem connection, follow the steps below:

- 1) Make sure that an optional modem card (Part No. 802-0039) is installed in slot #3 of the FASTNet Switch chassis.
- 2) Determine the office computer's modem communication port (usually COM1 or COM2).
- 3) Connect the Model 2540 modem card to an end-to-end, loop start telco line. Use standard RJ-11 phone cable and connect to the "WALL" jack on the modem card (see Figure 2-6). Table 2-2 shows the wiring configuration for the telco jacks on the modem card.



Note:

Make sure to use the modem jacks labeled "WALL," "LINE," or "TELCO". Do not connect to the "PHONE" or "LOCAL" jacks, as they are for telephone sets only.

Table 2-2. Modem TELCO Jack Wiring

Pin No.	Signal Name	Function
1	---	Unused
2	TIP 1	Coupled between "Phone" and "Wall" jacks
3	RING	
4	TIP	TELCO "TIP" wire
5	RING 1	Coupled between "Phone" and "Wall" jacks
6	---	Unused

Note: These pinouts apply to both "modular" telephone jacks of the Modem Card (802-0039)

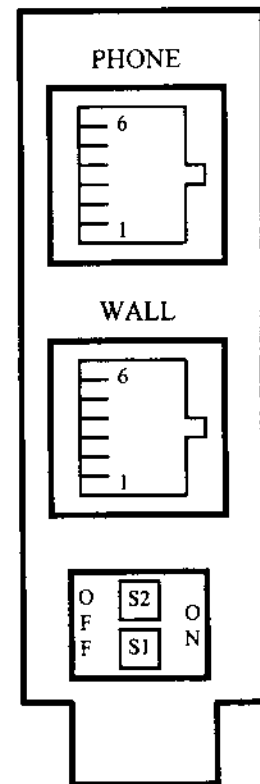


Figure 2-6. Modem Card

- 4) Connect the office PC modem to a standard telco line using RJ-11 cable. If the PC modem is external, connect the modem to the computer's serial COM port using RS-232 cable (usually standard 25-pin male connectors on both ends).
- 5) Use the Trunk Card Editor program to setup the Model 2540 for modem access, as follows:
 - ☐ At the DOS prompt, change to the directory where TCE was installed in the previous subsection, by typing:
 CD TCE <Enter>
 - ☐ Run the TCE program, by typing:
 TCE <Enter>
 The Trunk Card Editor main menu appears.
 - ☐ From the main menu, choose Edit, Nodes.
 - ☐ Press <F9> to start a new record.

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- ☐ Enter the node number of the new FASTNet Site.
- ☐ Use the arrow keys to select the Serial FASTNet Access field.
- ☐ Enter an M for modem access. The Modem window appears as shown in Figure 2-7.

```
FASTNet Trunk Card Config. Editor V1.6 (c)1993-96 Zetron      (SUPERVISOR mode)
```

INDEX	
Z #	System Name
008954	

SYSTEM DATA	
System Number:[008954]	Node #:
System Name:	
[]	
Serial FASTNet Access:M ...	
PC	MODEM
Phone #:	
PC Modem Baud Rate:	9600
Mail Box Time Stamp Playback:M	
Maximum User Mail Box Operations:002	
Log SMDR Records?:Y ...	
Log SMDR Roaming Records?:N	
Date Format:M	
Time Format:1	
Edit Advanced Features?:Y ...	
Create Date: 07/24/96	
Alter Date: 08/09/96	

HELP
Enter phone number to use to access the switch.

Figure 2-7. TCE Modem Access Screen

- ☐ Enter the Phone # to connect to the maintenance modem line in the FASTNet Switch.
- ☐ Enter the appropriate communications speed in the Baud Rate field.

Adjusting the Modem Initialization String

If the site connection is made through the office PC's modem, it may be necessary to alter the modem initialization string to ensure proper handshaking. Fastbase and TCE are designed to talk to Hayes-compatible 9600 bps modems that respond to standard ATZ and ATDT commands.

To change the modem initialization string, choose Other, Change PC Modem Params from the TCE main menu. The Status box shown in Figure 2-8 should appear in the lower left corner of the screen.

Section 2. Installation and Communications

```
STATUS
CHANGE MODEM INIT STRING

Current settings:
Tone or Pulse = T
Init Str = AT E1 Q0 X2
Enter T for tone, P for pulse: _
```

Figure 2-8. TCE Change Modem Init String Status Window

Enter a T for tone dialing or a P for pulse dialing. Then enter the new modem command string, beginning with "AT". Refer to the modem manual for more information on modem commands.



Note:

If you are unsure about modem initialization commands, call Zetron. Be sure to have your modem manual handy for easy reference before calling.

Section 2. Installation and Communications

DIRECT CONNECTION TO MODEL 49/459

When a Model 49/459 is directly connected to a Model 2540, follow this procedure for modem access (via the Model 2540) to the Model 49 or 459 internal modem.

You can also access the Model 49/459 by connecting the PC to the Model 49/459 RS-232 port directly or via an external modem connected to the Model 49/459 RS-232 port. "Local Shop" and "External Modem" programming are described in the *Model 49 Multibase or Ebase Operation Manual* (Part No. 025-9297 or 025-9402) or *Models 459 & 452 TCBase Operation Manual* (Part No. 025-9451).

When accessing the internal modem on the Model 49/459 via a FASTNet, connect one of the Model 2540 dual 4-wire trunks directly to the telephone port (E & M 4-wire) on the Model 49/459 as illustrated in Figure 2-9.

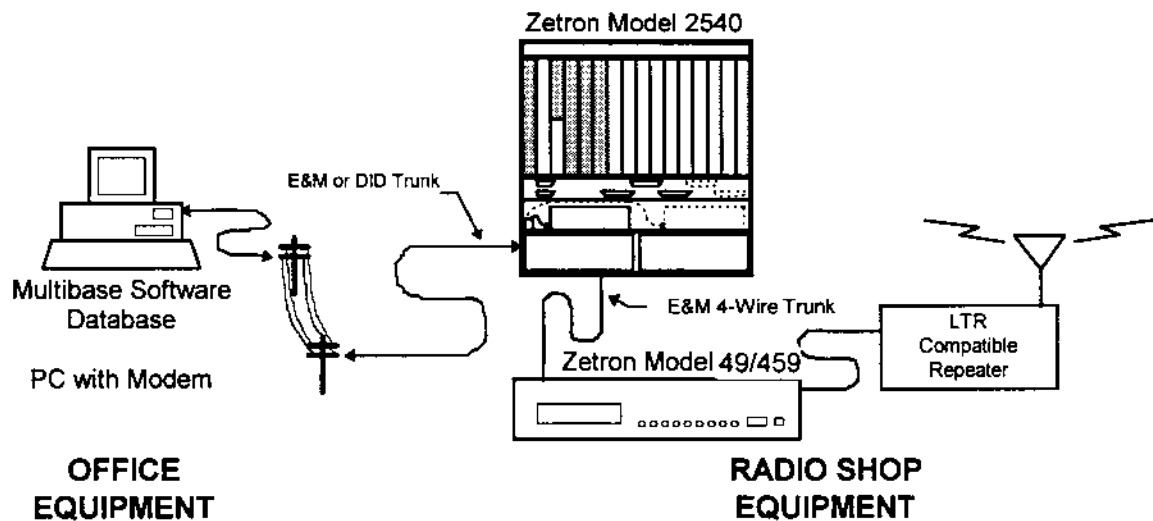


Figure 2-9. Model 49/459 Programming via FASTNet Trunk

The Model 2540 must be configured properly to allow the audio to and from the incoming trunk to be immediately cut through to the Model 49/459. This is done by setting up an incoming DID number on the Model 2540 that invokes a PSITExxx script (where xxx is the site number) that immediately connects the audio to a trunk directly connected to the Model 49/459. Refer to "Node Users" in Section 4, for further discussion of scripts.

Installation Procedure

Use the following procedure to program a Model 49/459 via FASTNet trunks:

- 1) From Fastbase, select editNet / node User and create a user record with the phone number you wish to dedicate to programming a particular Model 49/459 site.

For this discussion, and the example of Figure 2-10, the phone number for programming site 1 is 763-1742.

Section 2. Installation and Communications

Whenever a site is created in Fastbase, a script is automatically created for connecting to the site via modem. The script name is PSITExxx (where xxx is the site number). For example, if site 5 is created, a script named PSITE005 is also created for connecting the Model 49/459 via modem and the Model 2540.

As shown in Figure 2-10, the PSITE001 script is invoked by phone number 763-1742 to make a modem connection to site #1.

Model 2540 FASTNet Database Manager V7.10 (c)1992-99 Zetron (SUPERVISOR mode)

INDEX			
PhoneNo	User's Name		T
0000000			S
0001111	TEAMTALK SITES 2-5		S
0001234	TEAMTALK SITES 1-5		S
0002222	TEAMTALK SITES 2-5		S
0006300	TEAMTALK SITES 1-5		S
0016400	CALLERD BASE #		N
0016401	CHOICE 1, VMAIL ONLY		S
0016402	CHOICE 2, RING & VM		S
0016403	BILL'S PAGER		P

NODE 001	
NODE USERS	
Phone #:	[7631742]
Name:	[PROGRAM SITE 1]
User Type:	[S] Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: PSITE001	
Parms:	

HELP	
Enter parameters to be used with this script.	

Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 03/08/95	
Alter Date:	

Figure 2-10. Node User Setup for Model 49/459 Programming

- 2) Make sure this script record gets updated to the Model 2540 by selecting Commnet / Update / Changes from the TCE main menu.
- 3) From Multibase, Ebase, or TCBase, select the Edit49 (or Edit) / Site config menu item. In the Site Access field, enter "X" if you are calling with the office PC modem in originate mode and the Model 49/459 modem in answer mode. The window shown in Figure 2-11 appears.

Section 2. Installation and Communications

Model 49 Multi-Site Database Manager V6.20 (c)1990-98 Zetron (SUPERVISOR mode)

INDEX		
Site	Site Name	I
0000	TEST	Y
0001	TEST RACK DATA	Y

SITE_CONFIG	
Site Number:	[0001]
Site Name:	[TEST RACK DATA]
Site Access:	X ... PC Comm Port:1
EXT MODEM	
Ed	Phone #:7631742;1234
Pr	Baud Rate:1200
1	
2:	Start: 00:00 Stop: 00:00
Unassigned Users:V	
Idle Msg. Time:10	
COR Hold Time:0.3	
Repeater Hold Time:00.3	
Repeater Timeout:180	
Cross Busy Delay:0	
Interconnect:[Y] ...	
Create Date: 09/28/94	
Alter Date: 09/29/94	

HELP
Enter phone number to use to access the site.

Figure 2-11. Multibase Setup for FASTNet Trunk Interface

- 4) Enter the FASTNet Phone # that invokes the script to connect to this site followed by “;” and the number to be overdialed into the Model 49/459. For the example (assuming the Model 49 is programmed for 4-digit access code over dial and access code 1234 is programmed to bring up the Model 49 internal modem answer tone), use 763-1742;1234.
- 5) Enter 1200 in the Baud Rate field for the speed of the modem in the PC.
- 6) Enter the PC Comm Port # for the computer’s internal modem card. This Comm Port # could also be a serial port on the computer that is then connected to an external modem.
- 7) Set up the office computer (complete with modem) as well as the internal modem on the Model 49/459(s) following the instructions in the *Model 49 Multibase or Ebase Operation Manual* (Part No. 025-9297 or 025-9402) or *Models 459 & 452 TCBase Operation Manual* (Part No. 025-9451).
- 8) Select cOmm49 (or cOmm) / Monitor from the Multibase/Ebase/TCBase main menu. The PC should dial the DID telephone number to the Model 2540. When the Model 49/459 answer tone sounds, press Enter on the PC so that the numbers after the “;” are overdialed into the Model 49/459. The Model 2540 establishes the audio connection to the Model 49/459. The PC modem handshakes with the Model 49/459 modem and the connection is made.

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3. FASTBASE OVERVIEW

FASTNET OUTBOUND DIALING SEQUENCE

Before programming a FASTNet Switch it is helpful to understand the sequence of events which take place when a call is made, and where each part of the database programming fits into the call process.

Figure 3-1 provides an illustration of the sequence of events when a mobile dials a landline (outbound through FASTNet). Assume for this example, that the mobile is on a Model 49 - controlled radio site⁽¹⁾ (the superscripts in this paragraph correspond to the circled numbers in Figure 3-1). The call sequence is as follows:

- A mobile user keys, receives dial tone and dials⁽²⁾ a local telephone number.
- While the user is dialing, the Model 49⁽³⁾ connects to the FASTNet Switch and sends a packet of information containing the user's FASTNet ID. The FASTNet Switch can then look up the user in its database⁽⁴⁾. The user's database record tells the switch which **Dialing Plan**⁽⁵⁾ to use for this call and how to toll restrict it.
- The switch then receives another packet of information from the Model 49 containing the number that the user dialed. The switch compares this number against the user's assigned **Toll Restriction Table** (not shown in the figure). If the number is not toll restricted, the switch then looks for a match in the dialing plan. When the switch finds a match in the dialing plan, it knows which **Least Cost Routing Table**⁽⁶⁾ to use. The least cost routing table tells it which outgoing trunk group to try first.
- Once a trunk group with an available line is found, the corresponding **Outdial Program**⁽⁷⁾ is used to dial digits out to the available trunk.
- Once dialing is done, the audio is connected⁽⁸⁾ between the outgoing trunk line and incoming line from the mobile user. In this example, the audio is connected to a landside telephone of the PSTN (Public Switched Telephone Network).

Section 3. Fastbase Overview

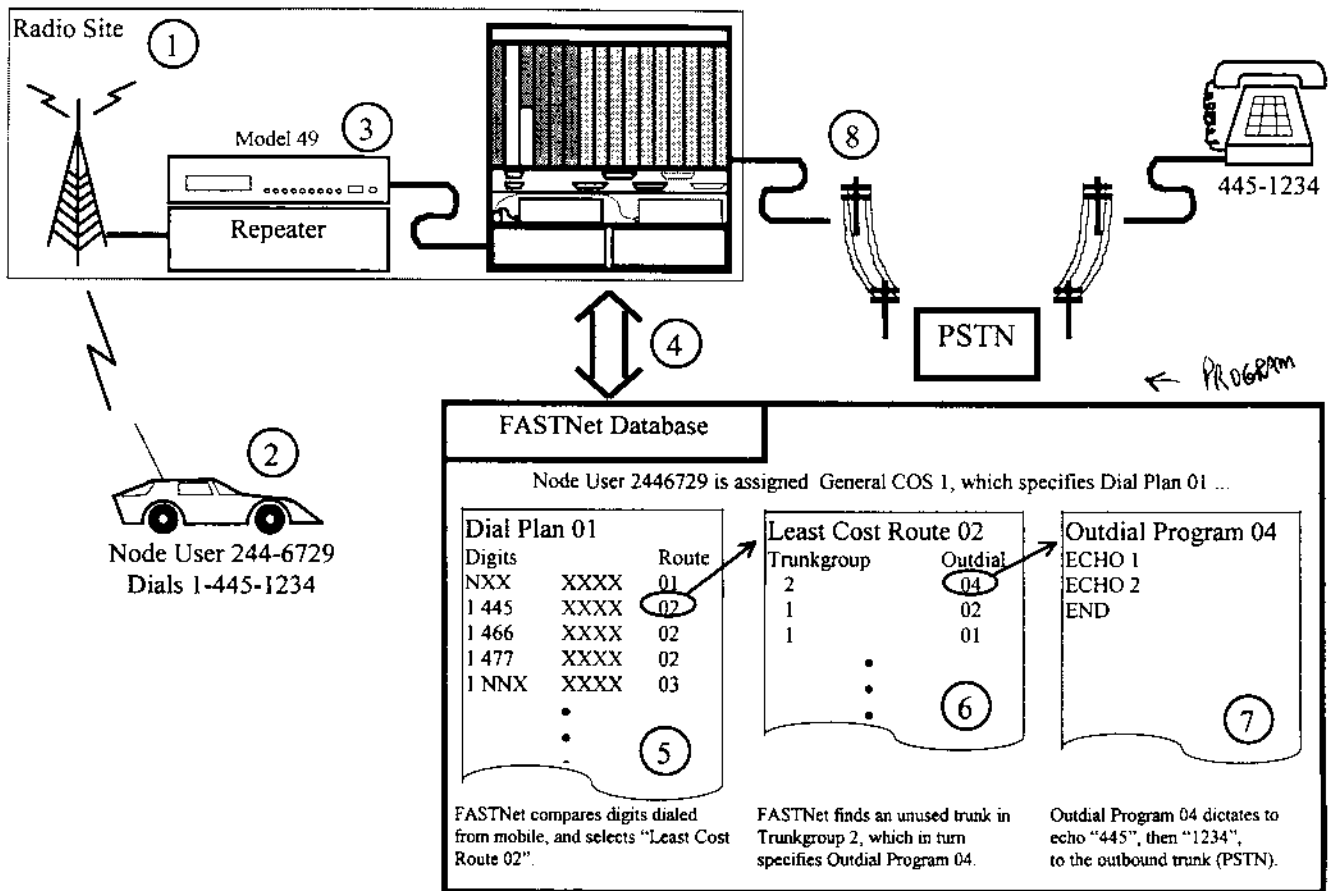


Figure 3-1. FASTNet Outdialing Sequence

Mobile-to-Land Call Processing

For mobile-to-land calls through FASTNet, the general sequence of events is outlined in Figure 3-2. The Model 49 translates the LTR™ ID into a FASTNet ID and then sends this ID to the FASTNet. Classes of Service are broken into three major categories: General COS, Toll COS, and Roam COS.

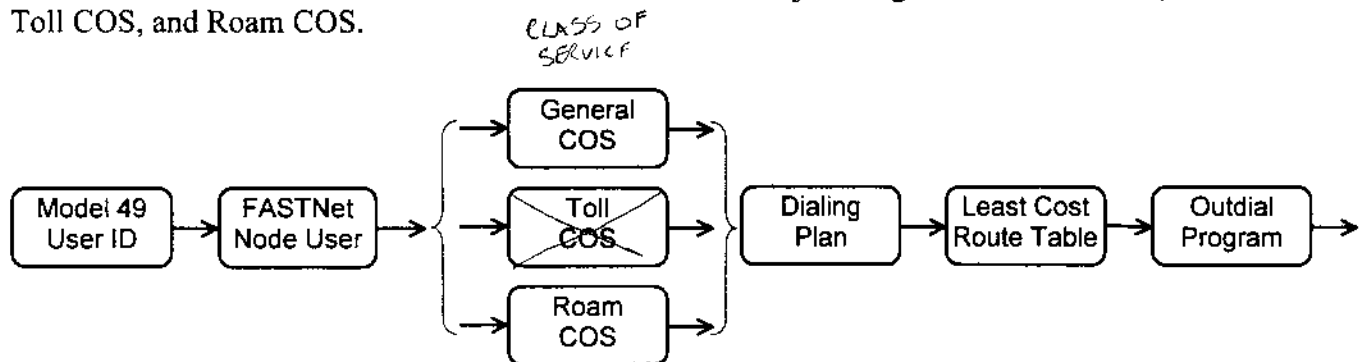


Figure 3-2. Call Processing, Mobile-to-Land

Land-to-Mobile Call Processing

Now follow a landline originated call through the switch (see Figure 3-3). Two main types of incoming lines are used: DID (direct inward dial) and end-to-end with overdial.

For an E&M or DID line type, the line rings, the Model 2540 answers after a programmed number of ring cycles, then the CO automatically sends feed digits. Typically, the telco sends 3, 4, or 5 feed digits as determined in their service contract. The FASTNet Switch must be programmed to accept the proper number of feed digits. These feed digits are then added to a prefix to make up the user's FASTNet ID.

For the end-to-end case, the incoming line rings, FASTNet answers after the programmed number of ring cycles and plays a prompt "Please dial the mobile number". The caller then dials a 2 to 7-digit Node User ID. Once the FASTNet Switch has received a Node User ID, it looks up the user record. The user record contains the mobile user's current *route*. This route contains the site script to run, the ringout time, and the mobile's LTR™ ID on that site. The site script contains the trunk group to seize in order to connect to the site.

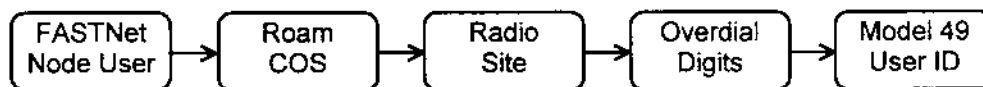


Figure 3-3. Call Processing, Land-to-Mobile

INTRODUCTION TO DATABASE OPERATIONS

Fastbase is Zetron's advanced multi-node software management system that runs on a PC-compatible office computer. Fastbase manages the Model 2540 FASTNet database information. Fastbase also communicates with the FASTNet Switch to retrieve air time, interconnect billing, and repeater loading information, and monitor the site in real-time. Once the Fastbase software is installed into the computer, it may be operated any time.

In order to facilitate regular and prudent system maintenance, memory "backup" procedures for programming data have been made simple. System recovery following lightning strikes or other catastrophic conditions may be greatly enhanced with backup data.

Fastbase Organization

Fastbase is a typical database program in its format and function. The program stores different types of data in a complex hierarchy of information.

A tree structure best describes Fastbase's organization. Like a tree, each branch (menu) in the program has twigs (other menus) attached to it. And each twig (submenu) has several leaves (data fields) attached to it.

The result is that entering or changing a single field in Fastbase may require only two keystrokes, or several different callouts. In addition, changes to the database fields often affect several other pieces of data.

Section 3. Fastbase Overview

Database Terminology

Throughout this manual, many keywords are used to refer to the Fastbase database and its contents. The vocabulary is fairly standard for all software database applications. A brief definition and example of each term follows.

<i>active; highlighted; selected</i>	Describes the current window or field. An active window is always shaded or colored differently on the Fastbase screen. Ex. Node config is the selected field in the Edit menu.
<i>box; window</i>	Describes a framed text box on the Fastbase screen. Ex. The Node Config box has 21 separate fields.
<i>data window</i>	Describes a window that shows one data record in full detail. Ex. The Node Config data window contains the Site Name field.
<i>field</i>	Describes a specific type of entry, in a specific location in the database. A field doesn't point to other information like a menu does. It requires an actual keyboard entry. Ex. Access the PC Comm Port field by selecting Node config from the Editnet menu.
<i>index window</i>	Describes a window that shows a nine record portion of the data file. The index window gives an overview of which records are available. Those data fields used for sorting are shown in the index window. The item selected in the index window is shown in the related data window. Ex. The Node config index window lists all the programmed nodes.
<i>key field</i>	Describes a field that can be used for sorting the database. Ex. The User type field in the Node users window is keyed for sorting.
<i>menu</i>	Describes a word or phrase that points to other menus or fields. A menu doesn't request an actual database entry, it requires a selection to direct the program. Ex. The otHer menu has four possible choices; Change pc modem parms, change 2540 <-> pc passWord, create Fastnet user file, and Exit.
<i>record</i>	Describes a set of database fields. One subscriber's database information is a record. Ex. The record for Phone # 555-1212 is invalid.

sort Describes a reorganization of the database information by a specified data field.
Ex. Sort the data alphabetically by user Name.

Figure 3-4 shows a sample Fastbase screen and points out the database terms defined above.

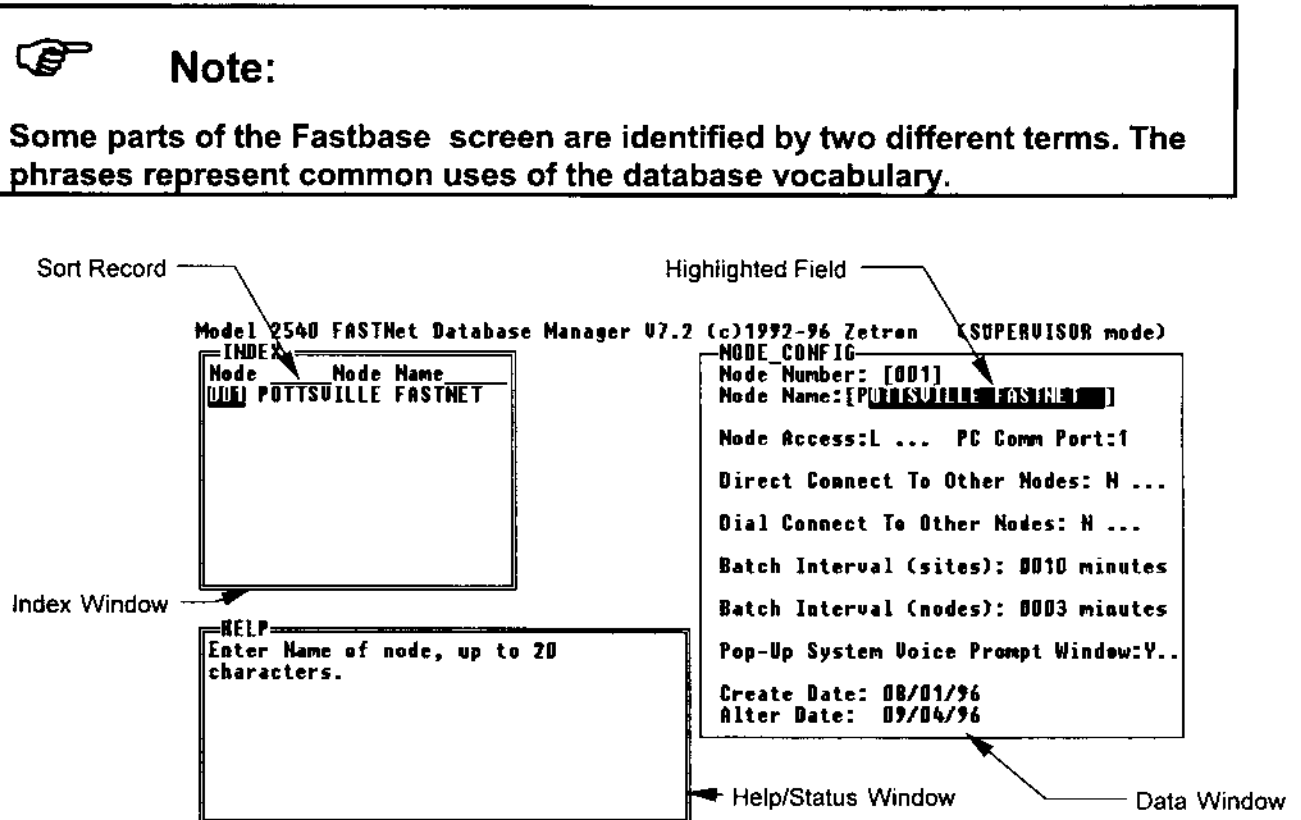


Figure 3-4. Fastbase Terminology Examples

RUNNING FASTBASE

Once Fastbase is installed (see Section 2), *run* the program as follows:

- 1) Go to the Fastbase directory, by typing at the DOS prompt:

```
CD \FASTBASE <Enter>
```

- 2) Start the program, by typing:

```
FASTBASE <Enter>
```

Section 3. Fastbase Overview

FASTBASE MADE SIMPLE

The Fastbase program is reasonably straight-forward and user friendly. Once the system operator learns a few simple keystrokes and the organization of the data, changes and updates to the system configuration are quick and easy. The following subsections describe the basics of Fastbase and how to use the program efficiently.

On-Screen Help / Status

A box in the lower left corner of the screen is labeled "HELP". This window prompts the operator with information about using Fastbase. The information is "context sensitive" and changes with the currently-viewed screen. The window also provides "STATUS" information when the database is off working (retrieving data, connecting to a site, etc.). Figure 3-5 shows a typical example of on-screen help. This window provides instant guidance whenever the user is unsure about what function the database is performing (status) or what type of entry is required in the selected field (help).

```
Model 2540 FASTNet Database Manager V7.2 (c)1992-96 Zetron (SUPERVISOR mode)
_ editNet Commnet Printnet Backup Restore other _
Node config
radio Sites
node Users
General cos
Toll cos table
Roam cos table
Dialing plan
Least cost route
Outdial table
HELP
Select item with arrow keys and
ENTER or capital letter. ESC to quit
EditNet Radio Sites allows the Site
Configuration data for Sites
connected to this Node to be viewed
as well as modified.
```

Figure 3-5. Typical Fastbase "HELP" Window

Index / Data Windows

Access the data in each Fastbase computer file by selecting the appropriate submenu items from each main menu category. These selections, in turn, yield an Index window and a Data window. The Index window shows a nine record portion of the data file, while the Data window shows one data record in full detail.

The Index window on the left side of the screen gives a quick overview of a few data records. Those data fields that are used for "sorting" are shown in the index window. Use the left or right arrow keys (← and →) to select a particular index field to "sort" on. Use the up or down

arrow keys (↑ and ↓) to move backwards or forwards in the data file. Use the <PgUp> or <PgDn> keys to jump nine data records at a time.

Press the <Enter> key to move to the data window on the right side of the screen. Now keystrokes move the cursor around the data fields. Press <Esc> to return to the index screen.

<F1> Guide Window

The <F1> key accesses the Guide Window (Zetron 'help' window) from the Index and Data windows during editing. The *Index Windows* and *Data Windows* are accessed from the submenu screens (selected from the main menu).

There are no Guide Windows for the main menu items. Specific submenu items must be selected before the Index Window and Data Window are available. An attempt to use the Guide Window <F1> from the main menu, or from the submenu (when specific items are not yet selected), causes the first character space of the highlighted field to flash. This *flashing cursor* indicates that no Guide Window <F1> is available at this menu level.

The Guide Window contains a description of the function key operations. Guide Window key functions are dependent upon which window (Index or Data) the Guide Window is invoked from [by pressing F1]. There are two basic Guide Windows, as explained in the following subsections.

Index Window Guide

When selecting <F1> from the *Index Window* of the editNet menu, the Guide Window shown in Figure 3-6 appears.

```

Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)

INDEX
Node      Node Name

HELP
Edit: press ENTER/RETURN/<-+
Guide Window: F1
Done: Esc

GUIDE
Function Keys:
F1-GUIDE on/off
F6-COPY Nodes
(Node Config Only)
F7-DELETE record F8-FIND record
F9-NEW record    F10-DONE editing
Changing Index to File (re-sort File):
LEFT & RIGHT arrow
Moving Through Records:
One Record: Up or Down arrow
One INDEX Window: PGUP or PGDN
First, Last: Ctrl-PgUp, Ctrl-PgDn
Other Keys:
Alt-Fx -saves a record template
Ins -NEW record Del -DELETE record
  
```

Figure 3-6. Index Window Guide [F1]

Section 3. Fastbase Overview

Data Window Guide

When selecting F1 from the *Data Window* of the editNet menu, the Guide Window shown in Figure 3-7 appears.

```
Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)
INDEX
GUIDE
Function Keys:
F1-GUIDE on/off      F2-RESET record
F3-RECALL record    F4-FILL record
F5-UNDO entry
F7-DELETE record    F8-FIND record
F9-NEW record       F10-SAVE record
note: data always saved, F10 unneeded
Record Positioning Keys:
PGUP Previous      PGDN Next
CTRL-PGUP First   CTRL-PGDN Last
Field Positioning Keys:
HOME First        END Last
UP ARROW Previous
DOWN ARROW Next on current window
ENTER Next - links if sub-window
Other Keys:
Alt-Fx saves a record template
Shift-Fx recalls a record template
ESC back to previous window
including return to INDEX
NODE_CONFIG
Node Number: [001]
Node Name:[TEST AJH BENCH      ]
Node Access:L ... PC Comm Port:1
Direct Connect To Other Nodes: N ...
Dial Connect To Other Nodes: N ...
Batch Interval (sites): 0001 minutes
Batch Interval (nodes): 0001 minutes
Pop-Up System Voice Prompt Window:Y..
Create Date: 02/27/95
Alter Date:
```

Figure 3-7. Data Window Guide Screen [F1]

Moving Through The Database

Each menu and submenu item has one and only one capital letter in it. The capital letter provides a keyboard shortcut to the item. For example, from the main menu the miscellaneous menu is listed as “otHer”. In this case, entering an “H” from the keyboard automatically selects that menu.



Note:

The capital letter that selects a menu item is not always the first letter of the word.

Secondary Menus

Many fields in the different Data windows call out other fields, depending on the selected entry. When a field points to other fields, the connection is identified by three dots (...) on the Fastbase screen.

Keyboard Entries

Moving through the database is very easy once a few important keystrokes are learned. Always use the <Esc> key to finish an operation and return to the main menu. Table 3-1 shows each keyboard entry and what action it performs in Fastbase. The keys are listed in order of appearance on the keyboard from top left to bottom right. Figure 3-8 highlights the important keys on an extended PC keyboard.

Table 3-1. Fastbase Keyboard Operations

Key Name	Key Label in Figure 3-8	Function in Index Window	Function in Data Window
Escape	Esc	Back to main menu	Back to index window
F1- F10	F1, F2, F3,... F10	Guide information on Fn keys	Guide information on Fn keys
Backspace	← Back	Previous index field	Move back one character
Insert	Ins	Insert new data record	Insert one character
Home	Hm	Move to top of index window	Move to top of data window
Page Up	PgUp	Previous index window	Previous data record
Tab	Tab	Next index field	Accept default data and move to next data field
Shift + Tab		Previous index field	
Delete	Del	Delete data record	Delete one character
End	End	Move to bottom of index window	Move to bottom of data window
Page Down	PgDn	Next index window	Next data record
Enter	↵ Enter	Move to data window	Enter typed data into field and move to next data field
Shift (appears twice)	⇧ Shift	No function by itself	No function by itself
Up Arrow	↑	Previous record	Previous data field
Left Arrow	←	Previous index field	Move back one character
Down Arrow	↓	Next record	Next data field
Right Arrow	→	Next index field	Move forward one character

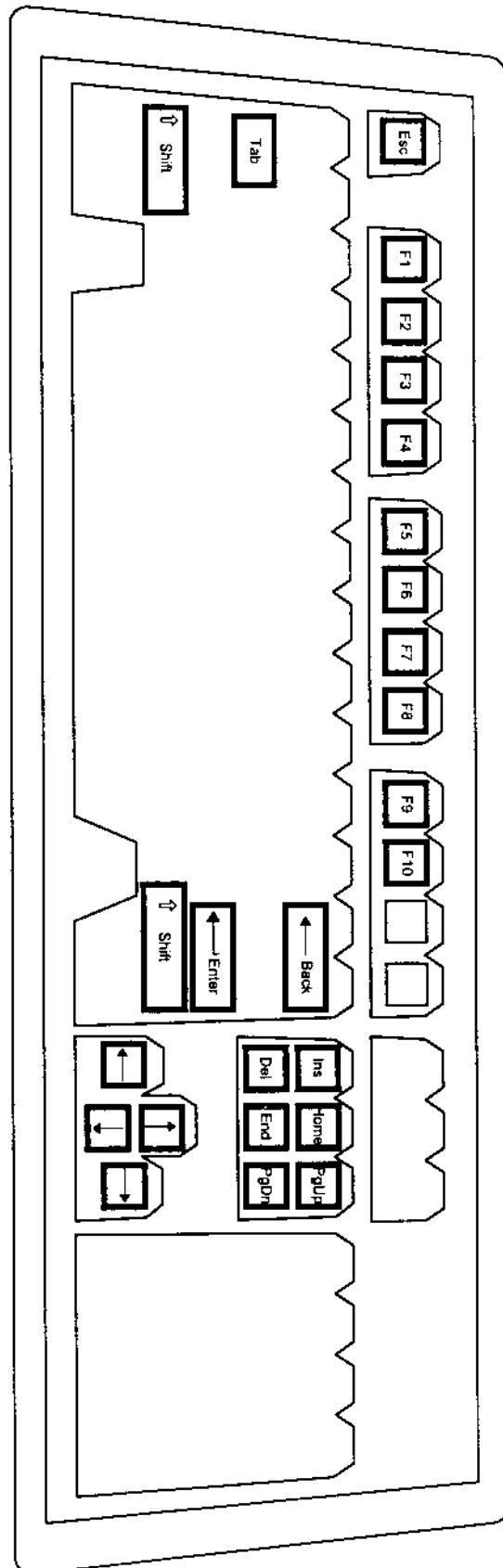


Figure 3-8. PC Keyboard for Fastbase Operations

Using Record Templates

After programming a few new records, some patterns may develop. For instance, several fields, such as those found in the node Users window, are set identically for many different records. Some of the information, however, does change.

Ten different “data templates” can be defined in each data window to save typing time. A template is retrieved with the assigned function key to fill-in a new data record.

Defining New Data Templates

To define a new template, follow these steps:

- 1) From the Index window (in any of the Editnet menu choices), press <F9> to start a new record.
- 2) Fill-in the template in the Data window with the information that is identical for many users. Be sure to leave the ID field blank.
- 3) Press and hold <Alt>. Then press one of the ten function keys (<F1> through <F10> on the keyboard).

The function key selected is now assigned to the template.

Using Data Templates

To use a template, follow these steps:

- 1) From the Index window, press <F9> to start a new record.
- 2) Press and hold <Shift>. Then press the function key corresponding to the desired template.

Fill-in the blank fields appropriately to finish defining the record.



Note:

The templates are saved automatically when Fastbase is properly exited.

Searching the Database

When the node User database gets large (more than a few hundred users), scrolling up and down through the database to locate an individual record is time consuming. Fastbase can search and find specific records easily using any field in the Index window.

Section 3. Fastbase Overview

To find a particular record, follow these steps:

- 1) Access the Index window (in any of the Editnet menu choices).
- 2) Select the desired search field (within the Index window) using the left and right arrow keys (← and →).
- 3) Press <F8>. Fastbase moves the cursor into the Data window, to the selected field.
- 4) Type in the data for the desired record.
- 5) Press <Enter>.

Fastbase finds the record and displays it in the data window. If the record isn't found, Fastbase returns the message "CAUTION! not exact match". The next record is displayed in the User ID window.

Alert and Status Messages

Messages that are displayed on the computer screen to alert you to special actions come up in the lower left corner of the screen, below the Index window. During some operations, such as communicating with the sites, the Help window changes to a Status window to inform the operator of requested operation progress. A sample status window is shown in Figure 3-9 for the Commnet / Verify function.

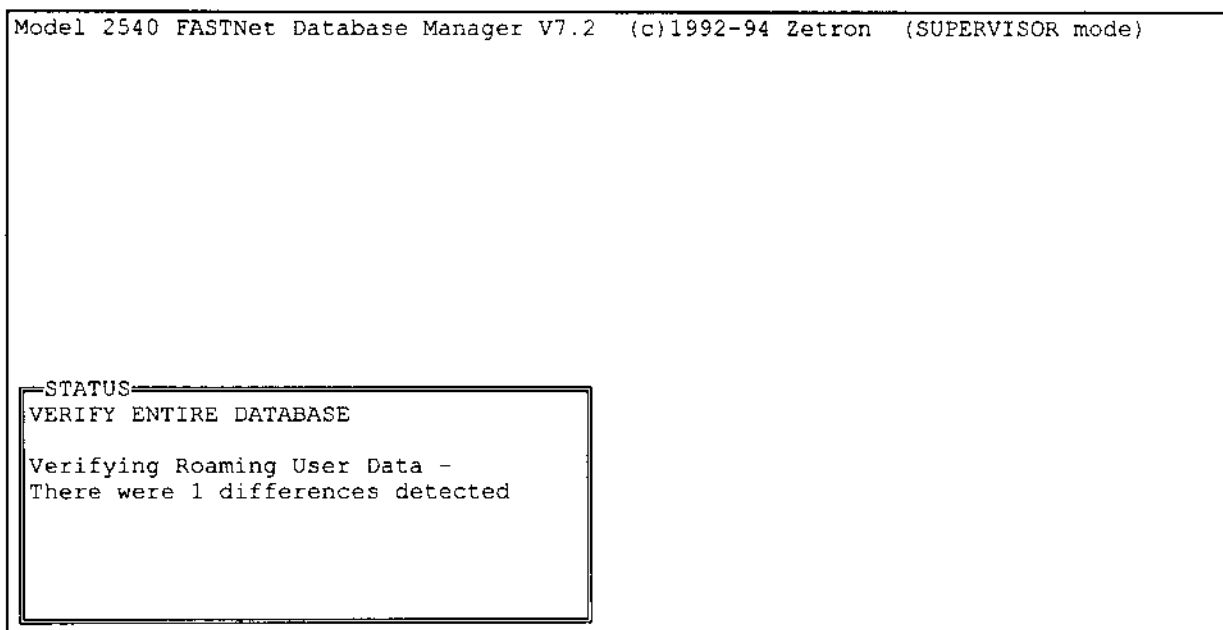


Figure 3-9. Sample Status Information Screen

MENUS

Once Fastbase is running, the main menu screen shown in Figure 3-10 appears.

```

Model 2540 FASTNet Database Manager V7.2 (c)1992-96 Zetron (SUPERVISOR mode)

_ editNet Commnet Printnet Backup Restore other _

Node config
radio Sites
node Users
General cos
Toll cos table
Roam cos table
Dialing plan
Least cost route
Outdial table

HELP
Select item with arrow keys and
ENTER or capital letter. ESC to quit

EditNet Node Config allows the Node
Configuration data to be viewed and
modified.

```

Figure 3-10. Fastbase Main Menu

The menu line lists six main selections (described below) that Fastbase can perform. Each main choice has a list of sub-menu items to select from as follows:

editNet	Create or make changes to the Model 2540 FASTNet database files. Submenus: Node config, radio Sites, node Users, General cos, Toll cos table, Roam cos table, Dialing plan, Least cost route, Outdial table.
CommNet	Communicate with the Model 2540 FASTNet Switch. Submenus: Update, get/Verify, Retrieve, Monitor, Other, Netview.
PrintNet	Produce printed listings of the Model 2540 database information. Submenus: node Config, radio Sites, node Users, General cos, Toll cos table, Roam cos table, Dialing plan, Least cost route, Outdial table.
Backup	Make backup copies of the database files to floppy diskettes. Submenus: Config data, SMDR call detail, SMDR Roaming call detail.

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Restore	Copy database backups into the working database files. Submenus: Config data, SMDR call detail, SMDR Roaming call detail
otHer	Miscellaneous Fastbase functions. Submenus: Change pc modem parms, change 2540 <-> pc passWord, Exit.

Editing

The editNet menu allows additions and changes to the Model 2540 FASTNet database. To begin editing, first select editNet / Node config and create a node by entering a number in the Node Number field. Radio Sites, Node Users, Classes of Service and Dialing Plans are then entered for each existing node as desired.

Communications

The Commnet menu allows the office PC to communicate with the Model 2540 sites for updating database information, retrieving billing and status information, and monitoring. The Commnet menu is shown in Figure 3-11.

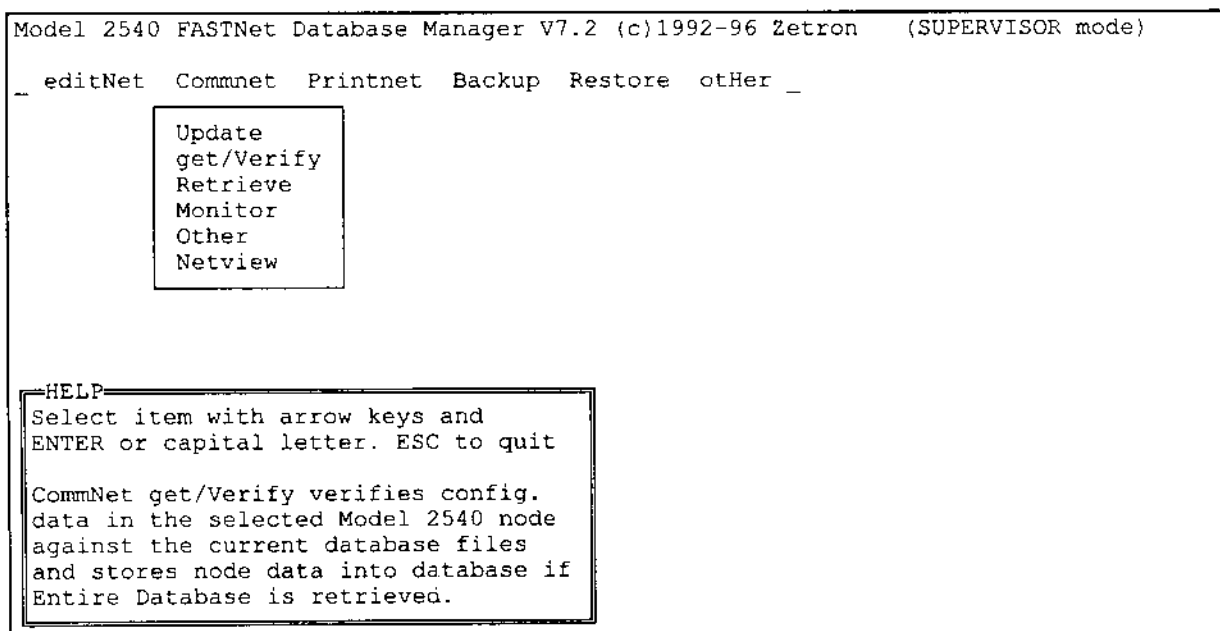


Figure 3-11. Fastbase "Commnet" Menu

If more than one node exists, Fastbase prompts the operator to select the correct node. When a node has been selected, Fastbase automatically connects to the Model 2540 using the method previously defined in the Node Configuration (see Office Computer Connection in Section 2). Once the connection has been established to the node, Fastbase allows the operator to select other options from the Commnet menu without disconnecting.

Updating FASTNet Programming

To update a Model 2540 site with a stored database, select Commnet / Update. A level 2 Submenu window appears, as shown in Figure 3-12, from which the operator can choose what is to be updated.

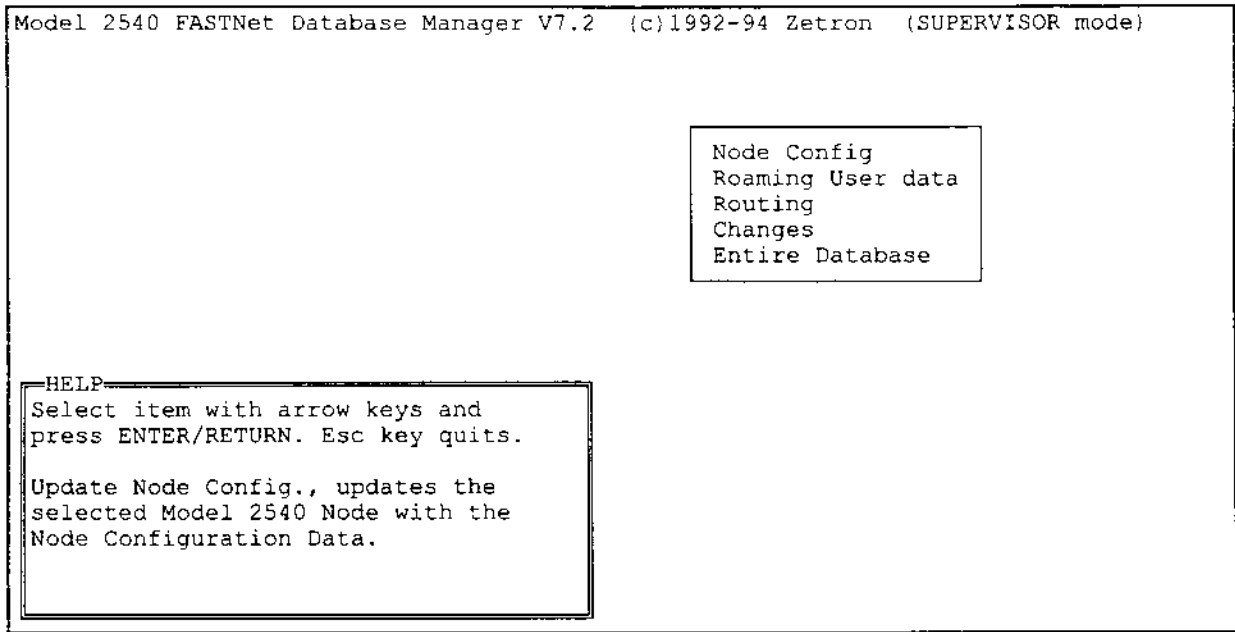


Figure 3-12. Commnet/Update Submenu

If more than one node exists, Fastbase prompts the operator to select the correct node to update. When a node has been selected, Fastbase automatically connects to the Model 2540. Once the connection has been established to the node, Fastbase allows the operator to select other options from the Commnet menu without disconnecting. *If access to a different node is desired*, then the operator must exit Commnet and re-access again from the main menu.

In the Commnet / Update menu, the Node Config function updates the Node config and the radio Sites data from the editNet menu.

Commnet / Update / node User updates the editNet / node Users, General COS, Toll COS, and Roam COS menus.

Commnet / Update / Routing updates the editNet / Dialing plan, Least cost route, and Outdial Table menus.

If this is the first time updating the site, select Commnet / Update / Entire Database. Later, when only a few parameters are being updated, it is faster to use Commnet / Update / Changes function.

Depending upon the menu selection, part or all of the database is compiled into the format that the Model 2540 is expecting. Fastbase does this compilation before establishing the

Section 3. Fastbase Overview

communication link with the Model 2540, unless the communication is already established. This is an attempt to minimize the length of the phone call to complete the update. Before Fastbase compiles the node user part of the database, it runs an integrity check on the data first. If this integrity check fails, an error message states which user record had the problem. Every site that a user can roam to MUST have overdial digits for that site entered in the user record. If overdial digits are missing, this error is flagged. The voice prompt phone number defined in the Node Configuration CANNOT be used as a phone number in the Node Users menu item. This error is also be flagged. Once all these errors are corrected, the integrity check is complete, and the database files are compiled and sent to the Model 2540.

If some type of a communication failure occurs while files are being sent to the Model 2540, Fastbase does not remove the file(s) it was in the process of sending. The Status window displays the status messages from the Model 2540. This shows where in the update process the failure occurred. After a communication failure occurs, selecting Commnet / Update / Changes restarts the process from the point at which the failure occurred.

Verifying FASTNet Programming

The Commnet / get/Verify function determines if there are differences between the databases stored in the office computer and the FASTNet Switch. It also provides the ability to retrieve and store the entire database, or all of the database except user data. When checking user data, Fastbase reports differences if a user has changed their default settings.

Retrieve FASTNet Billing Data

The Commnet / Retrieve menu selection allows the system operator to retrieve detailed billing data from a selected Model 2540 FASTNet node. For more details on billing and billing retrieval, refer to Section 6.

Monitor Model 2540

The traffic monitor feature of the Model 2540 displays the trunk activity of the switch on the computer monitor screen. This is *not* equivalent to the optional "NetView" system traffic monitor software, which is an optional package for the FASTNet System (see "Netview (Optional)" on page 3-18).

Select menu items Commnet / Monitor, Fastbase connects to the Model 2540, and displays a screen similar to that shown in Figure 3-13.

If a printed copy of the display is desired, use the <PrtScrn> key on the office computer. Make sure that the printer is attached to parallel port LPT1: , with the printer on-line and ready for printing.

Section 3. Fastbase Overview

```

Model 2540 FASTNet Database Manager V7.2   (c)1992-94   Zetron

+ 10:02:09a LINK CONNECT 2400 Baud Modem for port 1
+ 10:02:11a Call complete      321-1394   #321-9527 duration 00:01:14
10:02:11a Default ans done    321-1394   5BL      1AL      m49cmds      V 75
+ 10:02:11a access free not enabled
+ 10:02:11a console logged on
+ 10:02:32a Inbound Node call  321-1284 from Node 6
10:02:32a Default Iforward    100-0020      8BL      '321-1284'
+ 10:02:33a Inbound call for   321-1284                      on site 13
10:02:39a Default ans done    100-0020      8AL      L      nodecmds      V 3
+ 10:02:41a Netlink - session over; recv = 2 Xmit = 7
+ 10:02:41a LINK DISCONNECT for port 1
+ 10:02:41a console disconnected
+ 10:02:42a External call      321-1394   #777-2946          from site 13
+ 10:04:16a Call complete      777-4031   #777-5141 duration 00:00:27
10:04:16a Default ans done    777-4031   5AL      1BL      m49cmds      V 28
+ 10:04:30a LINK CONNECT 2400 Baud Modem for port 1
+ 10:04:35a access free not enabled
+ 10:04:35a console logged on
+ 10:04:35a Call complete      321-1394   #777-2946 duration 00:01:50
10:04:35a Default ans done    321-1394   6BL      1AL      m49cmds      V109
+ 10:04:49a Inbound Node call  777-4031 from Node 6
10:04:49a Default Iforward    100-0020      8AL      '777-4031'
+ 10:04:51a Inbound call for   777-4031                      on site 13

```

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Column (a): General Call Status Indicator			{+} Call Initiation Activities or on-going trunk activity. {-} Error Conditions. { } Call Disconnects. {., {-}, {!}, {?}				These prompts indicate information displayed for evaluation by Zetron engineering personnel only.
Column (b): Time of occurrence for specified activity.							
Column (c): Description of activity		{Inbound ...}					Outside-FASTNet to Mobile call.
		{Inbound Node Call}					Other FASTNet Node calling to here.
		{Default ans done}					"done" = end of "Inbound" call.
		{LINK CONNECT 2400 Baud Modem for port 1}					Modem call attempt into FASTNet.
		{access free not enabled}					Password was required for access.
		{console logged on}					Local or Modem terminal access granted (following password, or not)
		{console disconnected}					Local/Modem terminal access ended.
		{External call}					FASTNet mobile to 'outside' call.
		{Default Iforward}					Internal FASTNet call forwarding to Voice Messaging or other trunk.
		{Default Eforward}					External Forward of FASTNet call through telco CO switch (e.g. Voice Message forwarded home; "No Answer Transfer" operations)
Column (d): Node ID code involved with specified activity. (This is the Node Users ID for interconnect calls.)							
Column (e): Inbound FASTNet trunk in use for specified activity.							
Column (f): Outbound FASTNet trunk in use for specified activity.							
Column (g): Script file which was executed during specified activity.							
Column (h): Elapsed time duration of the specified activity.							

Figure 3-13. Typical Commnet/Monitor Screen

Figure 3-13 provides a snapshot of typical real-time trunk activities. It should be noted, however, that there are *many* more possible message codes which may be displayed. We will not attempt to list all of the possible messages and codes within this limited text. A brief general description of these messages is included in Figure 3-13.

Section 3. Fastbase Overview

Any “error” or other messages that arise and require explanation can be handled via telephone contact with Zetron technical assistance personnel.

Netview (Optional)

Netview is a software option that illustrates call routing through the Model 2540 FASTNet Switch. Netview provides an on-screen display of the system and resource utilization in real time, with the source and destination telephone (or ID) numbers. A typical Netview screen is shown in Figure 3-14.

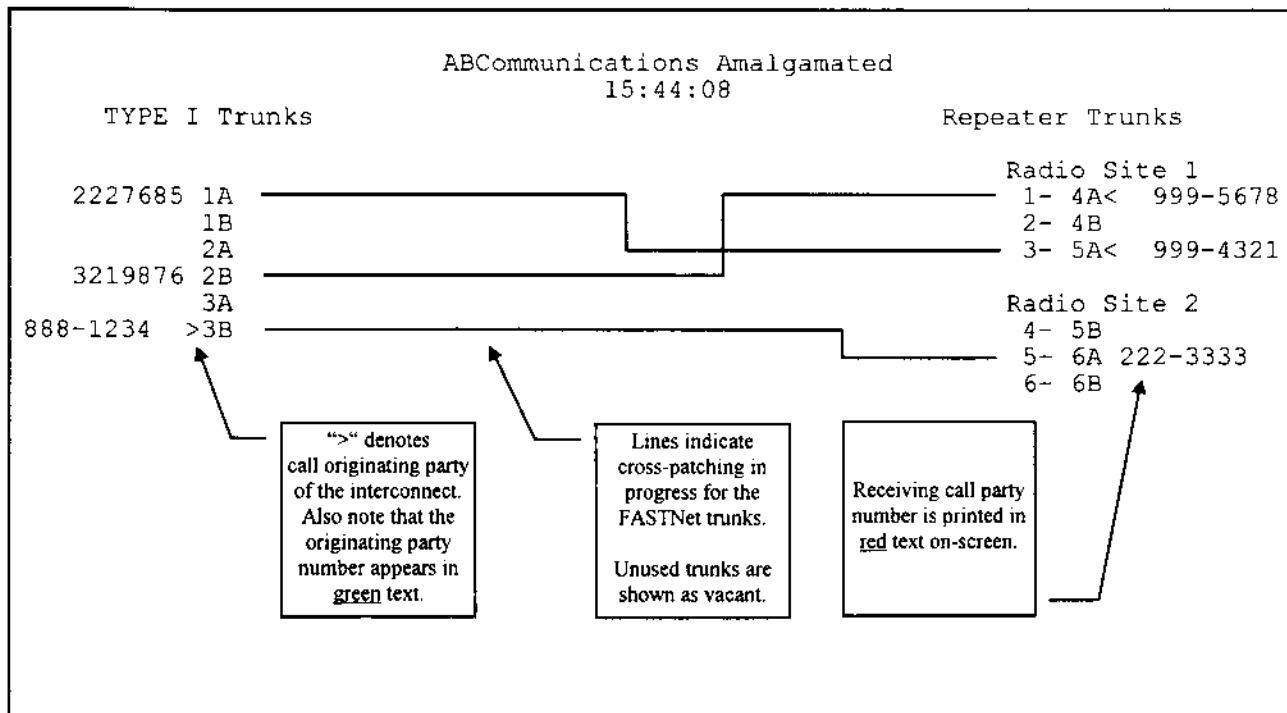


Figure 3-14. Typical Netview Screen

If the Netview option has been purchased, then it may be invoked by selecting Commnet / Netview. This option can be purchased as a field-upgrade and installed by Zetron via modem at any time. The Fastbase software informs the operator “option not installed” if this option is not available.

Setting Up NetView Screen

If the program does not appear to boot, and does not return the “option not installed” message, then the template screen may not be prepared yet. In this case, the NetView screen flashes briefly, and then the Fastbase menu screen reappears. To resolve this condition, the NetView screen *template* file must be prepared. Any text file editor may be used to create or modify the NetView Template file: “CALL_MON.TMP”. This file must be stored in the Fastbase program directory of the computer (default = C:\FASTBASE).



Caution:

Since the NetView “template” file (“CALL_MON.TMP”) shares the same file extension as DOS “temporary” files, certain precautions should be observed:

1. Save a copy of the finished file using another extension (e.g. CALL_MON.BAK, etc.)
2. DO NOT execute a DEL *.TMP command from DOS in the FASTBASE directory, unless the file is previously ‘backed-up’ as described above.
3. After deleting *.TMP files, rename a copy of the backup CALL_MON file to have the .TMP extension so that NetView can find the file for execution.

A sample NetView template screen is shown in Figure 3-15. Notes have been superimposed onto this view detailing the rules for file construction, which are also listed below:

1. The NetView screen is a “text” field, 25 lines high by 80 characters wide.
2. Text comments may be typed anywhere on-screen, using upper- or lowercase type.
3. A FASTNet clock may be displayed on-screen. This is inserted by placing “<clock>” at the desired location. Also note that the default clock is 24-hour based, but may be changed via the TCE program to 12-hour basis. This is the same clock used throughout the FASTNet programming.
4. Trunks are located on the screen by placing “<nnA>” or “<nnB>” on the screen, where nn = the dual trunk card address, and (A,B) denote the trunk circuit desired. Additionally, these address specifications should be arranged into two columns, one on each side of the screen. An unused region exists between each column and on the outside edges of the screen. These two regions identify the user ID code or dialed digits encountered at each trunk during an interconnect call. These two outside regions must be a minimum of 10 digits wide, up to a maximum of 20 digits wide.
5. Notes for the trunk addresses of item 4 should be typed adjacent to each address along the center region of the screen, as desired.

NetView automatically senses the leftmost character of the right-column trunk address strings (i.e. the “1” of “16-<8B>”). Netview then moves two characters left, and establishes the right side of the center ‘graphics’ zone. NetView does the reverse to establish the *left* side of the center ‘graphics’ zone.

Zetron does *NOT* recommend inserting any comments or other text into the center ‘graphics’ region of the NetView screen. Any such labeling is rendered useless and unreadable by the NetView graphics.

Please direct any further inquiries to Zetron technical support.

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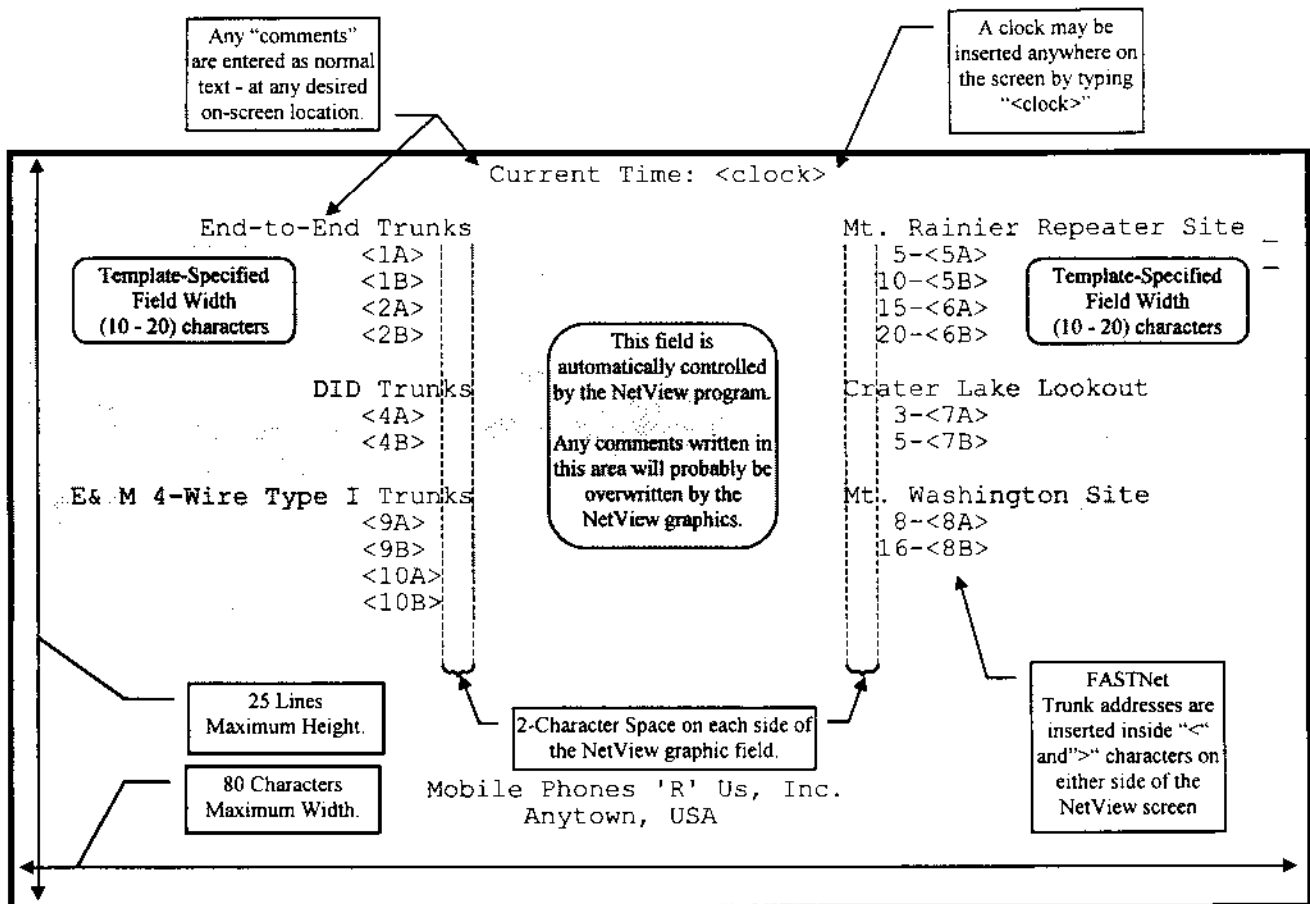


Figure 3-15. NetView Screen Setup

Fastbase 'Other' Functions

The Commnet / Other menu selection pops up a submenu as shown in Figure 3-16.

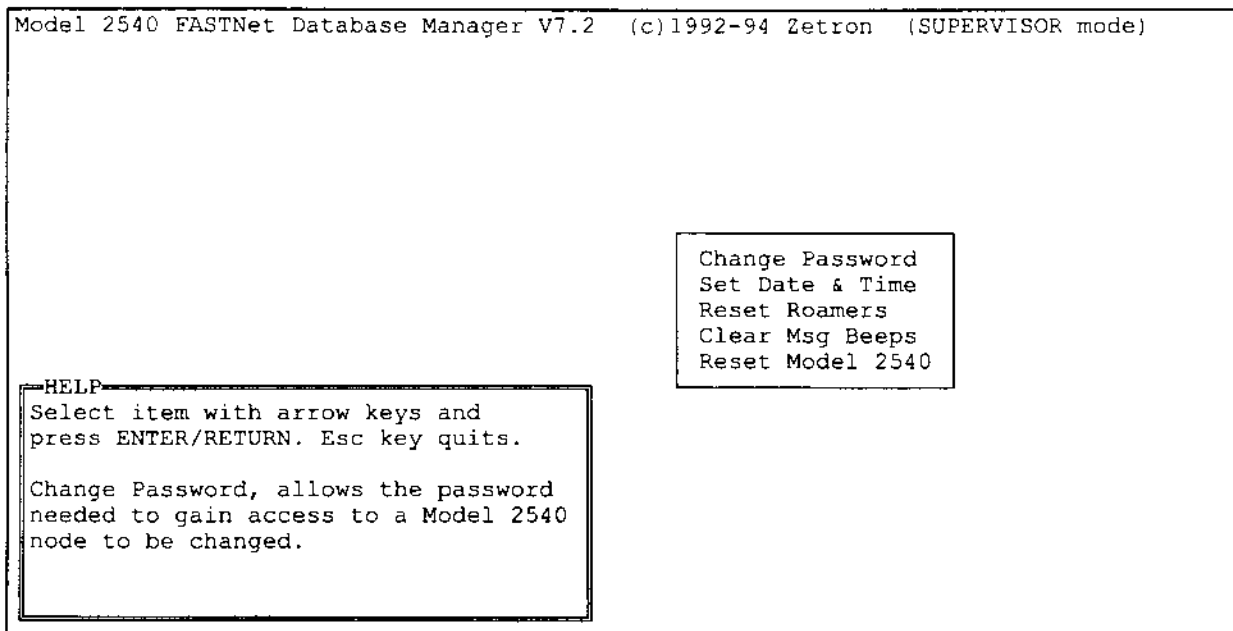


Figure 3-16. Commnet / Other Submenu

The Commnet / Other menu contains the following choices:

- Change Password* This selection allows modification of the Password in the Model 2540. When a new password is selected, both the Model 2540's password and Fastbase's password are changed. Use the otHer menu to change only the Fastbase password; see "Other Fastbase Functions" on page 3-24. The Model 2540 ignores or verifies passwords depending upon the setting of DIP switch C1 on the face plate of the 2540 FASTNet CPU. Position A is ignore passwords, position B is require / verify passwords.
- Set Date & Time* This selection allows the date and time to be changed on the Model 2540. It is important to set the date and time once the FASTNet Switch is installed, in order to insure that Call Detail records and mail messages have the proper time stamp. When this item is selected, the status window shows the current time on the Model 2540. The window shows the appropriate format for the date and time. When a new date and time are entered, a command is immediately issued to the FASTNet Switch and the updated date and time are displayed. Hit <Esc> at any time to save and exit.

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- Reset Roamers* This selection allows the operator to set all roamers at a specific site back to their home site. When a user roams to a new area and registers, a message is sent to the Model 49/459 at the roamer's home site that the roamer is out of the area. The Model 49/459 marks this user as being out of the area. Selecting Reset Roamers for this site tells the Model 2540 to queue up a message to send to the Model 49/459 site to reset all the roamers for that site. From that point on both the Model 49/459(s) at that site and the Model 2540 believe all the roamers are back in the home area. When Reset Roamers is selected, a Radio Site window appears. Move the cursor to the desired site, press <Enter>. The "Reset Roamers on selected Site (y/n)?" field appears.
- Clear Msg Beeps* This selection allows the operator to turn off all pending message beeps for a selected Radio Site. When Clr Message Beeps is selected, a radio site window appears. Move the cursor to the desired site, and press <Enter>. The "Clear Msg Beeps on this Site (y/n)?" field appears. Answer 'Y' to turn off all message beeps.
- Reset Model 2540* This selection allows the operator to remotely reboot the FASTNet Switch. When Reset Model 2540 is selected, the system prompts for confirmation: "Reset Model 2540 (y/n)?" Answer 'Y' to reboot the FASTNet switch. The status window shows the command being initiated and a good-bye message from the Model 2540 as it is executing the reset. The reset disconnects the computer interface to FASTNet.

Printing

From the main menu, select PrintNet to print the Fastbase parameters (Node, Radio Site, Node User, General COS, Toll COS Table, Roam COS Table, Dialing Plan, Least Cost Route or Outdial Table). Database information stored in the computer files is output to a printer attached to the computer.

The printed output can go directly to the printer (PRN), or into a disk file. The printout may be sorted by any data field that appears on the index screen. For example, the Model 2540 Node user information may be sorted by Phone #, Name, or Account number. Fastbase presents choices for sorting, after the desired print function is selected.

Fastbase uses the device "PRN" to specify the printer from DOS. This is typically defaulted to "LPT1:" in DOS, but may be re-assigned by the programmer through DOS commands.

Data Backup / Restore

It is very important to periodically save an extra copy of the subscriber database. Should the hard disk fail, a Fastbase file get accidentally deleted, or some other disaster occur, a recent copy of the database is essential for fast system recovery. Zetron recommends back-ups be performed daily, or at least whenever system users and/or parameters are updated.

Every time editNet is used to modify the database, the files named “*.DAT” change on the computer hard disk. Without current back-up files and/or a “paper trail” documenting the latest changes to the FASTNet database, recovery from any type of system failure could be very expensive and time consuming. Reloading the database from back-up diskettes following a catastrophe is inexpensive and relatively fast.

Before beginning a backup, prepare fresh diskettes with DOS compatible formatting information. Approximately one 360KB diskette is required for every 1000 user IDs. Be sure to format enough blank diskettes (FORMAT A: from the DOS C> prompt) before starting the backup process. The Config. data, SMDR call detail, and SMDR Roaming call detail must be stored on separate diskettes.

It is also a good idea to put labels with the date and disk sequence number (FASTBASE BACKUP - today's date - disk #n) on the diskettes. As each backup diskette is removed from the computer, “write protect” the diskette (by covering the notch with a black label on 5¼-inch media; or by opening the shutter on 3½-inch media).

To back up the current database, select Backup / Config data from the main menu, as shown in Figure 3-17. Fastbase provides precise instructions regarding when to insert the formatted floppy diskettes into the computer. Keep more than one set of backups and rotate them through usage. For example, separate sets of diskettes for the odd and even days of the month would provide redundancy in case the system fails and one set of backups fail - the second set of backups would be available to restore the system to operation.

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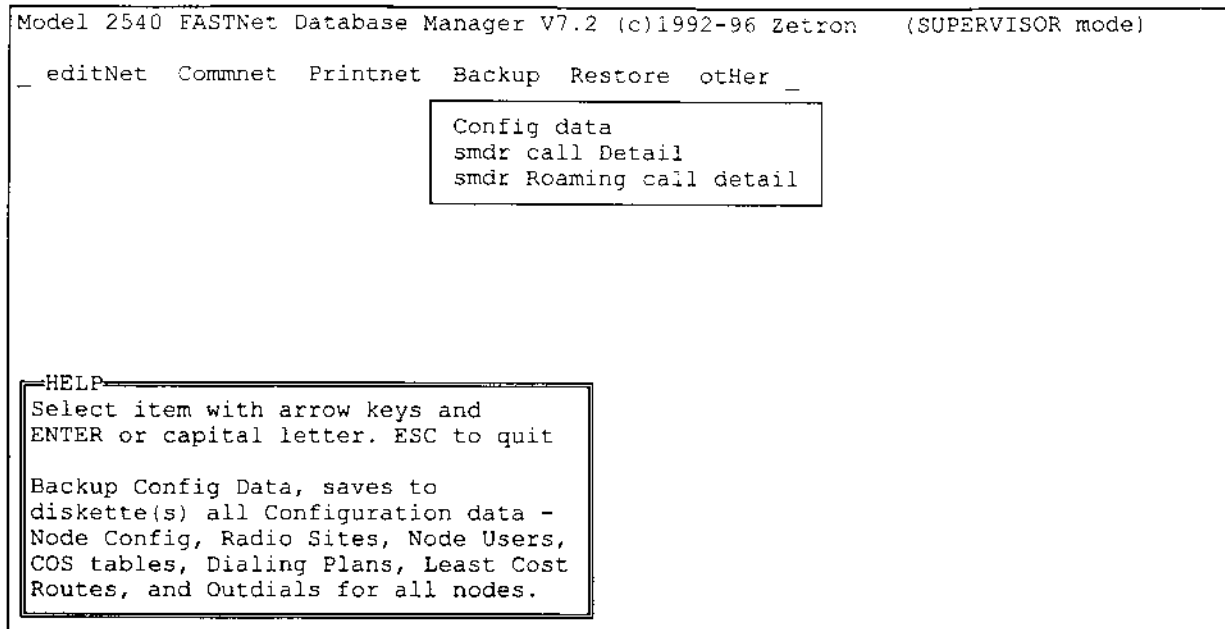


Figure 3-17. Fastbase Backup Menu

If you need to restore the database from backup diskettes onto the computer hard disk, select Restore / Config data from the menu. The backup and restore menus look the same. Fastbase gives precise instructions about when to insert the backup diskettes into the computer. Make sure to insert the correct set of backups (if you have more than one set), and in the correct order. Before you insert each backup diskette into the computer, it is a good idea to “write protect” the diskette (black label covering the notch on 5¼-inch media; shutter open on 3½-inch media).



Note:

Fastbase will *not* restore data from a backup made by a *different version* of Fastbase.

Other Fastbase Functions

The menu item labeled *otHer* provides a submenu as shown in Figure 3-18.

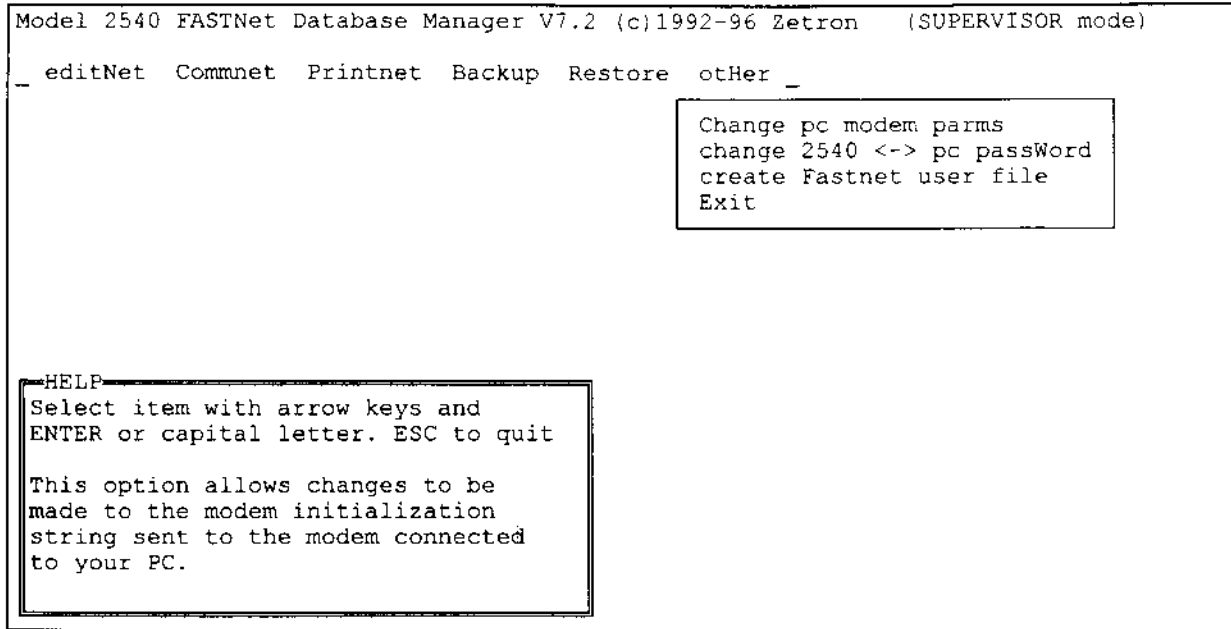


Figure 3-18. Fastbase otHer Menu

Change pc modem parms

The first item, Change pc modem parms, changes the initialization information sent by the office computer to the serial port modem. This is sometimes necessary since not all brands of modem are truly "Hayes-compatible".

FASTNet communications looks here, configures the modem, and then proceeds to dial via *normal* modem protocol to the FASTNet Switch.

The default modem initialization string is "AT E1 Q0 X2".

Change Fastbase Password

The otHer menu is also used to change the password used by Fastbase to access the Model 2540s ("change 2540 <-> pc passWord"). This provides extra protection against unauthorized computer access to FASTNet nodes. This selection only changes the password in Fastbase and not in the units. To change the password in the units, use Commnet / Other / Change Password.

Create FASTNet User Files for ZEBRA Billing

The ZEBRA billing package requires a "User File" which associates billing information with each user number. These files are automatically created when billing information is retrieved from the units.

Sometimes it is necessary to create these files without actually retrieving billing data. Select create Fastnet user file to generate the specified user file for the Model 2540 node.

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Exiting Fastbase Operation

Exit from Fastbase to DOS by using the <Esc> key, one level at a time, or by selecting other / Exit.

USER PASSWORD PROTECTION

Fastbase provides an advanced security feature to prevent unauthorized access to the database information. Greater password protection may be desirable if the office computer resides in a high-traffic area available to unauthorized persons.

The password feature is accessed by pressing <Shift> + <F9> from the main menu. Figure 3-19 shows the user password screen layout. This screen is also subject to password security.

Model 2540 FASTNet Database Manager V7.2 (c)1992-96 Zetron (SUPERVISOR mode)

HELP

Enter a level-number if you wish to change the corresponding password.
Enter escape or return to exit.

- 1 Edit all except users.
- 2 Edit Users.
- 3 Accounting, call accum., etc.
- 4 Supervisor: Full access.

Passwords

Level	Password
1.	*
2.	*
3.	*
4.	*

Enter the number of the level
you wish to change: _

Figure 3-19. Fastbase Password Window

When Fastbase is first installed, the system defaults to full user-access. This is noted in the upper right corner of the Fastbase screen as "SUPERVISOR mode". The message is displayed to warn the system operator that anyone has full access to the database. Anyone who knows the <Shift> + <F9> sequence can change the password and lock authorized personnel out of the system. If this happens, follow the procedure in "Restoring Passwords" on page 3-30.

Fastbase remains in the supervisor mode until the <Shift> + <F9> sequence is pressed, passwords are altered, and Fastbase is restarted.

Fastbase has four distinct levels of security. Each level is assigned a unique password (if desired). System operators access the appropriate level of security with the assigned password for that level.

Levels of Security

Fastbase has four security levels and one low-level, restricted access mode that requires no password. The levels are numbered, but the numbers do not reflect increasing levels of access. The capabilities of each level are as follows:

After *first installing* Fastbase, the program *defaults* to full user access, which is noted in the upper right of Fastbase's screen as "SUPERVISOR" mode. Fastbase remains in this mode until a <Shift> + <F9> is performed to change passwords and the program is restarted. This message warns the user that he/she has complete access to all database operations. At this point, anyone who knows the <Shift> + <F9> procedure can change the password and possibly lock others out of the system (If this happens, with Fastbase running, call Zetron and an engineer will help restore password access; this procedure is outlined in "Restoring Passwords" on page 3-30.

Security Level 0

The user can access the Commnet menu to monitor and netview. No other access is allowed. A password is not needed for this level.

Security Level 1

The user can access the Site configuration, change PC modem parameters, clear alarms and change the modem string. The user can also access Node and Radio Sites. The user can update and verify data. Level 1 users can change their own password.

Security Level 2

The user can access least cost routing and other configuration menu items. The user can also perform backups and restores. The user can update and verify data. Level 2 users can change their own password.

Security Level 3

The user can perform accounting operations - retrieve SMDR files from the FASTNet Switch and generate .U00 user files for each site. The user can also perform backups and restores. Level 3 users can change their own password.

Security Level 4

The user with level 4 security can access everything.

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Setting the Passwords

To get to the password entry screen, press <Shift> + <F9> from the main menu. The password screen is *only* available from the main menu.

Passwords must be one to eight ASCII characters long. They are case sensitive, and no spaces are allowed within a password. Bad characters are automatically filtered out during entry. The character string "HELP" is not an acceptable password.

Enter a password for each security level that is password protected.

After typing in a password, press <Enter> to make it valid. To cancel an entry, press <Esc>. You must exit and restart Fastbase to make the password changes take effect.

Unlimited Access Password

To allow unlimited access to a security level, enter a single star "*" for the password. That level becomes accessible to all users.



Caution:

Never set passwords for security levels 0-3 and then enter a * for level 4. If passwords are programmed this way, the passwords are ignored and all users are granted level 4 access.

Certain menu items are accessible from more than one security level. If a password exists for one level of a shared menu item and * is the password for another level of the same menu item, access is denied for users at the star's level.

If two levels of security are assigned the same password (not *), any user with that password can access both levels.



Note:

The character string "**" is a valid password and is not interpreted the same as a single star "*".**

Using Passwords

When Fastbase is restarted, the same main menu screen appears. If the user attempts to access a protected menu item, Fastbase prompts for the password. If an incorrect password is entered, the user can reenter a password by selecting the menu item again. When the password is entered correctly, the menu selection is accessed and the user gains new security privileges.

Users can migrate between access levels, but a level 4 user cannot change levels without exiting and restarting Fastbase. In addition, once level 0 access is upgraded, it cannot be reentered without exiting Fastbase. Figure 3-20 illustrates the movement between the five security access levels.

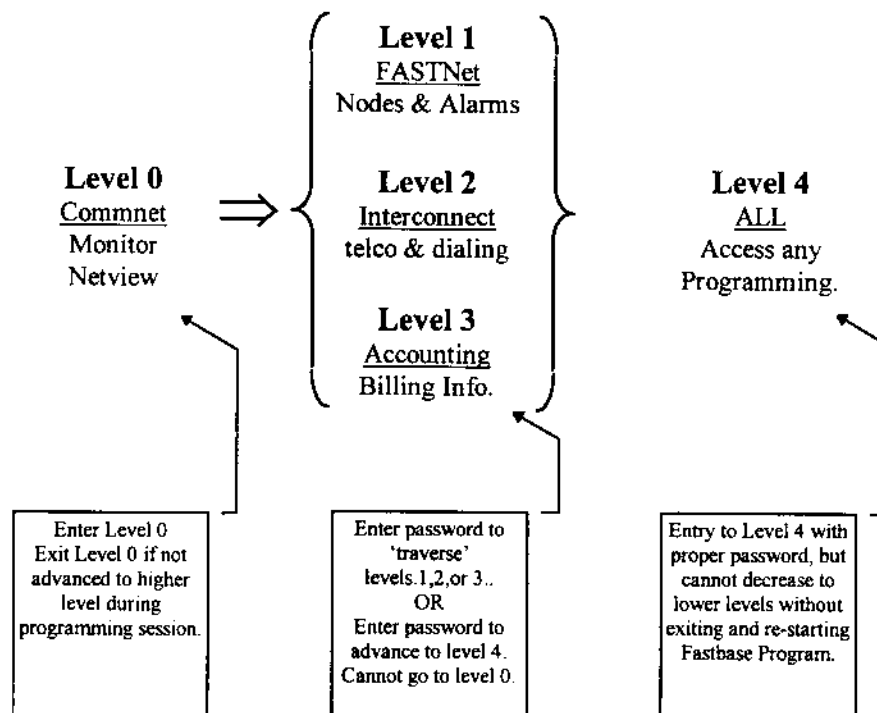


Figure 3-20. Password Level Hierarchy for Access Codes Only



Caution:

Users should always quit Fastbase after they are done changing any passwords to prevent unauthorized access.

Changing Passwords for Security Levels 1, 2, and 3

The user can change the password for their level of security if the current level is 1, 2, or 3. Pressing <Shift> + <F9> from the main menu allows the user to change their password. Once again, "HELP" is an invalid password. In addition, if a "*" is entered, the current password is cleared and anyone can access that level of security.

Restoring Passwords

Fastbase provides an emergency method of restoring passwords in the event that they are forgotten or the system locks up.



Caution:

The password restoring procedure grants full security access. Only authorized personnel should have access to this procedure.

If Fastbase denies any access, enter "HELP" as a password. A five-digit number appears on the screen as shown in Figure 3-21. (This number changes each time "HELP" is entered.)

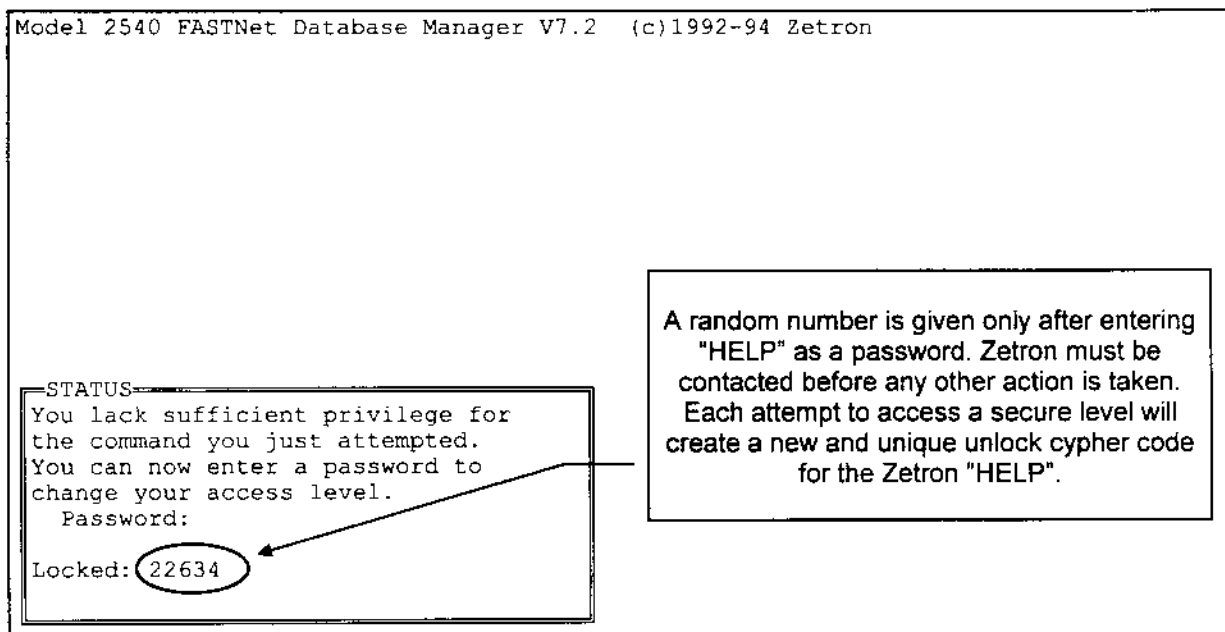


Figure 3-21. "HELP" Password Status Window

Call Zetron for assistance. An applications engineer will ask for the number that appeared on your screen, so have it handy when you call. Once you have entered the access number provided, press the <Shift> + <F9> key sequence to verify that the passwords were restored.

Please write down the passwords and store them in a secure location to avoid accidental disclosure.

If a system user forgets their password, they should get help from the system supervisor, NOT ZETRON.



Caution:

Zetron assumes no liability, express or implied, for misrepresented individuals who may gain access to a given FASTNet Switch. We have no way of validating supervisor's identification via telephone.

Password Access Summary

Table 3-2 details the authorized security access for Fastbase menu functions.



Note:

These access assignments may change as new features are added to Fastbase.

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Table 3-2. Fastbase Menu Security Access

Main Menu:	Sub Menu 1:	Sub Menu 2:	Security Access Level				
			0	1	2	3	4
editNet	Node config			✓			✓
	radio Sites			✓			✓
	node Users				✓		✓
	General cos				✓		✓
	Toll cos table				✓		✓
	Roam cos table				✓		✓
	Dialing plan				✓		✓
	Least cost route				✓		✓
	Outdial table				✓		✓
Commnet	Update	Node Config		✓	✓		✓
		Roaming User data		✓	✓		✓
		Routing		✓	✓		✓
		Changes		✓	✓		✓
		Entire Database		✓	✓		✓
	get/Verify	Node Config		✓	✓		✓
		Roaming User data		✓	✓		✓
		Routing		✓	✓		✓
		All Except Users		✓	✓		✓
		Entire Database		✓	✓		✓
	Retrieve					✓	✓
	Monitor		✓	✓	✓	✓	✓
	Other	Change Password		✓			✓
		Set Date & Time		✓			✓
		Reset Roamers		✓			✓
		Clear Msg Beeps		✓			✓
		Reset Model 2540		✓	✓	✓	✓
	Netview (optional)	(System Traffic Monitor)	✓	✓	✓	✓	✓
Printnet	node Config			✓			✓
	radio Sites			✓			✓
	node Users				✓		✓
	General cos				✓		✓
	Toll cos table				✓		✓
	Roam cos table				✓		✓
	Dialing plan				✓		✓
	Least cost route				✓		✓
	Outdial table				✓		✓

Table 3-2. Fastbase Menu Security Access, Continued

Main Menu:	Sub Menu 1:	Sub Menu 2:	Security Access Level				
			0	1	2	3	4
Backup	Config data		✓	✓	✓		✓
	SMDR call detail		✓	✓	✓		✓
	Roaming SMDR call detail		✓	✓	✓		✓
Restore	Config data						✓
	SMDR call detail						✓
	Roaming SMDR call detail						✓
otHer	Change pc modem parms			✓			✓
	change 2540 <-> pc passWord						✓
	Exit		✓	✓	✓	✓	✓

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4. SETTING UP A DATABASE

FASTBASE PROGRAM OVERVIEW

The Fastbase database consists of several database files that are used to program the Model 2540 FASTNet Switch. This section describes each of the selections from the editNet menu shown in Figure 4-1.

```
Model 2540 FASTNet Database Manager V7.2 (c)1992-96 Zetron

_ editNet  Commnet  Printnet  Backup  Restore  other _

Node config
radio Sites
node Users
General cos
Toll cos table
Roam cos table
Dialing plan
Least cost route
Outdial table

HELP
Select item with arrow keys and
ENTER or capital letter. ESC to quit

EditNet Node Config allows the Node
Configuration data to be viewed and
modified.
```

Figure 4-1. EditNet menu

For the Model 2540 FASTNet Switch, the following database files exist: Node Config, Radio Sites, Node Users, General COS, Toll COS Table, Roam COS Table, Dialing Plan, Least Cost Route, and Outdial Program. Below is a brief description of each database file.

Node Config

The Node Configuration defines parameters that apply to *one* entire Model 2540. These parameters consist of such things as programming access and the method used for communicating with Radio Sites. Once a node has been defined, the rest of the Fastbase files are created under that node.

Radio Sites

The Radio Sites define the Model 49/459 sites that a particular FASTNet node can access. The parameters define the type of connection to the site and the devices interfaced to the site. In a system, this may include sites on other nodes.

Section 4. Setting Up a Database

Node Users

The Node Users define the mobiles that are allowed to access the FASTNet Switch. The Node Users parameters define each user's class of service and how to connect to that user on the Radio Sites.

General Class of Service (COS)

The General Class of Service defines the basic privileges assigned to a user. These privileges include the type of dialing plan, forwarding instructions, call limit timers, and voice message limits.

Toll Class of Service (COS)

The Toll Class of Service defines the restricted and allowed number sequences. Each node user database specifies one toll restrict table from this group.

Roaming Class of Service (COS)

The Roaming Class of Service defines which Radio Sites a user may roam to and still access the system.

Dialing Plan

The Dialing Plan defines the number sequences that FASTNet allows each user to dial. The FASTNet Switch compares the digits received against the available digit strings. FASTNet then evaluates the Least Cost Routing Tables, and finally connects each call through to the destination.

Least Cost Routing Tables

The Least Cost Routing Tables define how the FASTNet Switch decides which trunk an outgoing call should be routed through. The tables are used to route calls in the most cost-effective manner. When programmed appropriately, the LCR tables minimize telco billing, while maximizing FASTNet performance for system users.

Outdial Program

The Outdial Program defines how digits should be dialed out on a particular trunk group. This allows digits to be added or inserted to take advantage of local and foreign exchange trunks.

INITIAL FASTBASE PROGRAMMING

When setting up the FASTNet database for the first time, each section should be programmed in the order listed in Table 4-1.

Section 4. Setting Up a Database

Table 4-1. Initial Database Plan for Fastbase Startup

Database Parameter	Function	Fastbase Menu Path
Node Config	"Node" programmed per M2540 Switch.	editNet / Node config
Outdial Program	Outgoing Calls setup to use these items.	editNet / Outdial table
Least Cost Routing Tables		editNet / Least cost route
Dialing Plans		editNet / Dialing plan
Radio Sites	Each LTR compatible repeater "system" (20 RF channels maximum) is referred to as a "radio site" in the FASTNet realm, and are defined in Fastbase (numbered 1-255).	editNet / radio Sites
Roaming COS	Dialing tables <u>must</u> be configured before they can be selected in any of Node Users' records. Roaming COS Tables (1-255) specify up to 32 FASTNet Site Numbers which may be accessed by each node user, as specified in the Node User data.	editNet / Roam cos table
Toll COS	'Allows' or 'restricts' specific dial strings	editNet / Toll cos table
General COS	Defines Dial Plan per Node User, interconnect privileges, Call Time limits, Voice Message privileges, etc.	editNet / General cos
Node Users	FASTNet User ID codes.	editNet / node Users

Section 4. Setting Up a Database

NODE CONFIGURATION

To begin defining a database for the Model 2540 FASTNet Switch, first create a *node*. A node is defined as one Model 2540 FASTNet Switch and all associated interconnect or repeater trunks, including any optional slave Expand Chassis and their associated trunks (in the case of 40 or 60 trunk systems). The node database contains general information on programming access and FASTNet switch updates to the node.

Programming a New Node

A separate node must be created for each Model 2540. Follow the steps below to configure a node:

- 1) Select editNet, Node config from the Fastbase main menu, and press the <Enter> key. The blinking cursor appears in the Index window.
- 2) Press the <Enter> key again and the cursor moves to the Node Config window on the right side of the screen, shown in Figure 4-2.
- 3) Type in a number for the new node and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

```
NODE_CONFIG
Node Number: [001]
Node Name:[TEST NODE SETUP      ]

Node Access:L ...  PC Comm Port:1

Direct Connect To Other Nodes: N ...
Dial Connect To Other Nodes: N ...

Batch Interval (sites): 0001 minutes
Batch Interval (nodes): 0001 minutes

Pop-Up System Voice Prompt Window:Y..

Create Date: 02/27/95
Alter Date: 03/06/95
```

Figure 4-2. Node Configuration Window

The Node Configuration window contains the following fields:

Node Number

The Node Number uniquely identifies the node. This number is used to create the corresponding Radio Site, Node User, Class of Service and dialing plans for each node.

The Node Number should be a three-digit number between 000 and 255. There is no default setting for this field.

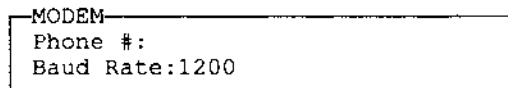
Node Name

This field assigns the name of the node. This field is not required, but intended for personal use as a 'label' by the system programmer. This field label resides in the Fastbase programming and is *not* stored into the FASTNet database. The Node Name may, however, be used for sorting records for printout etc. Database retrieval from FASTNet fills this field with the label "VERIFIED NODE xxx" (xxx = Node Number).

The Node Name should be a character string, up to 40 characters in length. There is no default setting for this field.

Node Access

This field indicates the programming access method for PC communication with the node. Depending on the data entry, a pop-up window similar to that shown in Figure 4-3 prompts for the node phone number and baud rate.



MODEM
Phone #:
Baud Rate:1200

Figure 4-3. Modem Access Window

The following entries are valid for the Node Access field:

M	Modem connection
L	Local RS-232 serial connection

The default setting for the Node Access field is L.

PC Comm Port

The PC Communication Port field determines which PC COM Port is used to communicate with the FASTNet Switch.

Enter the COM Port as a number between 1 and 4. The default setting is COM port 1.

Section 4. Setting Up a Database

Direct Connect To Other Nodes

This field enables direct (E&M) connections to other nodes for Roaming status information. When a Y is entered, the window shown in Figure 4-4 appears.

DIRECT			
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:
Node:	Trunk:	Node:	Trunk:

Figure 4-4. Direct Node Connection Window

The Direct window contains the following fields:

Node Enter the node number to connect to as a 3-digit number between 001 and 255. This includes direct interfaces via RF or μ wave links between nodes.

Trunk Enter the trunk group used to call the identified node.

Y (es) and N (o) are the only available entries for the Direct Connect field. The default setting is N.

Dial Connect To Other Nodes

This field enables dialup connection to other nodes for node-to-node Roaming. When a Y is entered, a window similar to that shown in Figure 4-5 appears.

DIAL	
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:
Node:	Phone No.:

Figure 4-5. Dial Connection Window

The Dial window contains the following fields:

<i>Node</i>	Enter the node number to connect to as a 3-digit number between 001 and 255.
<i>Phone #</i>	Enter the phone number used to access the designated node. These numbers must be in the dial plan of General COS 255.

Y (es) and N (o) are the only entries available for the Dial Connect field. The default setting is N.



Note:

Unless purchased as an upgrade option, the maximum number of direct node or dial connections is 4.

Batch Interval (sites)

The Site Batch Interval determines the time (in minutes) between Node User roaming information updates to the sites (which are controlled by this node). Updates are also performed when a connection is made for a call.

Enter the Batch Interval as a number between 1 and 255. The default setting is 1 minute.

Batch Interval (nodes)

The Node Batch Interval determines the time (in minutes) between Node User roaming information updates to other nodes. Updates are also performed when a connection is made for a call.

Enter the Batch Interval as a number between 1 and 255. The default setting is 1 minute.

Pop-Up System Voice Prompt Window

This field allows access to the window shown in Figure 4-6.

VOICE_PROMPT

Phone Number:
Security Code:
Voice Limit: 001

Figure 4-6. Voice Prompt Window

Section 4. Setting Up a Database

The Voice Prompt window contains the following fields:

<i>Phone Number</i>	Enter the phone number used to access the FASTNet Switch for voice prompt programming.
<i>Security Code</i>	Enter a four-digit number used to access programming mode once connected to the node.
<i>Voice Limit</i>	Enter the voice prompt time limit (in seconds) as a number between 1 and 131. The default setting is 1 second.

Create Date

This field automatically records the date on which the record was created. This date can be changed for alternate use if so desired.

Enter the date in the format MM/DD/YY. The default setting is the actual creation date.

Alter Date

This field automatically records the date on which the record was last edited. This date can be changed for alternate use if so desired.

Enter the date in the format MM/DD/YY. The default setting is the current date (when a record is "touched").

OUTDIAL TABLE

The Outdial Table contains up to 99 programs (numbered 1-99) that define dialing on each trunk group in the Model 2540. Outdial programs are setup by generating a list of commands that indicate the exact dialing sequence. These programs allow the system to take advantage of special line types and/or restrictions.

Programming a New Outdial Table

Follow the steps below to create an Outdial Table:

- 1) From the Fastbase main menu, select editNet / Outdial table and press the <Enter> key. The blinking cursor appears in the Index window (see Figure 4-7).
- 2) Press the <Enter> key again and the cursor moves to the Outdial Table window on the right side of the screen.
- 3) Begin typing in a number for the new Outdial table and Fastbase creates a new data record filled with default values.

Section 4. Setting Up a Database

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)

INDEX

NO	Program Name
----	--------------

NODE 001

OUTDIAL PROGRAM

Program Number: [01]

Program Name: [TEST OUTDIAL PROG 1]

Command	Parameters
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

HELP

Hit ENTER/RETURN to view selections.

ECHO Outdial a particular field.

ECHOALL Outdial remaining fields.

DIAL Outdial given Digits.

PAUSE Wait before continuing.

DETECT Wait for dialtone.

DTMF, MF, PULSE Outdial format.

END Terminates outdial program.

Figure 4-7. Fastbase / Outdial Table

Setting Up an Outdial Table

Generally, to create an Outdial Program in Fastbase, select editNet / Outdial table. Select an existing program number from the index, if some already exist, and press <Enter> to access the Data Screen.

Type in a new Program Number (see Figure 4-8, Note 1) and press <Enter> to start a *new* data record. Alternately, press <Enter> without a new number to edit the existing program.

Section 4. Setting Up a Database

The screenshot shows a terminal window titled 'NODE 001' with the following text:

```
OUTDIAL PROGRAM
Program Number: [  ]
Program Name: [      ]

Command      Parameters
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
```

Annotations with arrows pointing to the screen:

- 1. Enter the desired program number here. (1-99)
- 2. Enter a descriptive name.
- 3. The Command field is filled by Fastbase - press \downarrow and a pop-up window appears with a list of commands. use \uparrow and \downarrow keys to select command, then press \downarrow to insert that command.
- 4. Enter applicable parameters for each command, if used. Spaces separate variable fields, NO hyphens accepted. NO spaces in DIAL strings.
- 5. Maximum 12 lines per Outdial Program.

Figure 4-8. New Outdial Program Screen

The Outdial Program window contains the following fields:

Program Number

The Program Number uniquely identifies the outdial program.

Enter a number between 1 and 99. There is no default setting for this field.

Program Name

The Program Name (see Figure 4-8, Note 2) should be descriptive for the dialing function it identifies. It is helpful to include standard telco labels such as 'LOCAL', 'DTMF', 'MF', and 'FX' in the program name for identification purposes. Please note that this name only exists in the original Fastbase files. Any "retrieved" files from the FASTNet Switch would be default labeled as "VERIFIED OUTDIAL".

Enter a text string up to 20 characters in length. There is no default setting for this field.

Outdial Commands

The following commands are available when programming the Outdial table.

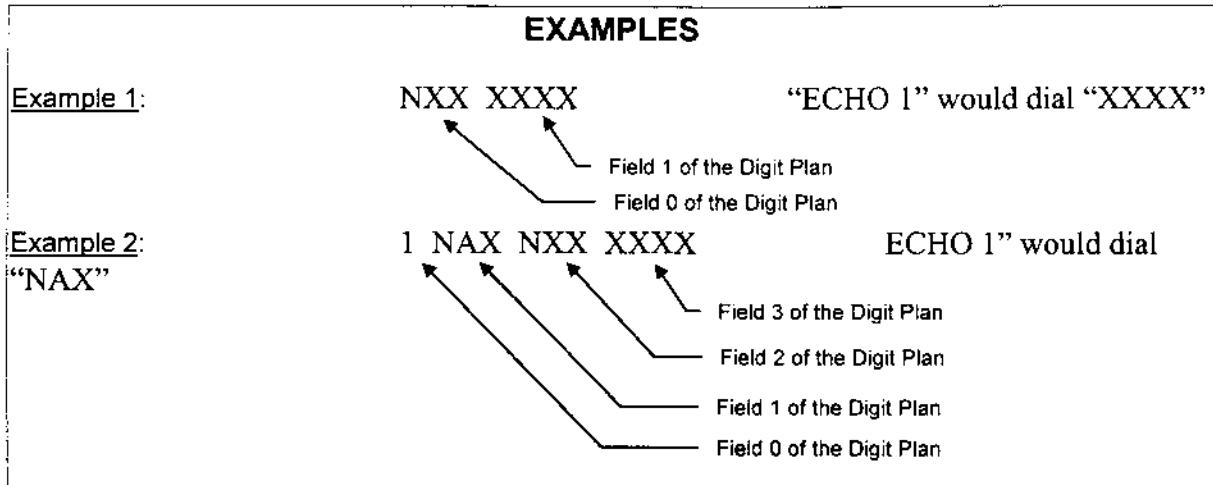
ECHO

The Echo command tells the FASTNet Switch to outdial a field from the digit plan. Each dialing plan starts with field 0.



Note:

The "digit plan" is programmed as part of the "Dialing Plan" Data Screen.



Note:

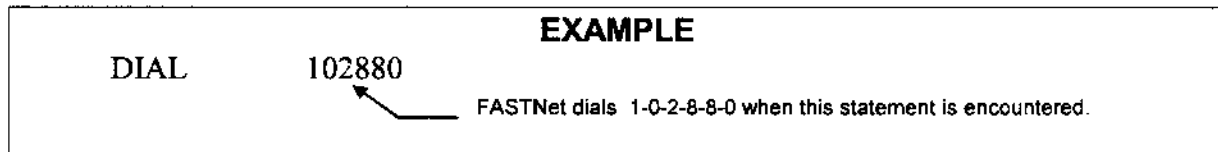
1. Digit Fields are separated by spaces. Hyphen characters "-" are not accepted.
2. Digit Plan letter variables used in this example are explained in detail in "Dialing Plan" on page 4-15.

ECHOALL

The Echoall command tells the FASTNet Switch to outdial all the remaining digit fields in the digit pattern. There are no parameters for this field.

DIAL

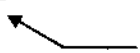
The Dial command tells the FASTNet Switch to dial out up to 8 digits specified in the parameter field.



Section 4. Setting Up a Database


PAUSE

The Pause command tells the FASTNet Switch to stop dialing and pause for the programmed period intervals. Enter the pause as a number between 1 and 9 (seconds).

EXAMPLE	
PAUSE	1
	
	FASTNet halts dialing for 1 second when this statement is encountered.

DETECT

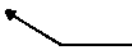
Wait up to N second time intervals for dialtone to be detected. Enter the interval as a number between 1 and 9. The default setting is 5 seconds.

EXAMPLE	
DETECT	3
	
	FASTNet looks for Dial Tone for 3 seconds when this statement is encountered.

DTMF

Dial out using Dual Tone Multi Frequency signaling. The following parameters are available:

0, 1	10 digits per second
2	5 digits per second
3	11 digits per second
4	12 digits per second
5	13 digits per second
6	14 digits per second
7	15 digits per second

EXAMPLE	
DTMF	7
	
	FASTNet dials DTMF tones at the rate of 15 digits/second when this statement is encountered.

MF

The MF command tells the FASTNet Switch to dial out using multifrequency signaling.

PULSE

The Pulse command tells the FASTNet Switch to dial out using dial pulse (click) signaling.

END

The End command tells the FASTNet Switch that the program is complete. This should be the last command of *every* program.

Entering New Commands

To enter a command in the program, select a command field (see Figure 4-8, Note 3) using the ↑ and ↓ keys and press <Enter>. This activates a pop-up window. Use the ↑ and ↓ keys to select the desired command and press <Enter>. The last command must be "END".

Deleting or Replacing Commands

To delete or replace an already existing command, select the command using the ↑ and ↓ keys and press <Enter> to access the pop-up window. Use the ↑ and ↓ keys to select a replacement and press <Enter>, or press <Delete> to erase the entire command field.



Note:

Blank Command fields in the middle of the Command Program are not accepted when attempting to exit and save the program.

Command Parameters

The Parameters field (see Figure 4-8, Note 4) is not used by all commands (refer to the specific commands listed on the previous two pages for more details). No variables are entered here, only digits. All variables encountered while processing dialed digits are programmed in the digit plan field of the editNet / Dial plan menu.

LEAST COST ROUTE TABLE

The Least Cost Route Tables determine how the FASTNet Switch decides which trunk groups each outgoing call is routed through. These tables allow the owner of the system to use the available resources in the most cost-effective manner. The dialing plans indicate which Least Cost Route table to use for a call.

Programming a Least Cost Route Table

Follow the steps below to create a Least Cost Routing Table:

- 1) From the Fastbase main menu, select editNet / Least cost route and press the <Enter> key. The blinking cursor appears in the Index window (see Figure 4-9).
- 2) Press the <Enter> key and the cursor moves to the Least Cost Route data window on the right side of the screen (see Figure 4-9).

Section 4. Setting Up a Database

- 3) Begin typing in a number for the new Least Cost Route table and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

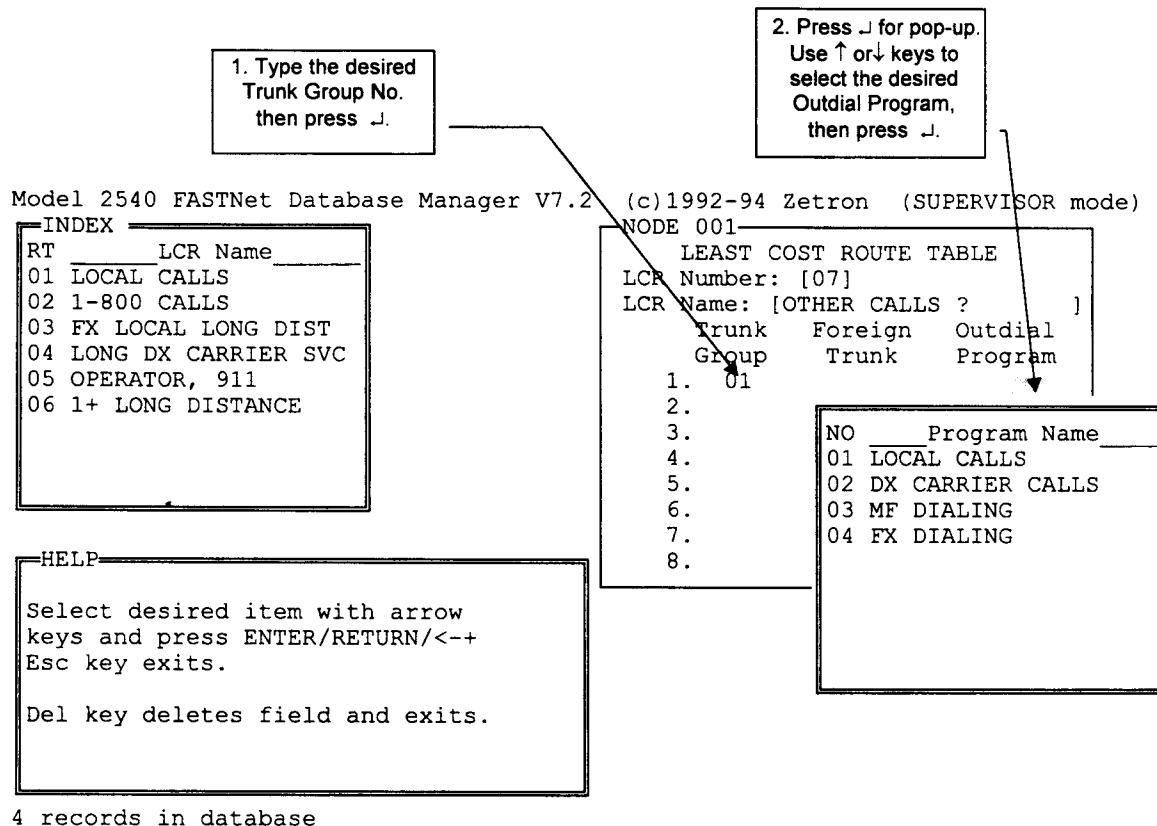


Figure 4-9. Least Cost Routing Table

Up to 99 Least Cost Route tables can be programmed into Fastbase (1-99). Each Least Cost Route table may include up to eight trunk groups. The trunk groups are listed in the order they are searched when looking for an available trunk for placing an outgoing call.

Each Least Cost Route table consists of the following fields:

LCR Number

The LCR Number identifies each table. Enter a unique number assigned to this table.

The LCR Number should be a 2-digit number between 1 and 99. There is no default setting for this field.

LCR Name

The LCR Name also identifies each table. The name is optional, but can be used for sorting.

Enter a descriptive text string, up to 20 characters in length. There is no default setting for this field.

Trunk Group

This field identifies the trunk group used to route the call.

When <Enter> is pressed, a list of programmed trunks appears. Select the appropriate trunk group.

Foreign Trunk

(Not Implemented)

Outdial Program

The Outdial Program defines which outdial program to use on the specified trunk group. The outdial programs must be defined before the Least Cost Route table can be saved.

When <Enter> is pressed, a list of defined outdial programs appears. Select the appropriate outdial program.

DIALING PLAN

The Dialing Plan sets up the correspondence between the number dialed and the Least Cost Routes for each Node User. Each user may be assigned different dialing plans. This is useful for granting cut-rate local long distance carrier privileges to some users and not to others. Also, "1-800" dialing may be limited or blocked through a Node User's dialing plan.

Programming a Dialing Plan

Follow the steps below to create a Dialing Plan:

- 1) From the Fastbase main menu, select EditNet, Dialing Plan and press the <Enter> key. The blinking cursor moves over to the Index window.
- 2) Press the <Enter> key again and the cursor moves to the Dialing Plan window (shown in Figure 4-10) on the right side of the screen.
- 3) Begin typing in a number for your new Dialing Plan and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

Section 4. Setting Up a Database

```
Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)
```

INDEX	
NO	Dialing Plan Name
01	SAMPLE PLAN 1
02	SAMPLE PLAN 2

DIALING PLAN	
Plan Number:	[01]
Plan Name:	[SAMPLE PLAN 1]
Digit Plan	Route Number
1. 411	01
2. 911	05
3. 0	05
4. NXX XXXX	01
5. 1 800 Z	02
6. 1 XXX XXXX	03
7. 1 222 XXXX	04
8. 1 234 XXXX	04
9. 1 333 XXXX	04
10.	
11.	
12.	
13.	
14.	
15.	
16.	
Next Page: N ... 00 On Next Page	

HELP	
Edit:	press ENTER/RETURN/<--+
Guide Window:	F1
Done:	Esc
WARNING: Route(s) must be defined before Dial Plan can be saved.	

Figure 4-10. Dialing Plan Screen

Each dialing plan contains the following fields:

Plan Number

The Plan Number is a unique number assigned to this Dialing Plan. The Plan Number identifies which type of dialing a user can access.

Enter a number between 1 and 99. There is no default setting for this field.

Plan Name

The Plan Name also identifies the Dialing Plan. The name is optional, but can be used for sorting.

A database retrieved from the FASTNet Switch shows all names as "Verified Dial Plan".

Digit Plan

This field defines the patterns that the dialed number is compared against to determine which Least Cost Route to use. The following characters define the digit plans:

0 - 9	specified digit
space	field delimiter
A	0 or 1
X	any digit, 0 - 9
M	any digit, 1 - 9
N	any digit, 2 - 9
Z	any digit (one or more digits to follow)

**Note:**

There is no gain in dialout time using exact matches versus wildcard matches. The FASTNet Switch processes the Dialing Plan selection in virtually the same lapsed time for either case. The advantage of wildcards in the Dialing Plan is to simplify programming.

Enter a string of digits (up to 18) to define the dialing plan. There is no default setting for this field.

Route Number

This field defines which Least Cost Route table should be used for each digit plan. The least cost routes must be defined before the digit plan can be saved.

When <Enter> is pressed, a list of programmed LCRs appears. Select the desired route number.

Next Page

This field accesses a second page of 16 digit plans, for a total of 32 digit plans per Dialing Plan. Y (es) and N (o) are the only entries available.

The maximum number of Digit Plans per Dialing Plan is 3200. All 100 possible Dialing Plans can be "linked" together to form a single dialing plan having 3200 Digit Plans. The 'trade-off' is the decrease in distinct Dialing Plans available.

Section 4. Setting Up a Database

Link To Another Dial Plan

This field allows a link to another dial plan. If the second page of the Dial Plan is full and more Digit Plans are needed, answer Y and the window shown in Figure 4-11 appears. The second dial plan is appended to the end of the current dial plan.

Enter the number of the dial plan to append to this entry.

LINK NUM Dial Plan To Link:

Figure 4-11. Dial Plan Link Number Window

Y (es) and N (o) are the only available entries for the Link field. The default setting is N.



Caution:

Never link the last Dial Plan to the first! This may cause FASTNet to search an endless loop. If this happens, FASTNet generates an error indicating that Dial Plans are “circularly linked together”.

If FASTNet does not find a match in the dialing plan, then the switch cannot route the call and the call is aborted. The order in which Digit Plans appear within a Dialing Plan is unimportant because the FASTNet scans all of the Digit Plans of the specified Node User's Dialing Plan until the 'best match' is found. Typically, many Node Users use the same dialing plan or plans. The Node User is assigned a Dialing Plan and other privileges in the General COS tables. “General Class of Service” on page 4-28 for details.

RADIO SITES

The Radio Sites refer to the repeater and paging terminal sites that are connected to this FASTNet Node either directly or indirectly (such as dialup or on another node). This information tells the FASTNet Switch about the Radio Site and how to communicate with it.

Programming a Radio Site

Follow the steps below to create a Radio Site:

- 1) From the Fastbase main menu, select EditNet / Radio Sites and press the <Enter> key. The blinking cursor appears in the Index window (see Figure 4-12).
- 2) Press the <Enter> key again and the cursor moves to the Radio Site Configuration window on the right side of the screen.

Section 4. Setting Up a Database

- 3) Begin typing in a number for the new Radio Site and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

```
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```

INDEX		
No.	Site Name	TYPE
001	BIG ROCK CANDY MTN	M49N
002	FARAWAY PEAK	RIC

NODE 001	
RADIO SITE CONFIGURATION	
Site Number:	[001]
Site Name:	[BIG ROCK CANDY MTN]
Site serviced by another Node?N...	
Device Type:	[M49N]
Create Date:	03/16/95
Alter Date:	03/28/95

HELP
Edit: press ENTER/RETURN/<-+
Guide Window: F1
Done: Esc

Figure 4-12. Radio Site Configuration Screen

The Radio Site Configuration contains the following fields:

Site Number

The Site Number uniquely identifies the site.

Enter a number between 1 and 255. There is no default setting for this field.

Site Name

The Site Name also identifies the site. The name is optional, but can be used for sorting.

Enter the name as a character string, up to 20 characters in length. There is no default setting for this field.

Site Serviced By Another Node

The Site serviced by another Node field determines how the site communicates with the FASTNet Switch. When a Y is entered, the window shown in Figure 4-13 appears.

Section 4. Setting Up a Database

Figure 4-13 is a screenshot of a terminal window titled "NODE 001" and "RADIO SITE CONFIGURATION". The window contains the following text: "Site Number: [001]", "Site Name: []", "Site serviced by another Node? Y ...", "Device Type: {PAGE}", "Create Date: 07/25/", and "Alter Date: 07/25/". A sub-window titled "XTERNODE" is open, showing "Node: 002".

Figure 4-13. External Node Window

The External Node window contains one field:

Node Enter the node number (1-255) that controls this site.

When an N is entered in the Site serviced by another Node field, the window shown in Figure 4-14 appears.

Figure 4-14 is a screenshot of a terminal window titled "NODE 001" and "RADIO SITE CONFIGURATION". The window contains the following text: "Site Number: [001]", "Site Name: []", "Site serviced by another Node? N ...", "Device T", "Create D", and "Alter Da". A sub-window titled "LOCAL_SITE" is open, showing "Connection Type: DIA" and "DIRECT DIAL".

Figure 4-14. Local Site Window

The Local Site window offers the choices below:

- | | |
|--------|--|
| Direct | Use this setting if the site is connected to the FASTNet Switch using an E&M line type. A window appears prompting for the trunk group (1-99) the Model 2540 should use to connect to the site. |
| Dial | Use this setting if the site is connected to the FASTNet Switch via dialup phone lines. A window appears prompting for the phone number (up to 17 digits) the Model 2540 should dial to connect to the site. |

Device Type

The Device Type field determines what type of radio site (equipment) is being configured. The following repeater controllers are available:

M49N	Radio Site is a Zetron Model 49/459 equipped for networking to FASTNet. All Model 49 Repeater Managers must contain V6.0 or later firmware and a Revision H or later main board.
(or)	
	Radio Site is any Uniden MRS804ZX Repeater with V6.0 or later firmware.
M49	Radio Site is a Zetron Model 49 running V4.x firmware. These units are NOT supported by FASTNet. Do not use!
M48	Radio Site is a Zetron Model 48.
M46	Radio Site is a Zetron Model 46.
M45	Radio Site is a Zetron Model 45.
M40	Radio Site is a Zetron Model 40.
RIC	Radio Site is an EF Johnson Repeater Interconnect unit.
TNT	Radio Site is a Trident LTR™ Logic unit.
PAGE	Radio Site is a Paging terminal. When the page setting is selected the window shown in Figure 4-15 appears.

PAGE_TERM

Trunk Group:00
 Wait For Connection:050
 Wait For Prompt:050
 Answer Supervision:N
 Page Type:

Figure 4-15. Paging Terminal Window

The Paging Terminal window contains the following fields:

<i>Trunk Group</i>	This field tells the Model 2540 which trunk group to use to directly connect to the paging terminal. If the paging terminal is reached by a dial-up connection, enter '0'. In this case, Fastbase uses the phone number entered in the Dial window to connect to the paging terminal. Enter a number between 0 and 99. The default setting is 00 for this field.
--------------------	---

Section 4. Setting Up a Database

<i>Wait For Connection</i>	<p>This field tells the Model 2540 how long to wait for the paging terminal to answer the line and connect the call.</p> <p>Enter a time (in tenths of seconds) between 000 (0 seconds) and 999 (99.9 seconds). The default setting is 50 (5 seconds).</p>
<i>Wait For Prompt</i>	<p>This field tells the Model 2540 how long to wait for a prompt after the paging terminal answers the line. Once the Wait For Connection time has expired, the FASTNet Switch continues to process the call.</p> <p>Enter a time (in tenths of seconds) between 000 (0 seconds) and 999 (99.9 seconds). The default setting is 50 (5 seconds).</p>
<i>Answer Supervision</i>	<p>This field tells the Model 2540 whether the paging terminal provides answer supervision to the trunk.</p> <p>Y (es) and N (o) are the only settings available. The default setting is N.</p>
<i>Page Type</i>	<p>This field determines the type of page being sent to the terminal. The available settings are:</p> <ul style="list-style-type: none">D - display page (numeric)V - voice page (tone-only signal with voice messaging)B - both display and voice paging <p>There is no default setting for this field.</p>

Create Date

This field automatically records the date on which the record was created. This date can be changed for alternate use if so desired.

Enter the date in the format MM/DD/YY. The default setting is the actual creation date.

Alter Date

This field automatically records the date on which the record was last edited. This date can be changed for alternate use if so desired.

Enter the date in the format MM/DD/YY. The default setting is the current date (when a record is "touched").

CLASS OF SERVICE (COS)

Class of Service was developed in order to allow the system operator to quickly and easily assign attributes to one or more users, or change commonly used attributes for many users with one keystroke. Fastbase has the commonly used attributes or user-definable features divided into three logical groups: *general* attributes, *toll* restriction, and allowed *roaming* area.

Efficient Use of the Classes of Service

Each of these three categories can contain up to 255 unique configuration tables, for a total of 765 possible Classes of Service. When setting up these files, it is helpful to use concise, descriptive names for each class of service. For example, one toll restriction class of service may restrict all calls except local calls - this class could be appropriately labeled LOCAL ONLY.

The true power of this configuration is realized by the FASTNet system operator when:

- (1) a single Node User requires a particular feature enabled or disabled, **or**
- (2) an entire group of Node Users need to be granted or denied use of a particular feature

For the single user (item 1), the COS presently in use may be copied to a new COS, then the desired changes may be entered. Then COS specification in that Node User's configuration may finally be changed to the new COS.

For a large group of Node Users sharing a single COS (item 2), the COS file may be edited to include the desired modifications. All Node Users which utilize that COS are affected (when the file is saved and updated, of course).

Classes of Service provide an easy and quick method of enabling/disabling Node User privileges, especially when large groups of users share common features.

Roaming Class of Service

The Roaming COS defines which Radio Sites (outside of their home site) users can access. In this context, roaming refers to the ability of a Node User to access more than one FASTNet Radio Site within a particular Node, or the ability to use more than one Node (including associated Radio Sites).

Section 4. Setting Up a Database

Programming a Roaming Class of Service

Follow the steps below to create a Roaming COS:

- 1) From the Fastbase main menu, select editNet / Roam cos table and press the <Enter> (↵) key. The blinking cursor appears in the Index window.
- 2) Press the <Enter> key again and the cursor moves to the Roaming Sites window on the right side of the screen, as shown in Figure 4-16.
- 3) Begin typing in a number for the new Roaming COS Table and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

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INDEX

COS	Roaming Class Name
001	MODEL 49 SITES

HELP

Select desired item with arrow keys and press ENTER/RETURN/↵ Esc key exits.

Del key deletes field and exits.

2 records in database

NODE 001

ROAMING SITES ENABLED

Roam COS Number: [001]

Roam COS Name: [MODEL 49 SITES]

Site No.	Site No.	Site No.	Site No.
1. 001	2. 002	3.	4.
5.			
9.			
13.			
17.			
21.			
25.			
29.			

No.	Site Name	TYPE
001	BIG ROCK CANDY MTN	PAGE
002	FARAWAY PEAK	RIC

Figure 4-16. Roaming Sites Screen

For each Roaming Class of Service, up to 96 possible sites can be programmed. The sites can be entered in any order from the list of defined sites, however entering a particular site more than once causes an error.

The Roaming Class of Service contains the following fields:

<i>Roam COS Number</i>	<p>This field assigns a unique number to the class of service.</p> <p>Enter a number between 0 and 255. There is no default setting for this field.</p>
<i>Roam COS Name</i>	<p>This field assigns a name to the class of service table. The Name is optional, but can be used for sorting. When retrieved from the FASTNet Switch, this field defaults to "Verified Roaming".</p> <p>Enter a name up to 20 characters in length. There is no default setting for this field.</p>
<i>Site Number</i>	<p>This field allows roaming to the Radio Site entered. The Site Number must have already been defined in the "Radio Site Configuration" subsection.</p> <p>Enter the site numbers (between 1 and 255) that users in this class of service are allowed to roam to and receive service. There is no default setting for this field.</p>
<i>Next Page</i>	<p>This field allows another page of 64 sites to be entered for this class of service. Enter a Y to go to the second page.</p> <p>Y (es) and N (o) are the only available entries. The default setting is N.</p>
<i>On Next Page</i>	<p>This field is a display only field - no user entry is available. The On Next Page field identifies the number of roam sites currently programmed on the next (second) page.</p>

Toll Restrict Class of Service

The Toll Restriction COS establishes which calls are allowed/restricted for the Node User based on an assigned digit plan.

The FASTNet Switch compares the number dialed by a mobile user (Node User) with the programmed digit plans in the specified Toll COS table. The switch first looks for a match with the "Restricted" digit plans. It looks for an exact match or a match with don't care digits. Once a restriction has been found, the switch then looks for a match in the "Allowed" digit plans which would override the restriction.



Note:

A call is restricted only when a 'restriction' is found without finding a corresponding 'allow' to cancel the restriction.

Section 4. Setting Up a Database

Programming a Toll Class of Service Table

Follow the steps below to create a Toll COS Table:

- 1) From the Fastbase main menu, select editNet / Toll cos table and press the <Enter> (↵) key. The blinking cursor appears in the Index window.
- 2) Press the <Enter> key again and the cursor moves to the Toll COS window on the right side of the screen, as shown in Figure 4-17.
- 3) Begin typing in a number for the new Toll COS Table and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

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INDEX	
COS	Toll Class Name
001	LOCAL ONLY: 1-800 OK
002	LOCAL ONLY: NO 1-800

TOLL RESTRICT/ALLOW CLASS OF SERVICE	
Toll COS Number: [001]	
Toll COS Name: [LOCAL ONLY: 1-800 OK]	
Digit Plan	Allow/Restrict
1. 0	R
2. 911	A
3. 1 800 Z	A
4. NXX XXXX	A
5. 1 Z	R
6.	R
7.	R
8.	R
9.	R
10.	R
11.	R
12.	R
13.	R
14.	R
15.	R
16.	R

Next Page: N ... 00 On Next Page

HELP	
Edit:	press ENTER/RETURN/<--+
Guide Window:	F1
Done:	Esc

record saved

Figure 4-17. Toll COS Screen

For each Toll Restriction Class of Service, up to 32 digit plans may be entered. The first 16 appear in the screen as shown in Figure 4-17. The next 16 are shown on a second window when a Y is entered in the Next Page field.

Section 4. Setting Up a Database

In the sample screen of Figure 4-17, each digit plan restricts or allows dialing as follows:

- Line (1) restricts access to the local telco operator to prevent Node Users from bypassing the call restrictions through operator-assisted calling.
- Line (2) allows "911" calls to connect through the FASTNet Switch.
- Line (3) overrides Line 5 to allow "1-800" calls to connect.
- Line (4) provides for local calls to connect through FASTNet.
- Line (5) inhibits all "1+" dialing.

Please note that if any prefixes for these local 7-digit numbers are billed by the local telco as long distance, then a different allow statement(s), and/or an appropriate restrict statement(s) is needed.

The Toll COS table contains the following fields:

<i>Toll COS Number</i>	This field assigns a unique number to the class of service. Enter a number between 0 and 255. There is no default setting for this field.														
<i>Toll COS Name</i>	This field assigns a name to the class of service table. The Name is optional, but can be used for sorting. When retrieved from the FASTNet Switch, this field defaults to "Verified Roaming". Enter a name up to 20 characters in length. There is no default setting for this field.														
<i>Digit Plan</i>	This field defines the patterns that the dialed number is compared against to determine whether it is "allowed" or "restricted".. The following characters define the digit plans: <table><tr><td>0 - 9</td><td>specified digit</td></tr><tr><td>space</td><td>field delimiter</td></tr><tr><td>A</td><td>0 or 1</td></tr><tr><td>X</td><td>any digit, 0 - 9</td></tr><tr><td>M</td><td>any digit, 1 - 9</td></tr><tr><td>N</td><td>any digit, 2 - 9</td></tr><tr><td>Z</td><td>any digit (one or more digits to follow)</td></tr></table>	0 - 9	specified digit	space	field delimiter	A	0 or 1	X	any digit, 0 - 9	M	any digit, 1 - 9	N	any digit, 2 - 9	Z	any digit (one or more digits to follow)
0 - 9	specified digit														
space	field delimiter														
A	0 or 1														
X	any digit, 0 - 9														
M	any digit, 1 - 9														
N	any digit, 2 - 9														
Z	any digit (one or more digits to follow)														
<i>Allow / Restrict</i>	This field determines whether the digit plans entered in this class of service are numbers that are A (llowed) or R (estricted). Enter an A or R in this field. The default setting is R.														

Section 4. Setting Up a Database

<i>Next Page</i>	This field allows another page of 16 digit plans to be entered for this class of service. Enter a Y to go to the second page. Y (es) and N (o) are the only available entries. The default setting is N.
<i>On Next Page</i>	This field is a display only field - no user entry is available. The On Next Page field identifies the number of digit plans currently programmed on the next (second) page.
<i>Link another Toll Restrict</i>	This field enables a link to another Toll Restrict/Allow Table. Answer Y if the second page of the toll class of service is full and more digit plans are needed. A window appears requesting the Toll COS number to link to. The second Toll COS is appended to the end of the current Toll Table. All 255 Toll COS tables may be "linked" into a single super-table, if needed. Y (es) and N (o) are the only available entries. The default setting is N.



Caution:

Never link the last Toll COS to the first! This may cause FASTNet to search an endless loop.

General Class of Service

The General Class Of Service assigns many features to groups of similar users. The General COS assigns timing values to the users and defines which dialing plan is used to route their calls. Many of the settings must be enabled here in the General COS for the feature to be activated. For instance, Telephone Notification (Phone Notify field in the General COS) is enabled in the General COS, even though the actual notification number is entered in the user's record. This means that Telephone Notification must be enabled in the General COS *and* the correct number must be entered in the Node User's record, for the feature to be activated.

Programming a General Class of Service

Follow the steps below to create a General COS Table:

- 1) From the Fastbase main menu, select editNet / General COS and press the <Enter> (↵) key. The blinking cursor appears in the Index window.
- 2) Press the <Enter> key again and the cursor moves to the General COS window on the right side of the screen, as shown in Figure 4-18.
- 3) Begin typing in a number for the new General COS Table and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

```

Model 2540 FASTNet Database Manager V7.2  (c)1992-94 Zetron  (SUPERVISOR mode)

```

INDEX	Class Name
001	GCOS DIAL PLAN 1

HELP
Enter a number from 1 to 255 that uniquely identifies this site.
(This code is required to program Sites and User settings for this node).


```

NODE 001
GENERAL CLASS OF SERVICE
COS Number: [001]
COS Name: [GCOS DIAL PLAN 1 ]
Dialing Plan: 01   Voice Msg Only: N
Roamer Reset: 23:59   Follow Me: N
Mobile to Mobile: Y   Voice Msg: N
----- Forwarding -----
To: phone:Y   mobile:N   voice msg:Y
On: busy:Y   no answer:Y
Max Forwarded Call Time Limit: 020

Ring Out Time:           32
User Message Prompt Limit: 045
Voice Message Limit:     045
Number of Messages:      30
Retention Time:          168
Announcement:            N
Voice Announcement Limit:
Phone Notify: N   Call Splitting: N
Client Welcome Msg: N   Thank You: N
Busy Queuing: N   Call Waiting: N

```

Figure 4-18. General Class of Service Screen

Section 4. Setting Up a Database

The General COS Table contains the following fields:

<i>COS Number</i>	<p>This field assigns a unique number to the class of service.</p> <p>Enter a number between 0 and 255. There is no default setting for this field.</p>
<i>COS Name</i>	<p>This field assigns a name to the class of service table. The Name is optional, but can be used for sorting. When retrieved from the FASTNet Switch, this field defaults to "Verified Roaming".</p> <p>Enter a name up to 20 characters in length. There is no default setting for this field.</p>
<i>Dialing Plan</i>	<p>This field assigns a specific Dialing Plan to each user in this class of service. Every user in the system must be associated with a dialing plan for the Model 2540 to process their outgoing calls.</p> <p>Select the desired Dialing Plan (between 1 and 99) from the list provided. There is no default setting for this field.</p>
<i>Voice Message Only</i>	<p>This field defines the users in this class of service as voice message recipients <i>only</i>. These users are not allowed mobile radio service. For the users to receive voice messaging, the Voice Message field must also be set to Y.</p> <p>Y (es) and N (o) are the only available settings. The default setting for this field is N.</p>
<i>Roamer Reset</i>	<p>This field sets the time of day that a user with roaming privileges should be reset to their home node and radio site. If this field is left blank, a node user must reregister at the home site before resuming normal service following any network roaming activities. This field simply allows the switch to keep better tabs on roaming mobile units.</p> <p>For example, a 'network roamer' travels outside the home site and registers on the local site. At the end of the day, the mobile returns to its home site. If the FASTNet node users in the appropriate COS are reset at midnight (00:00 in this field), then the 'network roamer' doesn't have to register at the home site upon return.</p> <p>Enter a time of day, in 24-hour format (HH:MM). The default setting for this field is '00:00' - reset at midnight.</p>



Note:

When programming a General COS for ESAS™ mobile users, the Roamer Reset field may produce redundant behavior. ESAS™ mobile radios autoregister on their own at specified intervals. As a result, it may not be desirable to program the FASTNet Switch to 'reset' these users at any specified time.

<i>Follow Me</i>	<p>This field enables a 'network roamer' to travel to other radio sites and still receive incoming calls as usual.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>
<i>Mobile to Mobile</i>	<p>This field enables mobile-to-mobile interconnect calls for users in this COS. When an N is entered, the user cannot call another mobile if a telco line is required to make the connection.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is Y.</p>
<i>Voice Msg</i>	<p>This field enables voice messaging capabilities for this COS. If the Voice Msg Only field is set to Y, then this field must also be set to Y.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>

The following General COS fields set the call forwarding parameters. Each of these features must be enabled here before the user can activate them in the voice menu.

<i>To - phone</i>	<p>This field enables call forwarding to a specified telephone number.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>
<i>To - mobile</i>	<p>This field enables call forwarding to a specified mobile radio.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>
<i>To - voice msg</i>	<p>This field enables call forwarding to a specified voice mailbox.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>

Section 4. Setting Up a Database

<i>On - busy</i>	<p>This field enables call forwarding when an incoming caller receives a busy signal.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>
<i>On - no answer</i>	<p>This field enables call forwarding when an incoming caller receives no answer.</p> <p>Y (es) and N (o) are the only available settings for this field. The default setting is N.</p>
<i>Max Forwarded Call Time Limit</i>	<p>This field limits the length of calls forwarded through the FASTNet Switch. It is often desirable to keep a forwarded call brief, since two circuits are required to complete the call.</p> <p>Enter a time limit between 1 and 255 minutes. There is no default setting for this field.</p>
<i>Ring Out Time</i>	<p>This field sets the maximum time that a mobile rings before the call is forwarded (assuming that this time is shorter than the ring out time programmed in the Model 49/459). If the Model 49/459 ring out time (programmed as the “mobile answer time” in Multibase/Ebase/TCBase) is shorter, it will stop the ring out first.</p> <p>Enter a time limit between 20 and 60 seconds. The default setting for this field is 32 seconds.</p>
<i>User Message Prompt Limit</i>	<p>This field determines the maximum length of the user’s personal voice greeting. The user message prompt plays when a caller reaches the user’s voice mailbox.</p> <p>Enter a time limit between 1 and 131 seconds. There is no default setting for this field.</p>
<i>Voice Message Limit</i>	<p>This field determines the maximum length of each message in a user’s voice mailbox. When the Voice Message Limit expires, the Thank You prompt is played (if enabled).</p> <p>Enter a time limit between 1 and 131 seconds. There is no default setting for this field.</p>

Section 4. Setting Up a Database

Number of Messages

This field assigns the maximum number of voice messages a user can accumulate in their mailbox. When the Number of Messages limit is reached, callers are not allowed to leave new voice messages. A message is played to the calling party, indicating that the voice mailbox is currently full.

Enter the limit as a number between 0 and 50. The default setting for this field is 0.



Note:

If the Voice Message Limit is set to zero (0), no voice messages can be recorded, even if the Voice Msg field is enabled.

Retention Time

This field determines how long the FASTNet Switch holds voice messages for the user. Once the Retention Time expires, the stale message is erased.

Enter a time between 1 and 255 hours. There is no default setting for this field.

Announcement

This field enables the outgoing voice announcement for the users in this class of service. The user's announcement plays when a caller dials the user's number. When a Y is entered, calls are automatically routed to the announcement.

Y (es) and N (o) are the only available settings. The default setting for this field is N.

Voice Announcement Limit

This field determines the maximum time length of the announcement message.

Enter a time limit between 1 and 131 seconds. There is no default setting for this field.

Phone Notify

This field enables telephone notification of new voice messages for the users in this class of service. When Phone Notify is set to Y, the user hears beeps upon key-up if messages are waiting in his or her voice mailbox.

Y (es) and N (o) are the only available settings. The default setting for this field is N.



Note:

The Phone Notify field must be set to Y to enable voice message notification. However, the actual message notification features are configured in the Node User / Message Notification window.

Call Splitting This field enables the call splitting function for the users in this class of service.

This feature is not currently available.

Client Welcome Msg This field determines whether the user's personal welcome message is played to the caller in lieu of the System Welcome message. If a Y is entered, the System Welcome Message plays (if one is recorded) upon connection to the FASTNet Switch.

Y (es) and N (o) are the only available settings. The default setting for this field is N.

Thank You This field determines whether the Thank You prompt is played at the conclusion of a call.

Y (es) and N (o) are the only available settings. The default setting for this field is N.

Busy Queuing This field enables all-trunks-busy queuing for the users in this class of service. All-trunks-busy queuing means that when a caller tries to access the FASTNet Switch and all the available telco trunks are currently busy, the caller "gets in line" to wait for the next available trunk.

This feature is not currently available.

Call Waiting This field enables the Call Waiting feature for the users in this class of service.

This feature is not currently available.

NODE USERS

It is best to establish the routing tables, the Radio Sites, and the class of service tables for a FASTNet Switch before beginning to enter user data. As user data is entered, this becomes more apparent.

Each Node User on the FASTNet Switch is identified by a unique 7-digit phone number. These unique numbers are also used to invoke a script on the switch. This means that when a number is dialed, the normal call process is preempted by a script, or factory-programmed process, to perform some function on the switch.

Zetron reserves one phone number to collectively represent mobile users without a FASTNet ID. This number, 999-9999, is used when the Network Phone Number is left blank in Multibase/Ebase/TCBase. When the Model 49/459 passes a user without a network phone number to the Model 2540, the Model 2540 assigns 999-9999 to the user. To allow outgoing calls to be mapped to a Least Cost Routing Table so that FASTNet can process the call, a 999-9999 node user must be programmed in Fastbase.

Programming a Node User

Follow the steps below to create a Node User:

- 1) From the Fastbase main menu, select editNet / node Users and press the <Enter> (↵) key. The blinking cursor appears in the Index window.
- 2) Press the <Enter> key again and the cursor moves to the Roaming Users window on the right side of the screen, as shown in Figure 4-19.
- 3) Begin typing in a number for the new Roaming User and Fastbase creates a new data record filled with default values.

Use the arrow keys (↑ and ↓) to move around from one data field to the next. Other keys perform additional functions. Press <F1> to see the Guide window with hints on what the keys do. Press <F1> again to hide the Guide.

Section 4. Setting Up a Database

```
Model 2540 FASTNet Database Manager V7.2 (c)1992-96 Zetron (SUPERVISOR mode)
```

INDEX			
PhoneNo	User's Name	T	S
1000000	PROCESS 49 COMMANDS	S	V
1000001	PROCESS 49 DIAL UP	S	V
1000002	GET OVER DIAL DIRECT	S	V
1000003	GET OVER DIAL NORMAL	S	V

NODE 001	
NODE USERS	
Phone #:	[]
Name:	[]
User Type:	[N] Valid: [V]
Homed on this Node:	Y ...
Personal Passcode:	
----- CLASS OF SERVICE (COS) -----	
General:	Toll: Roaming:
----- INITIAL FORWARDING -----	
Initial Mode:	R
All Calls:	N.. Busy: .. No Answer: ..
Message Notification:	...
Final Destination:	N ...
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate:	N Num. Mobiles:
Comment:	
Create Date:	07/25/96
Alter Date:	

HELP
Enter Phone Number to reach this USER. This is also the Network phone number to enter in the Model49 user id roamer field.

Figure 4-19. Node User Screen

The Node User window contains the following fields:

Phone Number

This field (also called the FASTNet User ID number) assigns a 7-digit phone number that uniquely identifies each user on the FASTNet Switch.

For DID trunks with feed digits, it may be desirable to enter any 7-digit numbers purchased from the telco. Otherwise, the TCE must append the prefix numbers (prior to the feed digits), since the telco feed digits are typically the last 2-5 digits of the 7-digit phone numbers purchased.

To let mobile users without a FASTNet ID (their Network Phone Number is left blank in Multibase/Ebase/TCBase) make calls, enter 999-9999. The other settings that you program for this special 999-9999 "node user" determine how calls from these mobile users are processed.

Enter a 7-digit phone number that should access this user. There is no default setting for this field.

Name

This field assigns a name to the FASTNet user. This entry is optional, but is very helpful for remembering the number and can be used for sorting. When reviewing "retrieved" files from a FASTNet Switch, the original Node User Name is preserved and appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics").

Enter a text string up to 20 characters in length. There is no default setting for this field.

User Type

This field defines how the phone number is used. The following entries are available:

N	Network user
E	ESAS™ user
D	network Dispatch user
P	Paging user
S	invokes a Script

An N or a blank in this field identifies this FASTNet ID as a regular mobile interconnect user.

ESAS™ User Type

An E in the User Type field defines this FASTNet ID as an ESAS™ mobile radio, with extended calling features. (Optional ESAS™ firmware V 7.x must be purchased and installed in the Model 49/459s at the user's home site and Ebase must manage the repeater database.) The ESAS™ User window appears, as shown in Figure 4-20.

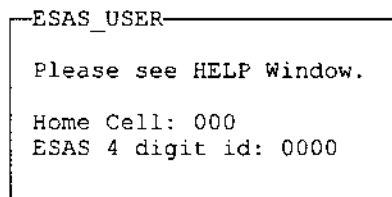


Figure 4-20. ESAS™ User Window

The ESAS™ User window contains the following fields:

<i>Home Cell</i>	This field tells the FASTNet Switch where the user is homed. The Home Cell number corresponds to the first three digits of the ESAS™ User ID (assigned in Ebase).
<i>ESAS™ 4 digit id</i>	This field tells the FASTNet Switch the user's unique ID code. The ESAS™ 4 Digit Id corresponds to the last four digits of the ESAS™ User ID (assigned in Ebase).

Section 4. Setting Up a Database

Network Dispatch User Type

Wide Area Dispatching is an application in which a group of mobiles on **multiple** sites (all of which have the same *half-duplex interconnect* LTR™ ID at each site) are connected in a conversation together, *through the FASTNet trunks only*. This emulates single site dispatching through the FASTNet System, even though the LTR ID codes are not “dispatch” ID codes. This feature is not supported by the Model 459.

It is very important for Dispatch Node Users to realize that only one party may talk and be heard by others at any time, due to the half-duplex operation required for this feature.

Another way to achieve wide area dispatching is by using a special script. The TEAMTALK script allows for faster call setup and turn-around. This script can be used for node users on both Model 49 and Model 459 sites. For more information, see “TeamTalk Dispatch Script” on page 4-53.

Entering a D in the User Type field accesses the network Dispatch User window, as shown in Figure 4-21.

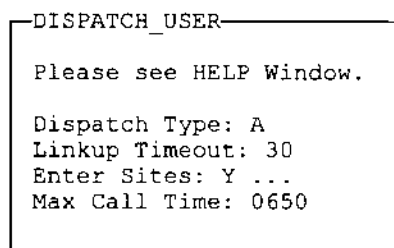


Figure 4-21. Dispatch User Window

The Dispatch User window contains the following fields:

<i>Dispatch Type</i>	<p>This field tells the FASTNet Switch how to handle each site once the dispatch call is connected. The available settings are:</p> <ul style="list-style-type: none">F - Find user; drop all other sites once the user answersA - keep All sites up; even after the user answers <p>The default setting is A.</p>
<i>Linkup Timeout</i>	<p>This field determines the maximum amount of time the FASTNet Switch should keep trying to connect to each site.</p> <p>Enter the time-out as a number between 0 and 99 seconds. The default setting is 30 seconds. Zetron recommends 20-30 seconds for a direct connection and 30-40 seconds for a dialup connection.</p>

Section 4. Setting Up a Database

Enter Sites This field accesses the window shown in Figure 4-22, when a Y is entered. The Dispatch Site window allows entries of sites to include in a dispatch call.

Enter sites (up to 24 available) from the provided list of programmed radio sites.

DISPATCH_SITE			
Site No.	Site No.	Site No.	Site No.
1. 001	2. 102	3.	4.
5.	6.	7.	8.
9.	10.	11.	12.
13.	14.	15.	16.
17.	18.	19.	20.
21.	22.	23.	24.

Figure 4-22. Dispatch Site Window

Y (es) and N (o) are the only available entries for the Enter Sites field. The default setting is Y.

Max Call Time This field sets the maximum time that a network dispatch call can last. Once the maximum call time is reached the call is disconnected. (Warning beeps are issued 5 seconds before disconnect.)

Enter a time between 0 and 650 seconds. The default setting is 650 seconds (10 minutes, 50 seconds). An entry of zero (0) sets an unlimited call length.

The only valid Node-User fields for wide-area dispatching, as far as the FASTNet Switch's database is concerned, are listed in Table 4-2.

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Table 4-2. Valid Node-User Data for Wide-Area Dispatching

Field	Description
Phone Number	7-digit FASTNet User ID number
Name	20-character FASTNet node user name
User Type	D for wide area dispatching
Dispatch Type	F to find one user, then drop all other sites A to bring up all sites
Linkup Timeout	Set to 10 seconds for direct connect and 20-30 seconds for dial-up connection.
Enter Sites ...	Y ... pop-up window appears
Dispatch Site	List of up to 32 preconfigured radio sites to be "dispatched" to from this node
Max Call Time	Leave at default setting - 650 seconds.
Homed on this Node	Leave blank. Not applicable for dispatch.
Acct No	Billing Data
Rate Code	Billing Data
Bill Duplicate	Billing Data
Num. Mobiles	Billing Data
Comment	Remarks for the system operator only

Paging User Type

An entry of P in the User Type field accesses the Paging User window, as shown in Figure 4-23. This allows a page to be sent when a caller leaves a voice or display message. The General COS must be enabled in order for this user to function properly.

PAGING_USER

Please see HELP Window.

Paging Terminal to use:
Dial String:
Default Display:
Maximum Length of Display:12
Send Reminder pages:N
How Often:060

Figure 4-23. Paging User Window

Section 4. Setting Up a Database

The Paging User window contains the following fields:

<i>Paging Terminal to use</i>	<p>This field determines where the pages are routed.</p> <p>Choose a paging terminal from the list of programmed radio sites. There is no default setting for this field.</p>
<i>Dial String</i>	<p>This field assigns the dialing string used to reach the customer's pager.</p> <p>Enter any dialing string, up to 16 digits in length. There is no default setting for this field.</p>
<i>Default Display</i>	<p>This field assigns the display digits to send to the pager if nothing is entered by the caller.</p> <p>Enter any display digits, up to 12 characters. There is no default setting for this field.</p>
<i>Maximum Length of Display</i>	<p>This field determines the maximum length (# of digits) of the display page sent.</p> <p>Enter any number between 1 and 12. The default setting is 12 digits</p>
<i>Send Reminder pages</i>	<p>This field determines whether reminder pages are sent if the user's voice messages are not retrieved. Voice messaging must also be enabled in this user's class of service.</p> <p>Y (es) and N (o) are the only available entries. The default setting is N.</p>
<i>How Often</i>	<p>This field determines how often reminder pages are delivered (if enabled above).</p> <p>Enter a period (in minutes) between 1 and 255. The default setting is 60 minutes.</p>

Script User Type

Scripts are used for very specialized cases and to add new features to an existing system. This subsection describes scripts in general, the default scripts used by FASTNet, the E&M/DID answer tone script, the modem connection script, call forwarding scripts, and the TeamTalk wide-area dispatch script. For examples of databases using scripts, see Section 11, "Example Databases."

Scripts in General

When an S is entered in the User Type field, the window shown in Figure 4-24 appears.

Section 4. Setting Up a Database

RUN_SCRIPT

Please see HELP Window.

Script Name:

Parms:

Figure 4-24. Run Script Window

The Run Script window contains the following fields:

- Script Name* This field tells the FASTNet Switch which script to use. The name must be entered exactly as it exists in the Model 2540 programming.
- Enter up to 8 alphanumeric characters. There is no default setting for this field.
- Parms* This field identifies the parameters used with the script.
- Enter up to 30 alphanumeric characters. There is no default setting for this field.

The only valid Node-User fields for a scripted user, as far as the FASTNet Switch's database is concerned, are listed in Table 4-3.

Table 4-3. Valid Node-User Data for Scripted User

Field	Description
Phone Number	7-digit FASTNet User ID number.
Name	Optional, may be used for sorting.
User Type	S for scripted user.
Script Name	Name of the script invoked.
Parms	Parameters for the script. An apostrophe is used as delimiter between parameters.

Default Scripts

The Phone Numbers **100 0000 to 100 0100** are reserved specifically for invoking scripts which process inbound calls to FASTNet. This is compliant with US telco standards, which disallow "1XX-XXXX" telephone numbers. Each new Node in Fastbase starts with four of these records already existing, as noted below:

Section 4. Setting Up a Database

100 0000 M49CMDS script	Used by FASTNet to control Model 49 (or Model 459 or Uniden MRS804ZX Repeater) E&M 4-Wire interfaces during <i>inbound</i> call processing. The script runs all overhead protocol between the Model 49/459 and the FASTNet software control. These interfaces are referred to as “directly connected”, even if via RF or μ wave link, because of the direct control of the E&M interface. This script is automatically selected in TCE when a “Model 49” interface is specified. When the FASTNet trunk receives an inbound call, then the OPARAM.CDS file (configured by TCE) specifies for the trunk card to expect ‘0’ inbound digits, and to send Node User number 100 0000 to the FASTNet CPU. When the CPU looks up Node User 100 0000, it runs the M49CMDS script for that call. (Refer to Section 7 for TCE programming)
100 0001 M49DCMDS script	Used by FASTNet to control “dialed-up” Model 49/459 units during <i>inbound</i> call processing. This script provides for Zetron “Network Tones” (DTMF “B*”) to be transmitted when the trunk answers the telco line. The Model 49/459 uses these tones to acknowledge that the line was answered by FASTNet. This script is automatically selected in TCE with certain telco interface options. (Refer to Section 7 for TCE programming)
100 0002 GETODIAL script	Handles E&M and DID trunk (<i>inbound</i>) operations to process User ID overdialing in DTMF, or Pulse protocol. This script is automatically selected in TCE with certain telco interface options. (Refer to Section 7 for TCE programming)
100 0003 PULSEDID script	Used by FASTNet to process User ID DTMF or pulse overdialing <i>inbound</i> to End-to-End trunks.

These node user records, 1000000 through 1000100, may not be deleted from the node users once they have been added. This insures that these records are not inadvertently removed. More numbers in this range may be added, but they can not be deleted once they have been added. Before Fastbase allows the Script Name to be changed for a particular Phone Number, it queries the user to make sure the change should be made.

Normal telco operations do not usually require scripts other than the defaults. Should a need for a different interface arise, please contact Zetron.

Section 4. Setting Up a Database

E&M/DID Answer Tone Script

For E&M and DID lines, the M49DCMDS script should be programmed on one of the available DID numbers (see “Default Scripts” on page 4-42). No parameters are entered for this script.



Note:

This script is NOT default-loaded by Fastbase.

Modem Connection Script

The PSITExxx script provides rapid modem connection to a Model 49/459 site (xxx = site number). It can also be used for troubleshooting.



Note:

This script is NOT default-loaded by Fastbase.

The PSITExxx script is manually loaded by configuring a DID as illustrated in Figure 4-25. No parameters are entered for this script.

Figure 4-25 shows the 'Run Script Window for Model 49/459 Dial-up Programming'. The window contains the following fields and sections:

- NODE 001**
 - NODE USERS**
 - Phone #: [5470002]
 - Name: [NODE SITE 02 M49 PGM]
 - User Type: [S] Valid: [V]
 - RUN_SCRIPT**
 - Please see HELP Window.
 - Script Name: PSITE002
 - Parms: (No PARMS entered.)
 - Message Notification:**
 - Final Destination: N
 - Acct No: Rate Code:
 - Bill Duplicate: N Num. Mobiles:
 - Comment:
 - Create Date: 09/11/96
 - Alter Date:

Callouts explain the fields:

- DID Node User ID code, which is 547-0002 in this example.
- This Node User is a Model 49, to be programmed by a computer and Modem dialed into this Node via DID line. The computer sends the telephone # 547-0002.
- Select Scripted User for this Node User ID type.
- Enter "PSITExxx": Where "xxx" is the editNet "Radio Site" number (001-255). "PSITExxx" is the "Program Model 49 @ Radio Site xxx" script used for Model 49 or MRS804ZX programming when dialing through a Node.
- No PARMS entered.

Figure 4-25. Run Script Window for Model 49/459 Dial-up Programming

This script can be used for troubleshooting because it allows you to call the PSITExxx number, which cuts you through to the Model 49/459, and then you can over dial. If a user's mobile radio does not ring when you call the node user on the FASTNet, you can use this script to determine if the problem is in the FASTNet database or in the Model 49/459 database. First, of course, you should determine if the problem is in the hardware by calling a known good mobile number. Then, call the PSITExxx number and over dial the radio's access number. If the radio rings, the Model 49/459 database is not the problem but the FASTNet database probably has a field filled in incorrectly. If the radio does not ring, the Model 49/459 database probably has a field that is filled in incorrectly.

See Example #1 in Section 11, "Example Databases," for an example of using the PSITExxx script.

Call Forwarding Scripts

Three scripts provide special call forwarding on the FASTNet switch. The three scripts are IFORWARD, FWDVMESS, and CALLERD. The IFORWARD script *always* forwards one number to another. The FWDVMESS script forwards one number *directly* to another number's voice messaging. The CALLERD script allows a caller to control or redirect a call by pressing 1 to 9. See Section 11 for examples of call forwarding scripts.



Note:

These scripts are NOT default-loaded by Fastbase.

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IFORWARD Script

The IFORWARD script routes calls from one number to another number on the switch, so the user has two phone numbers that call the same mobile and have the same voice mailbox.

Typically this script is used to avoid telco toll charges for callers calling a user from a foreign exchange phone. It allows a user to have a local calling presence in another area that is a long distance phone call away. A foreign exchange caller can call the user's foreign exchange number (so it's a local call for the caller), and the call is forwarded to the user's regular number. To callers in the foreign exchange area, the call is exactly the same as if they had called the user's regular number.

To set up a node user for using the IFORWARD script, make the following settings in Fastbase programming. In Node Users on the main NODE xxx screen, enter the following settings:

<i>Phone #</i>	<p>This field is for the number that the caller dials and from which the call is forwarded. For example, if 488-6363 is a foreign exchange number and the user's regular number is 820-6363, enter 488-6363 so that calls to 488-6363 can be forwarded to 820-6363.</p> <p>Enter a 7-digit phone number. There is no default setting for this field.</p>
<i>Name</i>	<p>This field can be used to help you remember what this scripted number is used for. It appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics"). It does not have to be the script name. For example, you could enter "820-6363 FX #."</p> <p>Enter a text string up to 20 characters in length. There is no default setting for this field.</p>
<i>User Type</i>	<p>This field must be set to S.</p>
<i>Valid</i>	<p>This field must be set to V.</p>

When you select S for User Type, the Run Script window pops up (see Figure 4-24). Enter the following settings:

<i>Script Name</i>	<p>This field tells the FASTNet Switch which script to use. The name must be entered exactly as it exists in the Model 2540 programming. In this case, enter IFORWARD.</p>
--------------------	--

Parms This field identifies the parameters to use with the script. In this case, enter the number to forward the call to. For example, 8206363 if that is the phone number where calls are to be forwarded to.

Figure 4-26 shows a DID configuration for using the IFORWARD script.

NODE 001	
NODE USERS	
Phone #:	[4886363]
Name:	[820-6363 FX #]
User Type:	[S] Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: IFORWARD	
Parms: 8206363	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 09/11/96	
Alter Date:	

Figure 4-26. Run Script Window for the IFORWARD Script

FWDVMESS Script

The FWDVMESS script routes calls from one number to another number on the switch and then forces that number immediately into voice message mode. So, users can have another phone number that goes straight to voice messaging.

A typical use is to give mobile users another number so they can screen calls. A caller to the phone number immediately hears the mobile's voice message greeting and can leave a message. The call does not ring the mobile. However, the message beeps do alert the mobile that a voice message has been left.

To set up a node user for using the FWDVMESS script, make the following settings in Fastbase programming. In Node Users on the main NODE xxx screen, enter the following settings.

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<i>Phone #</i>	<p>This field is for the number that is given to users so that their callers access voice messaging directly without ringing the user's mobile. You would enter 820-6301 if you wanted callers calling 820-6301 to just leave a message.</p> <p>Enter a 7-digit phone number. There is no default setting for this field.</p>
<i>Name</i>	<p>This field can be used to help you remember what this scripted number is used for. It appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics"). It does not have to be the script name. For example, you could enter "leave message only."</p> <p>Enter a text string up to 20 characters in length. There is no default setting for this field.</p>
<i>User Type</i>	<p>This field must be set to S.</p>
<i>Valid</i>	<p>This field must be set to V.</p>

When you select S for User Type, the Run Script window pops up (see Figure 4-24). Enter the following settings.

<i>Script Name</i>	<p>This field tells the FASTNet Switch which script to use. The name must be exactly the same as what is in the Model 2540 programming. In this case, enter FWDVMESS.</p>
<i>Parms</i>	<p>This field identifies the parameters to use with the script. Enter the user's number that has voice messaging. For example, 8206363 if that is the user's number that has voice messaging.</p>

Figure 4-27 shows a DID configuration for using the FWDVMESS script.

NODE 001	
NODE USERS	
Phone #: [8206301]	
Name: [leave message only #]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: FWDVMESS	
Parms: 8206363	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 09/11/96	
Alter Date:	

Figure 4-27. Run Script Window for the FWDVMESS Script

CALLERD Script

The CALLERD script allows caller-directed phone call processing. For example, after business hours the user may want callers to press 1 to leave a message that Bill can check in the morning, press 2 to ring Bill's mobile, press 3 to page Bill, and press 4 to hear an announcement about current projects.

A base phone number (00 used for the announcement) and the following nine numbers make up a block of ten numbers that are used for processing the call and choice made by the caller. For the example above, 0016400 could be the base number, and 0016401 would go directly to Bill's voice mailbox, 0016402 would ring Bill's mobile, 0016403 would page Bill, and 0016404 would play an announcement.

The following steps describe a call using the CALLERD script.

- 1) The caller dials the number that is set up for caller-directed phone call processing.
- 2) The caller hears the announcement, then three quick beeps, and then 5 seconds of silence.
- 3) Anytime during step 2, the caller presses a key and sends a DTMF digit.
- 4) The site listens for DTMF during step 2. If no DTMF is detected, then the call proceeds as though a DTMF 1 was detected.
- 5) This action varies depending on the DTMF digit detected:
 - A) If a DTMF 0 is detected, the caller (usually the user) can record or rerecord the announcement (see "User Voice Access Method" in Section 9).

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- B) If a DTMF 1 through 9 is detected, then the call is forwarded to [base number + detected digit].

A user with a CALLERD scripted number records or rerecords the announcement by following the instructions below (also see "User Voice Access Method" in Section 9).

- 1) During the announcement, press 0. If an announcement has not yet been recorded, press 0 during the three beeps and 5 seconds of silence.
- 2) Enter the personal passcode for the base number.
- 3) Press 8 at the main menu prompt.
- 4) Press 4 at the greeting menu prompt.
- 5) Speak the announcement and hang up quietly by pushing down the switch hook on the calling phone.

To set up a node user for using the CALLERD script, there are five steps:

- 1) Set up a Node Users screen for the phone number callers should call.
- 2) Set up the Run Script window.
- 3) Set up the General COS window for the base number.
- 4) Set up a Node Users screen for the base number.
- 5) Set up a Node Users screen for the choice (1 to 9) numbers.

Step 1: In Node Users on the main NODE xxx screen, enter the following settings.

<i>Phone #</i>	This field is for the number to do caller-directed processing on. You would enter 820-6400 if you wanted callers to call 820-6400 after hours and direct their calls depending on the situation. Enter a 7-digit phone number. There is no default setting for this field.
<i>Name</i>	This field can be used to help you remember what this scripted number is used for. It appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics"). It does not have to be the script name. For example, you could enter "Bill's callerd #."
<i>User Type</i>	This field must be set to S.
<i>Valid</i>	This field must be set to V.

Step 2: When you select S for User Type, the Run Script window pops up (see Figure 4-24). Enter the following settings.

- Script Name* This field tells the FASTNet Switch which script to use. The name must be entered exactly as it exists in the Model 2540 programming. In this case, enter CALLERD.
- Parms* This field identifies the parameters to use with the script. Enter the base number for this CALLERD group. Do not use valid telco feed numbers. For example, enter 00164000.

Figure 4-28 shows a DID configuration for using the CALLERD script.

NODE 001	
NODE USERS	
Phone #: [8206400]	
Name: [Bill's callerd #]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: CALLERD	
Parms: 0016400	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 09/11/96	
Alter Date:	

Figure 4-28. Run Script Window for the CALLERD Script

Step 3: In the General Class of Service screen (see Figure 4-18 on page 4-29), enter the following settings.

- COS Number* This field assigns a unique number to the class of service (and must be entered as the General COS number in the Node user record for the base number in Step 4).
- Enter a number between 0 and 255. There is no default for this field.
- COS Name* This field can be used to help you remember what this COS is used for. In this example, you might enter "callerd announ."

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Announcement This field (near the bottom of the screen) must be set to Y.

Voice Announcement Limit This field determines the maximum time length of the announcement.

Enter a time limit between 1 and 131 seconds. There is no default setting for this field.

Step 4: The base phone number entered in Run Script window in the Parm's field (0016400 in the above example) must be programmed as an announcement-only number. In Node Users on the main NODE xxx screen, enter the following settings.

Phone # This field is for the number that is in the Parm's field of the Run Script window. You would enter 0016400 using the example above.

Name This field can be used to help you remember what this number is used for. It appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics"). For example, you could enter "Bill's callerd announ."

Enter a text string up to 20 characters in length. There is no default setting for this field.

User Type This field must be set to N.

Valid This field must be set to V.

Personal Passcode This field assigns a passcode to this announcement-only phone number. The passcode can be up to four characters long, letters or number or a combination of the two.

This passcode prevents unauthorized changes to the announcement. Zetron strongly recommends using a passcode for the base number because without a passcode, anyone can change the announcement!

General This field is for the general class of service (COS).

Enter the COS number assigned in Step 3.

Initial Mode This field must be set to A (announce).

All Calls This field must be set to N.

Step 5: The phone numbers for the 1 to 9 choices must be programmed (0016401 through 0016409 if nine choices are made available to the caller). Typically the numbers are forwarded to existing DID numbers using the IFORWARD script (see "IFORWARD Script" on page 4-45). The numbers can also be programmed as announcement-only numbers or as mobiles, mailboxes, or mobile phones exclusively accessed by the caller-directed number (see "Programming a Node User" on page 4-35).

TeamTalk Dispatch Script

TeamTalk provides multiple-site dispatch between Model 49/459 sites directly connected to a FASTNet Switch. It provides faster call setup and turnaround than the network dispatch user type (see "Network Dispatch User Type" on page 4-38).

To create a TeamTalk Dispatch call, a FASTNet node user must be programmed to use the TEAMTALK script. The sites to be included in the TeamTalk Dispatch call must be defined in a roaming COS. And each site to be included must also be programmed with a half-duplex interconnect LTR ID in Multibase/TCBase. To use a telco line to initiate and participate in a TeamTalk Dispatch call, a telco number is forwarded to the TeamTalk scripted number.

To set up a node user for using the TEAMTALK script, make the following settings in Fastbase programming. In Node Users on the main NODE xxx screen, enter the following settings.

<i>Phone #</i>	<p>This field is for the number that is given to users so that they can initiate a dispatch call to their TeamTalk group. It is also called the TeamTalk ID. Do not use valid telco feed numbers. For example, enter 0001111.</p> <p>Enter a 7-digit phone number. There is no default setting for this field.</p>
<i>Name</i>	<p>This field can be used to help you remember what this scripted number is used for. It appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics"). It does not have to be the script name. For example, you could enter "Bill's Team."</p> <p>Enter a text string up to 20 characters in length. There is no default setting for this field.</p>
<i>User Type</i>	This field must be set to S.
<i>Valid</i>	This field must be set to V.

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When you select S for User Type, the Run Script window pops up (see Figure 4-24). Enter the following settings.

<i>Script Name</i>	This field tells the FASTNet Switch which script to use. The name must be exactly the same as what is in the Model 2540 programming. In this case, enter TEAMTALK.
<i>Parms</i>	<p>This field identifies the parameters to use with the script. For the TeamTalk script, there are three parameters: the roaming COS number that ties the sites together, the site overdial number, and the inactivity timeout.</p> <p>The site overdial is dialed into the Model 49/459 at each site in the group. The site overdial must be the same 4 or 5 digit number for all sites in the group.</p> <p>Enter an apostrophe between parameters. For example, 50'2222'10.</p>

To set up a node user for initiating a TeamTalk dispatch call from a telco number, make the following settings in Fastbase programming. In Node Users on the main NODE xxx screen, enter the following settings.

<i>Phone #</i>	<p>This field is for the telco number that is given to users so that they can initiate a dispatch call to their TeamTalk group. For example, enter 8201111.</p> <p>Enter a 7-digit phone number. There is no default setting for this field.</p>
<i>Name</i>	<p>This field can be used to help you remember what this scripted number is used for. It appears in the node user file (see "Node User Records, User File Data Lines" in Section 6, "Billing and Statistics"). It does not have to be the script name. For example, you could enter "Bill's Team."</p> <p>Enter a text string up to 20 characters in length. There is no default setting for this field.</p>
<i>User Type</i>	This field must be set to S.
<i>Valid</i>	This field must be set to V.

When you select S for User Type, the Run Script window pops up (see Figure 4-24). Enter the following settings.

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<i>Script Name</i>	This field tells the FASTNet Switch which script to use. The name must be exactly the same as what is in the Model 2540 programming. In this case, enter IFORWARD.
<i>Parms</i>	This field identifies the parameters to use with the script. To forward the call to the scripted TeamTalk number, enter the TeamTalk ID. In the above example, you would enter 0001111.

For information about setting up a roaming COS to link the sites in a TeamTalk group, see "Programming a Roaming Class of Service" on page 4-24. For information about Multibase settings, see Section 5. A practical example of TeamTalk is presented in Section 11.

Valid

This field determines if the user can access the system as normal. This setting is useful when a customer does not pay their bill or needs to be invalidated for another reason. The following settings are available:

V	Valid; the user has all programmed system privileges.
I	Invalid; the user cannot access the system.

The default setting for this field is V.

Homed on this Node

This field tells the FASTNet Switch(es) where to locate the Node User, unless that user has registered to another node while "network roaming". Each Roaming Node User in the FASTNet Switch (does not include paging users, scripted users, or network dispatch) has a "home base".

After "network roaming" and registering into a different node, the Node User gets 'reset' to the "homed" node, *only if* General COS / Roamer Reset is enabled, when the specified time of day occurs.

If the user is homed on this FASTNet Switch (node), enter a Y. The Node window appears, prompting for the site number. Choose the programmed site from the list provided.

If this user is homed on a different FASTNet Switch (node), enter an N. The window shown in Figure 4-29 appears.

OTHER_NODE

Node Number:
Phone Number:

Figure 4-29. Other Node Window

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The Other Node window contains the following fields:

<i>Node Number</i>	This field assigns the number of the FASTNet Switch (node) on which the user is homed. Enter the node number between 0 and 255. There is no default setting for this field.
<i>Phone Number</i>	This field determines the phone number to connect to the home node. Enter a seven digit phone number to reach the other node. There is no default setting for this field.

Y (es) and N (o) are the only available settings for the Homed on this Node field. The default setting is Y.



Caution:

DO NOT, under any circumstances, set the Homed on this Node field to Y for any specific Node User ID in *more than one node*. The user will be unable to function properly within the FASTNet System.

Conflicting “home” status causes each of the Nodes to pass incoming calls for that Node User to other “home” nodes, in an endless search for the true “home” node.

NO error messages exist for this condition !!

Personal Passcode

This field assigns a PIN (personal identification number) to the user. The passcode is used to access the voice menu.

Enter a passcode, up to four characters in length. The passcode can be letters or numbers or a combination of the two. The default setting for this field is a blank character string - *no passcode* (or PIN) is required to enter the voice menu.

Class Of Service (COS)

Three classes of service must be assigned to each interconnect mobile user. Refer to “Class of Service” starting on page 4-23 for descriptions of each Class of Service. Choose the desired class of services from the list of programmed classes.

<i>General</i>	Select a General COS from those previously defined.
<i>Toll</i>	Select a Toll Restriction COS from those previously defined.

Roaming

Select a Roaming COS from those previously defined. Once a Roaming COS is selected, the window shown in Figure 4-30 appears, to enter the overdial digits for each site.

OVER_DIAL		
Site	Over	Dial
001:		
002:		
101:		
102:		

Figure 4-30. Overdial Window



Note:

Overdial digits MUST be entered for EVERY roam site, before the database can be downloaded to the FASTNet Switch.

Initial Forwarding Options

These forwarding features *must* be enabled in the General COS assigned to this user, or the FASTNet Switch ignores the settings. Once these variables are set, they only determine the state of these features when the user record is first added to the FASTNet database. Once a user is up and running, the user can change these settings through the voice menu. The user's changes always take precedence over any changes the operator may make to these settings. If the operator is adamant about changing these settings, the user's record must be deleted and then added again.

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The initial forwarding fields are described below:

Initial Mode This field defines where the Node User's *inbound* calls are routed to (for call forwarding situations). The Initial Mode is what the user starts out in when the record is first added to the FASTNet database. The following settings are available:

A - Announce

User can record an announcement to play for inbound callers, if enabled in the General COS. This message is played to the inbound caller when:

- the node user has personally selected this option (or)
- the voice mailbox is full

An announcement is typically used to notify callers to reach the user at a different location, or to contact a third party, etc.

M - voice Messaging

Inbound callers can leave a recorded voice message for the user.

R - Routing

Calls are processed normally.

The default setting is R.



Note:

The Announcement is different from the Client Welcome Message, which answers the call prior to forwarding to the Announcement.

All Calls This field determines whether all calls are forwarded. When a Y is entered, a box appears prompting for the phone number to dial.

Y (es) and N (o) are the only settings available. The default setting is N.

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Busy

This field determines where calls are forwarded to on a busy condition. The following settings are available:

M - voice Messaging

P - to a Phone number

blank field - no forwarding on busy

When a P is entered, a box appears prompting for the phone number to dial.

The default setting is a blank field - no forwarding.

No Answer

This field determines where calls are forwarded to when the line is not answered. The following settings are available:

M - voice Messaging

P - to a Phone number

blank field - no forwarding on busy

When a P is entered, a box appears prompting for the phone number to dial.

The default setting is a blank field - no forwarding.

Message Notification

This field determines how the FASTNet Switch notifies the user that their voice mailbox has messages that have not yet been accessed/reviewed. The following settings are available:

B - message reminder Beeps

The user is notified by three short beeps at regular intervals (set in the FASTNet Switch in Use Window in Ebase, Multibase, or TCBase).

P - Page

The user is notified by dialing a specified number, voice message, or a page.

A - All of the above notification methods

blank field - no message notification

When a P or A is entered the window shown in Figure 4-31 appears. Table 4-4 describes the fields in the Notification window.

The default setting for Message Notification is a blank field.

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NOTIFICATION

Destination:

Parms:

Figure 4-31. Notification Window

Table 4-4. Message Notification Window Fields

Field Name	Description	Available Settings
Destination	This field determines where the notification should be sent. Choose from the pop-up list provided.	vmail - sends voice message to the specified phone number pager - sends a page through the specified paging terminal dial - dials the specified phone number
Parms	This field assigns the parameters for dialing and messaging.	Enter the phone number to dial, followed by an apostrophe ('), and the digits to over dial for pager message, etc. A comma (,) inserts a 2 second pause in the dialing string.

Final Destination This field determines whether forwarded calls are forwarded a second time if the call isn't completed. When this feature is enabled, the call is forwarded to a "final destination". The window shown in Figure 4-31 appears when a Y is entered.

Y (es) and N (o) are the only settings available. The default setting is N.

Billing Information Options

The following items only pertain to Node User billing functions. These fields are not used internally by the FASTNet Switch. The data from these fields is downloaded with billing information to facilitate whatever billing software package is used by the system operator. A detailed discussion of billing information and retrieval is provided in Section 6.

Account Number This field assigns a customer account number to this FASTNet ID for billing purposes only.

Enter an account number, up to 10 characters in length. This field can be left blank. There is no default setting for the Account Number field.

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Rate Code This field assigns a Rate Code for billing purposes only. It may be useful to enter a short word or abbreviation that describes the billing type. For example, VIP might be a good Rate Code for very important users with low rates.

Enter a text string, up to 5 characters in length. There is no default setting for the Rate Code field.



Note:

Do NOT set the Bill as Duplicate field to Y unless you are certain that billing information is stored elsewhere (possibly Ebase, Multibase, or TCBase) for this user.

Bill as Duplicate This field determines whether the user is billed elsewhere. Enter a Y to indicate that this customer appears in another billing database to avoid duplicate charges.

Y(es) and N(o) are the only settings available. The default setting is N.

Num Mobiles This field indicates that more than 1 mobile radio is assigned to this FASTNet phone number. This field doesn't affect operation; it simply provides billing information.

Enter a number between 0 and 999. The default setting is a blank field - only one mobile is assigned to this FASTNet phone number.

Comment This field is purely for the operator's use, to provide additional information about the user record.

This field is not used by FASTNet. This information is not written to FASTNet, and therefore cannot be "retrieved" - it only exists in the original Fastbase files.

Create Date This field automatically records the date on which the record was created. This date can be changed for alternate use if so desired.

Enter the date in the format MM/DD/YY. The default setting is the actual creation date.

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Alter Date This field automatically records the date on which the record was last edited. This date can be changed for alternate use if so desired.

Enter the date in the format MM/DD/YY. The default setting is the current date (when a record is "touched").

UPDATING DATABASE CONFIGURATION TO THE MODEL 2540

Once the Node Configuration, Radio Sites, Node Users, Class of Service Tables, Dialing Plan, Least Cost Routes, and Outdial Table are programmed correctly, the data should be transferred to the FASTNet Switch. The Fastbase information is stored in data files on the office computer. To send these files to the nodes, follow the steps below:

- 1) Select cOmm49 from the Fastbase main menu.
- 2) Select Update from the communications menu.
- 3) Choose the item(s) to be transferred from the Update menu. The site can be updated one part at a time (Routing, Node config, etc.) or as a whole unit. In addition, the node can be updated only for the changes that have been made since the last update.

When the database is configured for the first time, it is easiest to select Entire database from the Update choices.

Fastbase connects to the switch and completes the data transfer automatically.

Entire Database Updates

When Entire database is selected from the Update menu, all the unused parameters in the Model 2540 are forced to the default or disabled values (as appropriate). This ensures that the switch data matches the database.

This may not be true, however, if updates are performed for individual sections of the database. Choosing Changes from the Update menu provides a good measure of efficient and accurate data transfers.

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5. UPDATING MULTIBASE, EBASE, OR TCBASE

APPLICATION

If the FASTNet Switch was purchased as an addition to an existing Model 49/459 site(s), the Repeater Manager Database must be appropriately modified. If the FASTNet Switch was purchased in conjunction with Model 49/459(s), then this section can be used to understand the relationship between the Fastbase (V 7.x) and Multibase (V 6.x), Ebase (V 7.x), or TCBase programs.

This section highlights *only the FASTNet-related changes* to the Model 49/459 database. For a complete description of the site database, please refer to the *Model 49 Multibase Version 6.1 or Above Operation Manual* (Part No. 025-9297), the *Model 49 Ebase Operation Manual* (Part No. 025-9402), or the *Models 459 & 452 TCBase Operation Manual* (Part No. 025-9451). All of the example screens shown in this section are from Ebase V7.2.

SITE CONFIGURATION

The Site Configuration requires some extensive reprogramming to become compatible with Fastbase and the Model 2540 Switch. The following changes setup the entire Model 49/459 site for FASTNet interface.

FASTNet/ESAS Site/Cell Number Field (*Ebase only*)

The first field that needs to be altered for the Model 49 database is the FASTNet/ESAS Site/Cell Number. This field may have contained an ESAS™ cell number.

If the site is equipped with ESAS™ Model 49s, enter the cell number assigned by the Federal Communications Commission. This number can be from 0 to 127.



Note:

The number entered in this FASTNet/ESAS Site/Cell Number or FASTNet Radio Site Number field should correspond to one of the Radio Sites created in Fastbase.

FASTNet Fields

Several fields in the FASTNet window must be modified to accommodate FASTNet operation. To access the FASTNet window, enter a Y in the Interconnect field at the bottom of the Site Config screen, and then enter another Y in the FASTNet Switch in Use field. The FASTNet window shown in Figure 5-1 appears.

Section 5. Updating Multibase, Ebase, or TCBase

Model 49 LTR/ESAS Database Manager V7.2e (c)1995 Zetron (SUPERVISOR mode)

INDEX				
Site	Site Name	C #	E	I
0001	FASTNET EXAMPLE SITE	001	Y	Y
0002	GHOST REPEATERS SITE	001	N	Y
0003	VOICE & TONE PROMPT	001	N	N
0004	MISCELLANEOUS EXS	001	N	Y
0010	CINDY'S TEST SITE	001	Y	Y
0111		001	N	N

SITE_CONFIG	
Site Number:	{0010}
Site Name:	{CINDY'S TEST SITE }

INTERCONNECT	
DTMF Timeouts --	
Interdigit:	5.0 First Digit:5.0
Regenerated Digits --	Min:07 Max:11
Require Dialtone:	N
BusyUp for Programming:	N
Mobile Turn-Around Time:30	
Overdial Access #:	Y

FASTNET	
FASTNet Phone Number:	
Reporting Repeater:	
Roaming Batch Interval:	05
Message Beep Interval:	05
Store SMDR Recs to FASTNet Calls:	Y

HELP	
Enter the Phone number of the FASTNet switch to which we want to report. If the switch is connected via 4-wire E&M, this number is not used.	

Figure 5-1. Ebase FASTNet Window

The FASTNet window contains the following fields:

FASTNet Radio Site Number (Multibase and TCBase)

If the site is not equipped with ESAS™ Model 49s, enter an appropriate FASTNet Site Number. This number can be from 1 to 255. This does not need to be the same as the Model 49 Site number, but it is a good idea to keep the two numbers the same.

FASTNet Phone Number

The FASTNet Phone Number is used when the Model 49/459s are *not directly connected* to the Model 2540. The Switch uses the M49DCMDS script to process inbound calls from remotely located Model 49/459 units. If this Model 49/459 site is directly connected to the FASTNet Switch (four-wire E & M), then this field is not used.

Enter the phone number that the Model 49/459 must dial to establish a communication link with the FASTNet Switch.

Reporting Repeater

Only one repeater at a site is designated to communicate site information to the FASTNet Switch. All other Model 49/459s at the site forward any information to the designated reporter. The Reporting Repeater collects this information until the Roaming Batch Interval has expired, or until the message queue is full. Then the reporter initiates a communication link with the FASTNet Switch and forwards all the site information.

Section 5. Updating Multibase, Ebase, or TCBase

Enter the repeater number of the unit that should communicate site information to the FASTNet Switch.

Roaming Batch Interval

This is the amount of time that must expire before the Reporting Repeater establishes a communication link and forwards any accumulated information to the FASTNet Switch. If this batch time expires and there isn't any information to be forwarded, the Reporting Repeater simply restarts the batch timer. On the other hand, if the Reporting Repeater's message queue is full, it forwards the information and restarts the batch timer, regardless of whether the batch timer has expired.

Enter an interval between 1 and 60 minutes. An entry of 0 sets the batch interval to 15 seconds. For directly connected sites, always enter 0. The default setting is 5 minutes.

Message Beep Interval

If a Node User has a voice message that has not been retrieved, the FASTNet Switch tells the Model 49/459 to turn on message beeps for that user's LTR™ ID. The Message Beep Interval is the amount of time that must elapse between sending the message beep tones to the LTR™ ID.

Enter an interval between 1 and 60 minutes. The default setting is 5 minutes.

Store SMDR Recs to FASTNet Calls

The Store SMDR Records field indicates whether calls stored in the FASTNet Switch should also be duplicated in the Model 49/459s (498 for an ESAS™ system). When a Y is entered, calls to the FASTNet Switch are recorded in the Model 49/459's SMDR storage. An N in this field prevents duplicate records from being stored if the FASTNet Switch SMDR storage is enabled.

Section 5. Updating Multibase, Ebase, or TCBase

REPEATER CONFIGURATION

The Repeater Configuration also requires some reprogramming to become compatible with Fastbase and the Model 2540 Switch. The changes in the repeater configuration apply to processing of incoming and outgoing calls (see Figure 5-2). The following changes setup each Model 49/459 for multi-site FASTNet interface.

Model 49 Multi-Site Database Manager V6.20 (c)1990-98 Zetron (SUPERVISOR mode)

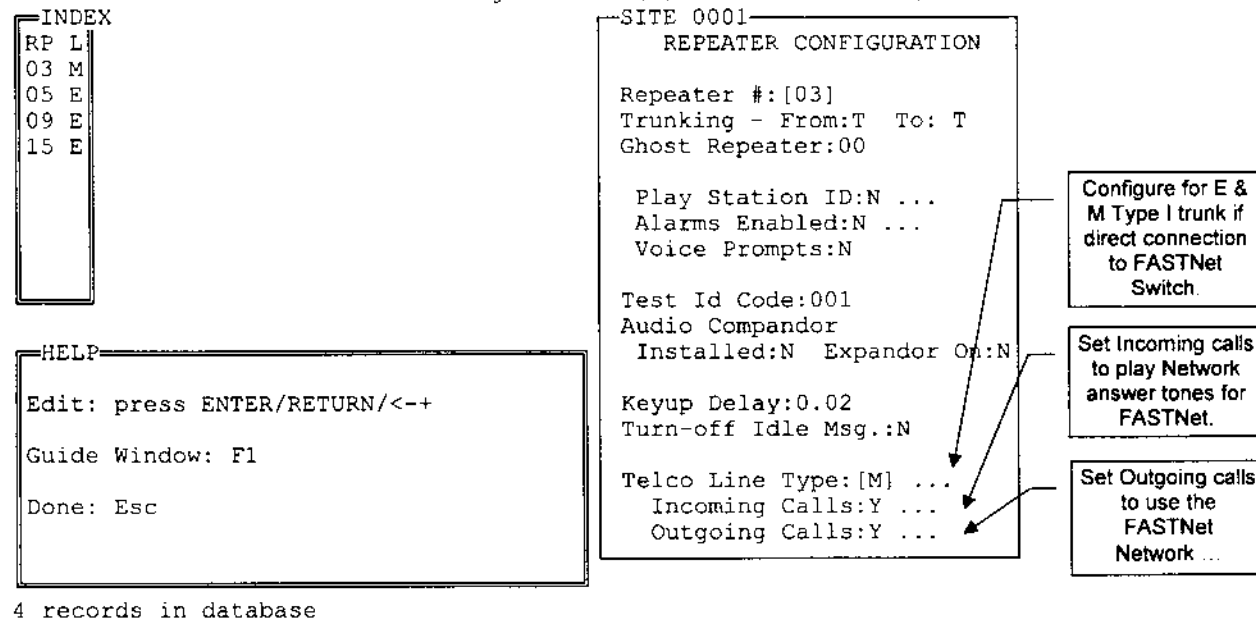


Figure 5-2. Ebase Repeater Configuration

Telco Line Type Fields

Enter an M in the Telco Line Type field to select an E & M 4-wire interface to the FASTNet Switch. The E & M window shown in Figure 5-3 appears.

```
E & M
Line Supervision Type: I
Signaling Type: D
Number of Feed Digits: 2
Line Description: N
```

Figure 5-3. E & M Window

Section 5. Updating Multibase, Ebase, or TCBase

The E & M window contains the following fields:

Line Supervision Type

This field selects the incoming supervision type for this line.

Enter a W for Wink start for direct connect. If connected via telco, use W or I depending on the telco protocol. The default setting is I for Immediate start.

Refer to the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260) for details.

Signaling Type

This field selects the type of signaling used by the FASTNet Switch to send the feed digits to the Model 49/459.

Enter a D for DTMF for direct connect. If connected via telco, enter D or P depending on the telco protocol. The default setting is D.

Number of Feed Digits

This field selects the number of feed digits the Model 49/459 expects from the FASTNet Switch or telco.

Enter 4 for direct connect. If connected via telco, enter 2 to 4 depending on how many digits telco is going to feed. The default setting 2.

Line Description

This field selects the type of E & M phone line.

Enter an N for FASTNet direct connection. The Model 49/459 disconnects on loss of loop current. The default setting is N.

Refer to the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260) for details.

Section 5. Updating Multibase, Ebase, or TCBase

Incoming Calls Fields

Enter a Y in the Incoming Calls field to enable the Model 49/459 to receive calls routed from the FASTNet Switch. The Incoming Calls window shown in Figure 5-4 appears.

```
INCOMING CALLS
Answer Mode:B
Timing
  Connect Time Required:0.10
  Delay Before Prompt:0.1
Play Network Answ. Tone:Y
```

Figure 5-4. Incoming Calls Window

The Incoming Calls window contains the following fields that need to be altered for FASTNet interface:

Connect Time Required

This field determines the amount of time (in seconds) the connect signal must be stable for the Model 49/459 to recognize the start of an incoming call. This field must be set less than 0.4 seconds for direct connection to the Model 2540.

For end-to-end trunks, enter 0.5 seconds. For E & M four-wire connections, enter 0.06 seconds. The default setting is 0.5 seconds.

Delay Before Prompt

This field sets the delay time (in seconds) between answering the line and playing the prompt. It is possible for the answer prompt to false a modem calling in to do programming. In such cases the delay before prompt should be set long enough to allow the Model 49/459 to detect modem carrier before is plays the prompt.

Enter .1 seconds. The default setting is 1.0 seconds.

Play Network Answ. Tone

The Play Network Answ. Tone field enables a DTMF tone that is played upon connection to the repeater. The tone indicates to the FASTNet Switch that the Model 49/459 has answered the incoming call.

Enter a Y to enable the tone. The default setting is Y.

Outgoing Calls Fields

Enter an Y in the Outgoing Calls field to enable the Model 49/459 to route outgoing calls to the FASTNet Switch. The Outgoing Calls window shown in Figure 5-5 appears.

Section 5. Updating Multibase, Ebase, or TCBase

```
OUTGOING_CALLS
Timing
Dial-Out Mode:1
Start Supervision Seek Time:03.0
Delay Before Dialout:0.0
Direct Link: S
Use FASTNet Switch: A
```

Figure 5-5. Outgoing Calls Window

The Outgoing Calls window contains the following fields that need to be altered for FASTNet interface:

Dial-Out Mode

This field sets the dialing mode for the Model 49/459.

Enter 1 for fast DTMF (@ 10 char/sec). The default setting is 0 for slow DTMF (@ 5 char/sec).

Start Supervision Seek Time

This field set the amount of time (in seconds) the Model 49/459 waits for supervision after the phone line is seized. For example, the amount of time to wait for dial tone. If the time limit expires and the repeater hasn't detected dial tone, it attempts to dial anyway.

Enter 3.0 seconds. The default setting is 3.



Note:

If Site Config data has the Require Dialtone field set to N, then the Model 49/459 dials anyway after time-out.

Delay Before Dialout

This field sets the amount of time (in seconds) that the Model 49/459 waits to dial out after detecting supervision.

Enter 0.0 seconds. The default setting is 0.

Direct Link

This field indicates whether the Model 49/459 is directly linked to another site or another piece of equipment. Usually this indicates that the Model 49/459 does not have to dial a phone number to connect to the other site.

Enter an S for connection to a FASTNet Switch. The default setting is N for No direct link.



Note:

If a FASTNet Switch is in use, but *this repeater is not* directly connected, the Direct Link field must be set to N.

Use FASTNet Switch

This field enables the repeater to connect to the FASTNet Switch.

Enter either A for All outbound calls or L for non-Local calls only. For direct connect, always enter A.

USER IDs PROGRAMMING

The User IDs also require some reprogramming to become compatible with Fastbase and the Model 2540 Switch. The changes in the User IDs apply to individual users at the repeater site(s).

Interconnect Fields

Each user must be setup for interconnect calls if the FASTNet Switch is used to route their calls. Enter an I for Interconnect or A for Auto-overdial in the LTR or ESAS User Type field to access the Interconnect window shown in Figure 5-6.

LTR_USER	
LTR User Type:	I ...
INTERCONNECT	
Class of Service:	...
Extended Type:	R ...
Ac	NETWORK
Phone Number: 8206363	

Figure 5-6. Ebase LTR™ User Interconnect Window

The Interconnect window contains the following fields that need to be altered for FASTNet interface:



Note:

The settings below are recommended for direct connection between the Model 2540 and the Model 49/459s or Uniden MRS804ZX repeaters, unless otherwise indicated.

Class of Service

In Ebase, the class of service called out by this user should include the following settings. (It might be easiest to create a new COS designed specifically for customers with FASTNet access). In Multibase and TCBase, class of services don't exist, so these fields reside within the Interconnect window.

<i>Toll Privileges</i>	<p>This field should be set to I for International long-distance calls allowed. This sets up the user to be able to dial any number they wish. Then the FASTNet Switch can determine and control all dialing privileges.</p> <p>If the Model 49/459 is not directly connected to the Model 2540, the repeater needs to supervise privileges itself. In this case, set the Toll Privileges accordingly.</p>
<i>Allow/Restrict Prefixes</i>	<p>Enter N to leave both groups A and B empty. (If altering an existing COS, enter Y to edit the tables.) The FASTNet Switch (not the directly connected Model 49/459) should perform the allowing and restricting tasks.</p>
<i>Roaming (Ebase only)</i>	<p>Enter a Y to enable this user to roam between repeater sites.</p>
<i>Network (Ebase only)</i>	<p>Enter a Y to enable this user to perform networked calls.</p>

Extended Type / Networking Type

This field selects the extended call type for the user. When a Model 49/459 sees a network Roamer enter its area, it has to report the FASTNet ID to the switch. The FASTNet Switch keeps track of the most current location of each FASTNet ID. The Model 49/459 also needs to know the FASTNet ID for each Dispatch network user.



Note:

In Multibase, the Networking Type field should not be set to C for Call forwarding if the user's calls are routed through the FASTNet Switch. The Model 2540 should perform any forwarding operations.

Enter either an R for FASTNet network Roamer or a D for Dispatch network. Another window appears as shown in Figure 5-6, prompting for the 7-digit network phone number. Enter a number that corresponds to the correct FASTNet Node User Phone Number.

Alternately, the user can be setup as push-to-connect, by entering a P in the Extended Type field. The PTC Users window shown in Figure 5-7 appears.

Section 5. Updating Multibase, Ebase, or TCBase

```
PTC_USERS
PUSH TO CONNECT USERS

Autodial Table Entry:[  ]
Time Allowed to Dial Manually:0
Type of Overdial:I
  Overdial - Id Code:[ - ]
                Access #:[  ]
```

Figure 5-7. PTC Users Window

Only the Autodial Table Entry field needs to be altered. This field indicates which autodial table entry to automatically call (setup in the Autodial Table programming).

LOCAL PREFIX TABLE PROGRAMMING

The Local Prefix Table is specifically designed for FASTNet interface with the Model 49/459 site. The table is used *only* if the Use FASTNet Switch field in the Repeater Configuration (see Figure 5-5) is set to L. This setting indicates that the repeater should route all calls that are not considered local to the Model 2540. The local prefix table determines which calls are considered local.



Note:

The Local Prefix Table does not apply if the Model 49/459 site is directly connected to the FASTNet Switch through a four-wire E & M link.

Refer to the *Model 49 Multibase Operation Manual* (Part No. 025-9297), the *Model 49 Ebase Operation Manual* (Part No. 025-9402), or the *Models 459 & 452 TCBase Operation Manual* (Part No. 025-9451) for details on how to program a local prefix table.

TEAMTALK DISPATCH CALL PROGRAMMING

If TeamTalk is used in the FASTNet Switch, some special settings are needed in Multibase, Ebase, or TCBase.

In the Site Configuration window, enter Y in the Interconnect field at the bottom of the screen.

In the Interconnect window, make the following settings:

<i>Mobile Turn-Around Time</i>	This field is for the maximum number of seconds allowed with no mobile keyed at the site. This inactivity setting is also programmed in the Fastbase TEAMTALK script parms field. Usually the setting in Multibase, Ebase, or TCBase is programmed longer so it acts as a failsafe.
--------------------------------	---

Section 5. Updating Multibase, Ebase, or TCBase

<i>Overdial Access #</i>	Enter Y for the fastest TeamTalk setup time.
<i>Repeat Audio Half-Duplex</i>	Enter N so the FASTNet Switch controls the audio. If more than one mobile keys up at more than one site, all group members, except those keyed up, hear the same audio.
<i>FASTNet Switch in Use</i>	Enter Y.

In the Repeater Configuration window, make the following settings:

<i>Telco Line Type</i>	Enter M for E&M.
<i>Incoming Calls</i>	Enter Y.
<i>Outgoing Calls</i>	Enter Y.

In the E&M window, make these settings:

<i>Line Supervision Type</i>	Enter W for wink start.
<i>Signaling Type</i>	Enter D for DTMF signaling.
<i>Number of Feed Digits</i>	Enter 4.
<i>Line Description</i>	Enter N for normal E&M.

In the Incoming Calls window, make the following settings:

<i>Answer Mode</i>	Enter B so the repeater answers and plays the RIC prompt.
<i>Timing – Connect Time Required</i>	Enter 0.20.
<i>Timing – Delay Before Prompt</i>	Enter 0.1.
<i>Play Network Answer Tone</i>	Enter Y.

Section 5. Updating Multibase, Ebase, or TCBase

In the Outgoing Calls window, make the following settings:

<i>Dial-Out Mode</i>	Enter 1 for fast DTMF dialing.
<i>Direct Link</i>	Enter S for a direct link to the FASTNet Switch.
<i>Use the FASTNet Switch</i>	Enter A for all calls.

In the User ID window, make the following settings:

<i>ID Type</i>	Enter A for auto-overdial.
<i>Access #</i>	Enter the site overdial number programmed in the Fastbase TEAMTALK script parameter.

In the Interconnect User Type window, make these settings:

<i>Full Duplex Radio in Use</i>	Enter N.
<i>Networking Type</i>	Enter N for none.

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6. BILLING AND STATISTICS

COMPUTER SETUP FOR BILLING

Billing files (for airtime, SMDR, etc.) can either be stored in the \FASTNET directory or in a separate directory named \BILL2540. The Fastbase Commnet / Retrieve sequence seeks out the \BILL2540 directory first, and if it is not found, downloads the billing information to the \FASTNET directory.

To create the directory follow the steps below.

1. Go to the root directory, by typing:

```
CD\ ↵
```

2. Create a new directory, by typing:

```
MD\BILL2540 ↵
```

Retrieving Billing Files

There are several steps involved in retrieving the billing data from the Model 2540. To initiate this process, invoke Fastbase and select Commnet / Retrieve from the main menu. Then choose either roaming User SMDR or SMDR file. After Fastbase establishes the communication link with the Model 2540, it gets the billing data in binary format from the Model 2540. This file with the binary billing data is stored in a subdirectory called "BINBILL" in the FASTNET directory. After this file is successfully retrieved from the Model 2540, the Model 2540 deletes the billing data from the Switch so that no billing data is duplicated. The Switch does not delete and re-initialize the SMDR records until the billing data is stored safely in the PC and verified.

When Commnet / Retrieve is selected from the menu, any binary files previously left in the "BINBILL" directory are converted first. Fastbase establishes the communication link with the Model 2540. The database then finds out how big the binary billing data is and checks the PC for adequate disk space. When there is sufficient disk space, Fastbase downloads the binary billing file to the computer. If there is not sufficient disk space, the process aborts.

The binary billing data in the "BINBILL" directory is named in the format:

```
MMDD###.B00
```

Table 6-1 explains the filename meaning.

Section 6. Billing and Statistics

Table 6-1. Billing Filename Fields

Identifier	Description
MM	the current month, with a leading zero as required
DD	the day of the month, with a leading zero as required
####	the four-digit node number
B	indicates that this is a binary file (this remains constant)
00	indicates that this is a billing file (this remains constant)

Fastbase converts the binary data to ASCII data. The ASCII file is named MMDD###.F00. The F indicates that this is a FASTNet ASCII file for billing use. The file is stored in the \BILL2540 directory. If the \BILL2540 directory does not exist, the \FASTNET directory is used. After the entire file is successfully converted to the ASCII format, the binary data in "BINBILL" is deleted.

Backing Up Billing Files

It is a good idea to backup retrieved billing records to floppy diskettes. This is especially important at the end of each billing cycle when the data is moved to the billing system for posting.

Before beginning a backup, prepare fresh diskettes with DOS compatible formatting information. Format enough blank diskettes (FORMAT A: from the DOS C> prompt) before starting the backup process to store all '.F00' files. The required disk capacity may be determined by typing "DIR C:\BILL2540\F00.*". A list of all '.F00' files in the BILL2540 directory is displayed with the total number of 'bytes' used by all of these files. Table 6-2 shows the approximate disk capacity for standard diskettes when storing FASTNet SMDR backup files.

Table 6-2. Diskette Capacities for SMDR Records

Diskette Size	FASTNet Records Capacity
5¼ inch, 360 KB	Approximately 6,000 Records
5¼ inch, 1.2 MB	Approximately 20,000 Records
3½ inch, 720 KB	Approximately 12,000 Records
3½ inch, 1.44 MB	Approximately 24,000 Records

To perform a data backup, select Backup / Fastnet from the main Fastbase menu. Then choose the appropriate type of backup. Follow the onscreen instructions.

It is also a good idea to put sticky labels on the diskettes that have the date and disk sequence number (FASTBASE M2540 SMDR - today's date - disk #n). As each backup diskette is removed from the computer, it is a good idea to "write protect" the diskette (black label covering the notch on 5¼-inch media; shutter open on 3½-inch media).

Fastbase gives precise instruction on when to insert the formatted floppy diskettes into the computer. Make a new set of backups for each week in the billing period. In this manner, archived data for billing is readily available, should the hard disk data become damaged.

Restoring Billing Files

If the database must be restored from backup diskettes onto the computer hard disk, use the Restore, Call Detail Records menu item. Fastbase gives precise instruction on when to insert backup diskettes into the computer. Be sure to insert the *correct set* of backups, and in the *correct order*. Before inserting each backup diskette into the computer, it is a good idea to "write protect" the diskette (black label covering the notch on 5¼-inch media; shutter open on 3½-inch media).

CALL DETAIL (SMDR) RECORDS

Call Detail records contain specific interconnect details for each of the trunked phone calls processed by FASTNet. These include, but are not limited to: the FASTNet ID code (phone number), call status (normal call, pager, voice message, etc.), time and date of call, length of call, and whom initiated the call (land or mobile). These records are typically used for customer billing and/or trunk troubleshooting when needed.

Call Detail File Format

Telephone call detail information collected by the Model 2540 is stored as ASCII files on the PC hard disk in the directory named \BILL2540, or if there isn't one, in the directory that Fastbase is in. Once loaded into your computer, Zetron's software billing package ZEBRA can take this ASCII data and create billing information.

The ASCII data can be used for an alternate billing system, as well. The FASTNet Call Detail files start with a header record identifying the node, date, time of day, etc. The data records follow the header record and are sorted chronologically. Each data record is the same fixed number of bytes in length and corresponds to a single telephone call handled by the Model 2540. Data for each node is contained in a separate file.

If an error occurs when retrieving the information, such as an interruption of the modem call, the information still exists on the Model 2540. By selecting Retrieve from the CommNet menu, the process is restarted. If there is insufficient disk space, Fastbase displays an error. At this point, make room on the disk and restart the process.

Section 6. Billing and Statistics

A sample Call Detail file is provided in Figure 6-1 and Figure 6-2. The same sample file is used for both illustrations, and is composed of one "Header" line and three "SMDR Data" ("Call Detail") lines. Figure 6-1 highlights each of the fields in the header line of the ASCII SMDR file and provides a brief description of each. Figure 6-2 illustrates each of the fields for the SMDR data lines of the file. In both figures, the number of characters in each field is specified, with a brief description of each field.

5 char. 4 char. 1 character F = FASTNet					1 character Processed Flag				
Zetron Model ID	Node No.	"Start" Date (This file)	"Start" Time of Day (This file)	"End" Date (This file)	"End" Time of Day (This file)	No. of Records In File	Spare	CR & LF	
M2540	001F	03/22/90	15:06:39	03/22/90	15:33:48	3			
0017372000C	0L15:11	200				17A20B	03/22/93		
0017372010C	0M15:13	1808206363				20A10A	03/22/93		
0017372322N	10L15:13	0				17B19B	03/22/93		
(etc. for more data records sorted chronologically...)									

Figure 6-1. FASTNet SMDR ASCII Format - Header Line

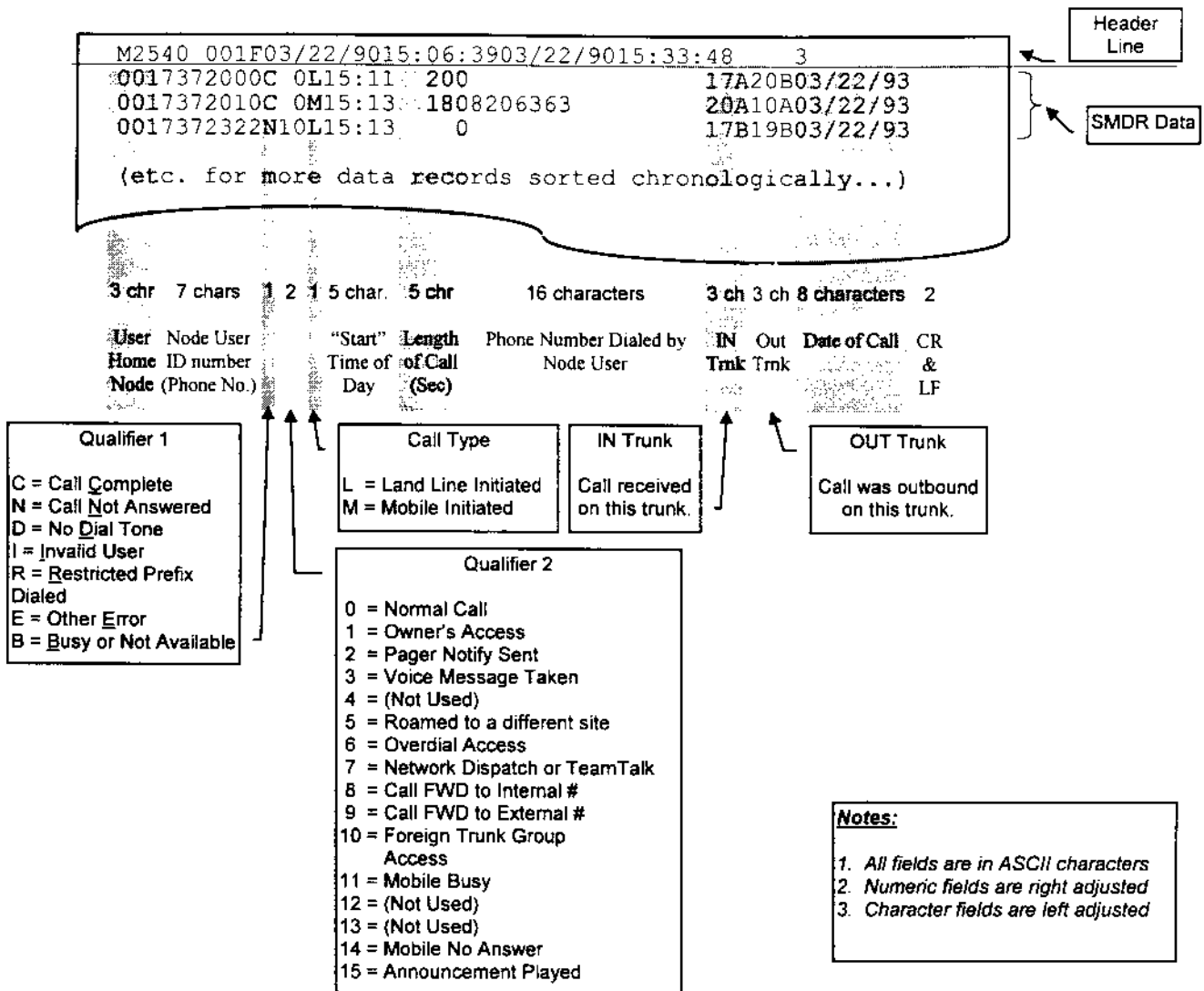


Figure 6-2. FASTNet SMDR ASCII Format - Call Details

SMDR File Header

The header line is 60 ASCII characters in length, broken down as follows:

- 5 characters: Identifies Zetron Equipment Model.
- 4 characters: Identifies FASTNet Node where file was retrieved from.
- 1 character: F indicates this is a FASTNet SMDR file.

Section 6. Billing and Statistics

- 8 characters: Lists the date which this file was started as MM/DD/YY,
Where:
MM = Month (01 ... 12)
DD = Day (01 ... 31)
YY = Year (95, etc.)
- 8 characters: Time of day when file was started on the above date, HH:MM:SS
Where:
HH = Hours expressed in *military* time (01 ... 24)
MM = Minutes (01 ... 59)
SS = Seconds (01 ... 59)
- 8 characters: Lists the date when this file was closed, as MM/DD/YY
(Similar to Start Date)
- 8 characters: Time of day when file was closed on above date, HH:MM:SS
(Similar to Start Time)
- 5 characters: Number of SMDR records stored in this file (Max = 99999).
- 1 character: "Processed Flag" ... Not currently used.
- 10 characters: Spare ... Not currently used.
- 2 characters: ASCII Carriage Return (↵) and Line Feed.

Further illustration of this first line from the ASCII FASTNet SMDR file is provided in Figure 6-1.

SMDR File Data Lines

The data lines are each 56 ASCII characters in length, broken down as follows:

- 3 characters: Lists the Home Node for the user described on this line.
- 7 characters: FASTNet Node User ID number (FASTNet Phone Number).
- 1 character: Qualifier #1; Provides call termination status for this call.
C = Completed Call (normal)
N = Not Answered
D = Dial Tone Not Detected, call terminated.
I = Invalid Node User ID, call terminated.
R = Restricted Prefix Dialed, call terminated.
B = Busy or Not Available Trunk, call terminated.
E = Error other than above, call terminated.

- 2 characters: Qualifier #2; Provides call initiation status for this call.
 - 0 = Normal Call
 - 1 = Owner's Access
 - 2 = Pager Notify Sent
 - 3 = Voice Message Taken
 - 4 = (Not currently used)
 - 5 = Roamed to a Different Site
 - 6 = Overdial Access
 - 7 = Network Dispatch Call or TeamTalk Call
 - 8 = Call Forward to Internal Number
 - 9 = Call Forward to External Number
 - 10 = Foreign Exchange Trunk Group Access
 - 11 = Mobile Busy
 - 12 = (Not currently used)
 - 13 = (Not currently used)
 - 14 = Mobile No Answer
 - 15 = Announcement Played
- 1 character: Call Type; L = Landside originated call
 M = Mobile originated call.
- 5 characters: Time of day (*military*) when this call started, HH:MM.
- 5 characters: Time duration (length) of the call in seconds.
 (maximum 9999 seconds = 27 hours, 46 minutes, 39 seconds)
- 16 characters: Telephone number dialed by Node User to initiate this call.
- 3 characters: FASTNet trunk which *received* this call.
- 3 characters: FASTNet destination trunk which this call *connected to*.
- 8 characters: Date this call was placed, MM/DD/YY.

Where:

MM = Month (01 ... 12)
 DD = Day (01 ... 31)
 YY = Year (95, etc.)

- 2 characters: ASCII Carriage Return (↵) and Line Feed.

Further illustration of the data lines from the ASCII FASTNet SMDR file is provided in Figure 6-2.

Section 6. Billing and Statistics

NODE USER RECORDS

An additional file contains information from the Node User configuration that is useful to identify billing data for each user. The file is named in the format:

MMDD###.NU0"MM

The name is identical to the Call Detail filename (see Table 6-1), except NU0 identifies this file as a User file for the billing data.

Refer to Figure 6-3 for a file sample. The user file shown is in ASCII text format. It is organized similar to the call detail file, with one "Header" line and many data lines following (one per Node User).

```
M2540 001N 18
0000335NSITE 2 03/28/9503/30/95N
0002020NSITE 2 03/14/9503/15/95N
0002021NSITE 2 03/14/9503/14/95N
0006060NMAILBOX 03/14/9504/03/95N
0006363N 02/27/9503/15/95N
0006364NGREG'S MOBILE 02/27/95 / N
0006365SMODEM M49 02/27/95 / N
0006669N 03/31/9503/31/95N
0007070NTEST M 48 02/27/9503/10/95N
0016363NGREG 810 TEST 02/27/95 / N
1000000SPROCESS 49 COMMANDS 02/27/95 / N
1000001SPROCESS 49 DIAL UP 02/27/95 / N
1000002SGET OVER DIAL DIRECT 02/27/95 / N
1000003SGET OVER DIAL NORMAL 02/27/95 / N
1000004S 02/27/95 / N
1000005S 02/27/95 / N
1000009S 03/17/9503/17/95N
8216363N 02/27/95 / N

C:\BILL2540>
```

Figure 6-3. Node User File Sample

User File Header

The User File Header has the following format: (28 characters long)

- 5 characters: Lists Zetron Equipment Model Number (FASTNet = 2540).
- 4 characters: Node Number which contains the following ID Codes.
- 1 character: N indicates this is a Node User File.
- 5 characters: Indicates the total number of Node User records stored in this file.
- 1 character: "Processed Flag" is currently not used.
- 10 characters: Spare ... not currently used.
- 2 characters: Carriage Return (↵) and Linefeed.

User File Data Lines

Each User Data Record line of the Node User file contains 65 characters total and has the following format:

- 7 characters: Lists FASTNet Node User ID Code (Phone Number).
- 1 character: User Type
 - N = Network User
 - D = Network (Wide Area) Dispatch
 - S = Script is Invoked
- 20 character: User's Name
- 10 characters: Account Code
- 5 characters: Billing Rate Code
- 8 characters: MM/DD/YY User Record was created.
- 8 characters: MM/DD/YY User Record last altered.
- 1 character: Bill as Duplicate ? (Y/N)
- 3 characters: Number of Mobiles sharing this FASTNet Node User ID Code.
- 2 characters: Carriage Return (↵) and Linefeed.

BILLING DATA TRANSFER FOR ACCOUNTING

Air time usage and call detail data may be transferred into any preferred accounting program. The billing data is stored into MS-DOS compatible sequential data files in ASCII format.

The files should reside in the "BILL2540" directory, unless the system operator has specified otherwise.

Billing Data Summary

FASTNet Call Detail (SMDR) records are ultimately stored in ASCII files named MMDD###F00, where "###" is the Node (FASTNet Switch) Number from which the data was downloaded.

Once the MMDD###.B00 files are found, refer to "CALL DETAIL (SMDR) RECORDS" on page 6-3 to finish downloading the SMDR billing from the node. The database then generates the required ".F00" files.

A User ID file named MMDD###.NU0 contains information from the FASTNet Node User ID file that is useful for billing. This file equates User ID codes for the associated 'FASTNet Node' ".F00" files to User Type, User Name, Customer Account Code, Billing Rate Code, and other parameters which were previously defined for each FASTNet Node Number (###).

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7. TRUNK CARD EDITOR

WHAT IS THE TRUNK CARD EDITOR?

The Trunk Card Editor (henceforth referred to as the TCE) provides a windowed interface, in the same manner as Fastbase, to help configure the Model 2540's system and trunk card parameters. The TCE is used less frequently than Fastbase since it primarily provides *hardware configuration* support. The TCE accepts various parameters reflecting the current configuration. The TCE uses the parameters to generate configuration files for the Model 2540. These files may be imported into the TCE's database or verified against a node in the database. Configuration information can be saved for more than one switch, or for alternate applications - ready for instant retrieval.

The files generated by the TCE can be printed to a hardcopy or file for analysis and system management.

SHARED FILES BETWEEN TCE AND FASTBASE

If TCE is installed into the Fastbase directory, TCE can use the COLOR.ZBS file for color screen configuration and serial communication port settings. TCE also uses the same passwords as Fastbase. Thus, if the user passwords in the TCE are changed, they also change in Fastbase, and vice versa.

Regarding Fastbase and TCE, the access password for the FASTNet Switch is stored in *separate* file databases. Subsequently, the FASTNet Access password *must* be set/changed to the same value in both programs separately.

RUNNING TCE

To invoke the TCE program:

- ☐ 1. Go to the directory of the computer where TCE has been installed.
default directory = TCE
- ☐ 2. Type "TCE_␣" to start the program.

If TCE was installed for the first time, first put a dummy node into the database. The dummy node needs to contain the comm port and serial baud rate. Then verify the ability to connect to the switch by selecting Comm / Monitor (TCE must connect to a node to proceed further).



Note: (Do this before all else!)

Select **Commnet / Retrieve / To Database** to load the *factory system configuration* into the TCE database. Save this data in “back-up” for future reference, if needed.

PASSWORD ACCESS IN TCE

Accessing program functions via user passwords is similar to Fastbase operations, except that user-accesses to the menu follow the hierarchy shown in Table 7-1. Password levels 2 and 3 are not used by TCE and are therefore ignored if an attempt is made to use those passwords to access TCE functions. Level 0 security equates to NO password required.

Table 7-1. TCE Programming Access Levels

Main Menu	Sub Menu 1	Sub Menu 2	Password Level		
			0	1	2
Edit	Nodes			✓	✓
	Trunk Groups			✓	✓
	Cards			✓	✓
Files	Generate			✓	✓
	Import			✓	✓
	Verify			✓	✓
Comm	Update			✓	✓
	Retrieve			✓	✓
	Monitor		✓	✓	✓
	Other	Change Password		✓	✓
Print	Nodes			✓	✓
	Trunk Groups			✓	✓
	Cards			✓	✓
Backup	Config Data			✓	✓
Restore	Config Data				✓
Other	Change PC Modem Params				✓
	Change TCE Password			✓	✓
	Exit		✓	✓	✓

MENUS

Once TCE is started, use the arrow keys (←, ↑, →, and ↓) to highlight the menu items and press <Enter> (↵) to select the menu item. The TCE main menu screen is shown in Figure 7-1.

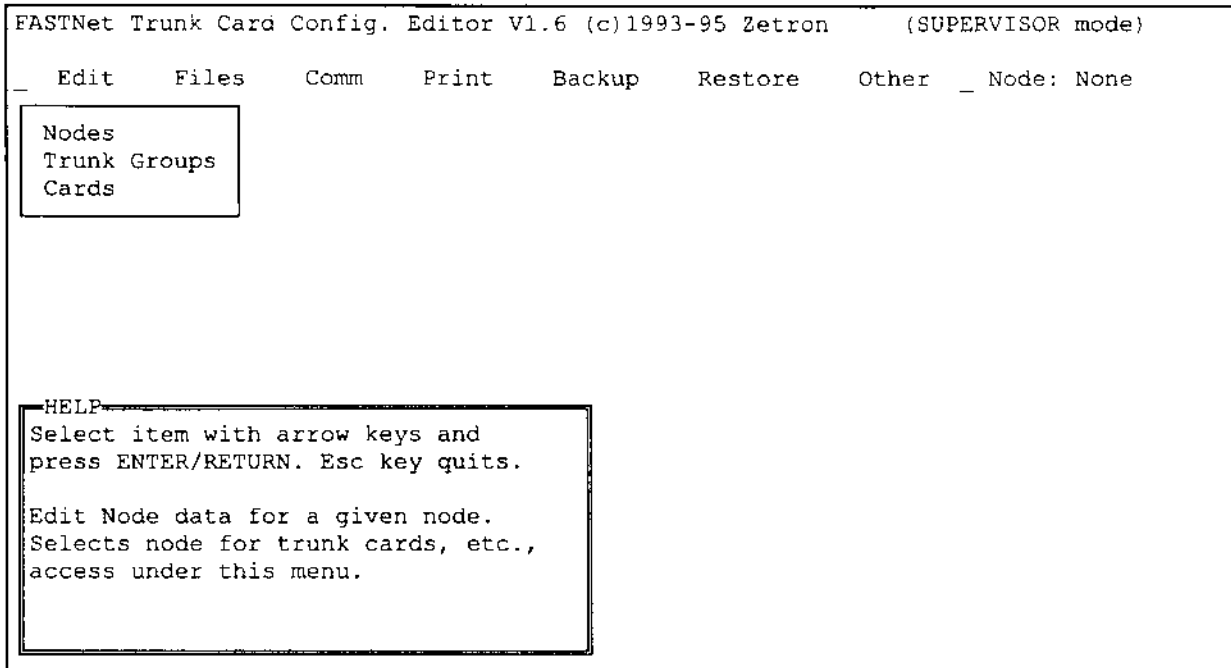


Figure 7-1. Main Menu

The Level 1 submenu items for each Main Menu item are listed below.

Edit Menu

The Edit menu is used for adding and changing the system parameters. The following choices are available in the editing menu:

- Nodes
- Trunks
- Cards

Files Menu

The Files menu is used for importing and exporting the five different system configuration files. The following choices are available in the files menu:

- Generate
- Import
- Verify

Section 7. Trunk Card Editor

Comm Menu

The Comm menu is used to communicate with the FASTNet Switch. The following choices are available in the communication menu:

- Update
- Retrieve
- Monitor
- Other

Print Menu

The Print menu creates hardcopies of the database information. The following choices are available in the printing menu:

- Nodes
- Trunks
- Cards

Backup Menu

The Backup menu saves the database contents to floppy disk. The following choice is available in the backup menu:

- Config Data

Restore Menu

The Restore menu retrieves backup database information from floppy and loads it into the Model 2540. The following choice is available in the restore menu:

- Config Data

Other Menu

The Other menu performs miscellaneous TCE functions. The following choices are available in the other menu:

- Change PC Modem Parameters
- Change TCE Password
- Exit

TCE GUIDE WINDOWS

The TCE supports the <F1> guide window function key. As with Fastbase, Multibase, and TCBase, the TCE Guide Windows are active only when an "Index" window is active in a subdirectory. The hot-keys provided by the TCE are nearly identical to those provided by Fastbase (see Table 3-1). The TCE does provide a method of creating multiple cards and groups using the <F5> key as a copy function.

The <F1> "GUIDE" window is shown in Figure 7-2.

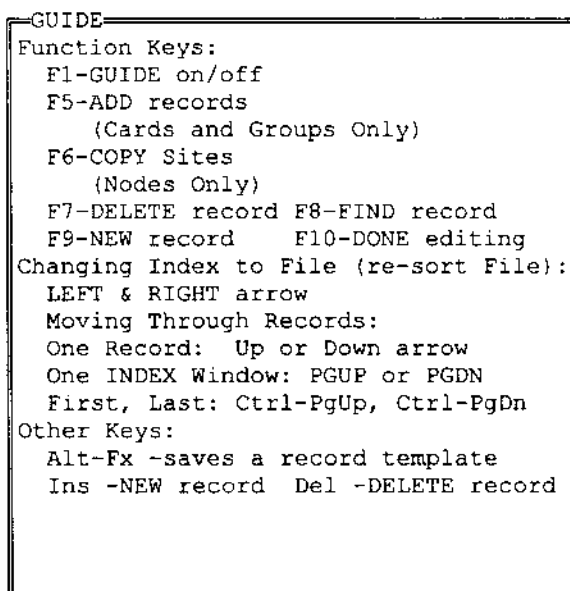


Figure 7-2. Index Guide Window

SYSTEM CONFIGURATION FILES

Model 2540 parameters are initially configured by Zetron at the factory using the TCE. Typically, an engineer enters the system specifications into the TCE's database and then updates the switch settings. In this process, five ASCII files are generated and downloaded to the switch:

- ☐ OPARAM.CDS Contains *Trunk Card* configuration and operational parameters.
- ☐ TRUNKS.CUS Contains *Trunk Group* specifics, customized per node application.
- ☐ OPTIONS.CUS Contains *System* configuration.
- ☐ CONFIG.CDS Defines which software to load into trunk cards.
- ☐ PARAM.SYS Contains system-specific information.

See Section 10 for more specific information on these files. The configuration files are read by the switch's processor and most parameters are set after download. Certain parameters require a reboot of the switch to take affect. The TCE provides some range checking, but

Section 7. Trunk Card Editor

certain configurations may result in errors, so watch the Status window when downloading for potential configuration problems (These would typically occur during the “Set” phase. One condition which would be likely to cause errors is attempting to program a card which doesn’t exist).

The last two files, CONFIG.CDS and PARAM.SYS , are ASCII configuration files and contain relatively stable system information. These two files are configured at the factory and rarely need to be changed. *Improper alteration of these files may result in an inoperative switch.*

NODE CONFIGURATION

The TCE allows a system to be configured through a window-based field entry method much like Fastbase. There is one very significant difference in operation compared to Fastbase: Once a node is selected from the list, it becomes the *active* node for all but the Files / Verify menu. The active node is listed at the right end of the menu bar. This feature allows easier menu navigation without having to select the node each time a menu is selected.

To select a new “active” node, select Edit / Nodes from the menu and press Enter (↵). Use the (↑) and (↓) keys to select a node and press Enter (↵), which causes the cursor to jump to the System Data window. The index and data screens which pop-up are shown in Figure 7-3, for the Edit / Node menu. When <Esc> is pressed to exit the Nodes menu, the selected node remains active until re-selected, or the TCE is closed.

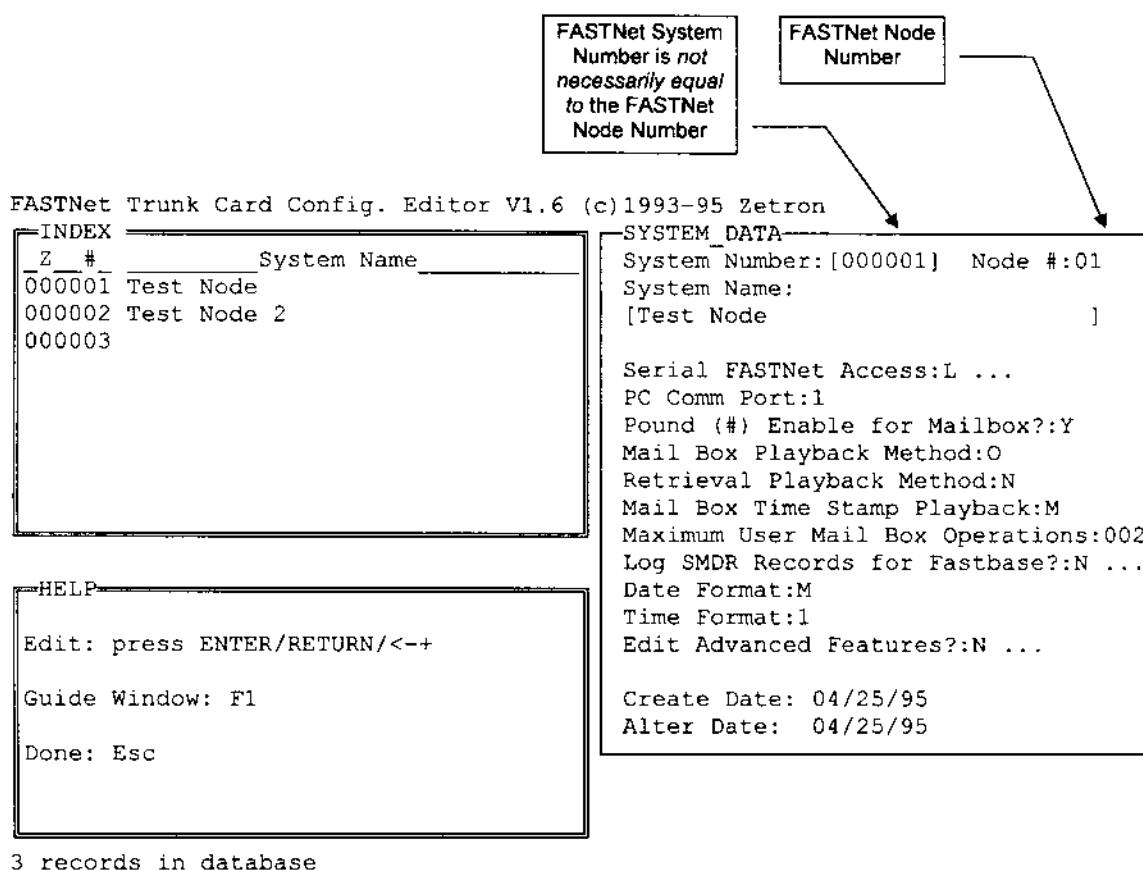


Figure 7-3. Node Configuration Screen

TCE System Data Configuration

The following explanation of entering appropriate field values can be used as a guide for configuring a system from scratch or as a reference. TCE screens have been included with current topics highlighted. This information is presented from the left main menu item on the computer monitor screen to the right item, and from the top the field of the main detail

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window to the last field, exploring linked pop-up windows in sequence. This linear approach helps to find the topic of interest faster when thumbing through this manual. Note that most of these features relate directly to the advanced information in Section 10. As in Multibase, Ebase, TCBase, and Fastbase, the TCE uses ellipses (“...”) to indicate a field selection that brings up a linked subwindow.

Initial Configuration

If configuring a system from scratch, select Edit / Nodes from the TCE main menu and choose a node. Refer to the callouts of Figure 7-3 for location of the fields.

System Number

Enter a FASTNet System (Node) number in the System Number field.

Enter a number between 0 and 999999. There is no default setting for this field.



Note:

The FASTNet System (Node) number may not be the same as the Node Number used in Fastbase. The Fastbase node number is entered into the Node # field.

System Name

Enter a descriptive name for the system to be configured in the System Name field.

Enter a text string up to 31 characters in length. There is no default setting for this field.

Serial FASTNet Access

The Serial FASTNet Access field tells the computer how to attempt communications with the Model 2540. If connecting directly to the switch, enter an L for Local programming. A list box appears, from which to choose various local serial interface baud rates. Select the appropriate baud rate. If connecting through a modem to the Model 2540, enter an M and the Modem window shown in Figure 7-4 appears.

The Modem window contains the following fields:

<i>Phone #</i>	This field tells the computer what phone number (dialing string) it should use to access the Model 2540 for programming.
<i>PC Modem Baud Rate</i>	This field tells the computer the baud rate at which to communicate with the FASTNet Switch for programming.

SYSTEM DATA
 System Number: [000002] Node #:
 System Name:
 [Test Node 2]

Serial FASTNet Access:M ...

PC MODEM

Phone #:987 6543

PC Modem Baud Rate:9600

Mail Box Time Stamp Playback:M

Maximum User Mail Box Operations:002

Log SMDR Records?:N ...

Log SMDR Roaming Records?:N ...

Date Format:M

Time Format:1

Edit Advanced Features?:N ...

Create Date: 04/25/95

Alter Date:

Selecting "M" causes the MODEM pop-up menu to appear.

Enter the telephone/modem number for the PC Modem to dial to reach FASTNet.

Select the Baud Rate for the PC Modem to use for the FASTNet Switch.

Figure 7-4. Modem Window

PC Comm Port

The PC Comm Port field selects which serial communication port the office computer uses to connect to the Model 2540 for programming.

Enter the COM port number from 1 to 4. The default setting is COM1.

Pound Enable for Mailbox

Referring again to Figure 7-3, enter N for Pound Enable for Mailbox field if the FASTNet Switch is connected to Model 49/459s. Enter Y to allow users to stop mailbox message playback with the phone's pound (#) key.

The default setting for the Pound Enable field is Y.



Note:

The Model 49/459 normally terminates the interconnect call if the mobile user keys a “#” during conversation. The Model 49/459, however, is programmed with a solution to this situation:

1. The mobile user can press “*” to toggle the pound detector to OFF. The Model 49/459 acknowledges with a return prompt of four low-frequency tones.
2. After completing the voice messaging business, the mobile user can then press “*” to toggle the pound detector back to ON.
3. The mobile user can then disconnect the interconnect call in the usual manner - “#”.

Mailbox Playback Method and Retrieval Playback Method

For Mailbox Playback Method and Retrieval Playback Method, select either the “O” (Oldest First) or “N” (Newest First) playback method. Usually Mailbox messages are played oldest first and Retrieval are played newest first. Refer to Figure 7-3 for a view of the screen from which these are chosen.

The default settings are O for the Mailbox Playback Method and N for the Retrieval Playback Method.

Mail Box Time Stamp Playback

The system supports three different techniques for hearing the time stamp of mailbox messages:

1. Manual; user must press “8” to hear the time of each message,
2. Before; plays the time automatically before each message is played, and
3. After; plays the time after each message is played.

Enter the first letter of these types for the desired operation into the Mail Box Time Stamp Playback field. The default setting is M - manual.

Maximum User Mail Box Operations

The Maximum User Mail Box Operations field sets the maximum number of interactions the user may have while accessing their mailbox. If you wish to limit the user’s access of the mailbox feature, set this number somewhere between two and five.

Enter a number between 1 and 255. The default setting is 2.

Log SMDR Records

Set the Log SMDR Records field to 'Y' if it is desired to record call details via FASTNet SMDR records, *and* enter into the pop-up window the time duration in seconds which must lapse before each call is recorded as an SMDR record. For typical billing purposes, this number is set to 30 seconds. Choosing to use SMDR records requires additional system disk space, which is dependent upon call frequency.

Y (es) and N (o) are the only entries available. The default setting is Y.

Log SMDR Roaming Records

Set this field to 'Y' if call detail records should be recorded for network roamer calls on the FASTNet Switch.

Y (es) and N (o) are the only entries available. The default setting is N.



Caution:

Absolutely No SMDR records are stored if Log SMDR Records and Log SMDR Roaming Records are set to N and one of the following is also true:

- 1. The Model 49 units connected to the FASTNet trunks are not equipped with optional SMDR firmware. (A Model 498 for ESAS™ systems.)**
- 2. The SMDR records are disabled in the Model 49/459 units by setting the Store SMDR Recs FASTNet Calls field to N in Multibase/Ebase/TCBase Site Config.**

Date Format

The Date Format determines the order in which the time and date are announced. The following settings are available:

D	Day, then month
M	Month, then day

The default setting for the Date Format is M - month first, followed by the day.

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Time Format

The Time Format field determines the format in which the time is announced. The following settings are available:

- | | |
|---|---------------------------|
| 1 | 12-hour format with am/pm |
| 2 | 24-hour (military) format |

The default setting for the Time Format is 1 - 12-hour format.

Advanced Node Configuration

The Model 2540 supports additional features which allow customization and fine tuning of the system operation. These features are setup with default values from the factory, and are accessible by entering Y in the Advanced Features field. Figure 7-5 illustrates the additional fields available for the advanced features.

```
FASTNet Trunk Card Config. Editor V1.6 (c)1993-95 Zetron      (SUPERVISOR mode)
```

<pre>INDEX Z # System Name 000001 Test Node 000002 Test Node 2 000003</pre>	<pre>SYSTEM_DATA System Number:[000001] Node #:01 System Name: [Test Node] Serial FASTNet Access:L ... PC Comm Port:1 Pound (#) Enable for Mailbox?:Y Mail Box Playback Method:0 Ret ADVANCED Mai Set ADPCM card parameters?:Y ... Max Log File size:20000 Log Number of Log Files:020 Dat Use Logging Printer?:N ... Tim Traffic Filter Type:A ... Edi Total PCM Paths:48 Minimum Voice Threshold:03 Cre Minimum Prompt Duration:02 Alt Custom Page Tasks?:N Set Modem Port?:N ... Set Local Port?:N ... Edit Mastercard Modem?:N ... Enable Forwarding Beeps?:Y</pre>
--	--

<pre>HELP Choose 'Y' to set values for silence deletion and voice threshold levels. Used with voice messaging systems only. Allows optimization of voice storage requirements.</pre>
--

Figure 7-5. Advanced Features Window

Set ADPCM Card Parameters

When the set ADPCM card parameters? field is set to Y, the window shown in Figure 7-6 appears. The Voice PT window configures voice message format, as stored on the hard disk.

ADVANCED	
Set ADPCM card parameters?:Y ...	
Lo VOICE_PT	
Nu Silence Duration:012	
Us Silence Level:00200	
Tr Voice Channels:4	
To Voice Image Version:12	
Mi Voice Card Language:english	
Mi	
Custom Page Tasks?:N	
Set Modem Port?:N ...	
Set Local Port?:N ...	
Edit Mastercard Modem?:N ...	
Enable Forwarding Beeps?:Y	
Network Dispatch Tasks:03	

Figure 7-6. ADPCM Voice Window

If the Set ADPCM card parameters field is set to N, all the parameters are set to default values.

The Voice PT window contains the following fields:

Silence Duration While the ADPCM Card is processing message recording, speech gaps may be encountered. A speech gap is any inbound audio with a signal amplitude lower than the Silence Level setting. Gaps longer than the Silence Duration setting cause a pause in recording. Recording resumes when the inbound audio exceeds the Silence Level. If the speech gap continues, the system times out and terminates the call and message.

During playback of the message(s), the original speech gaps are re-inserted.

The Silence Duration sets the minimum length of time (in $1/16$ -second intervals) that is considered a gap between words. For example, if '8' is entered, then the silence duration is $8 \times 1/16 = 0.5$ second.

The Silence Duration should be between 0 and 255 ($1 = 1/16$ of a second). The typical range used is 24 to 100. The default setting is 24 (= 1.5 seconds).

Silence Level

The Silence Level sets the signal amplitude threshold that divides speech from silence. This parameter and the Silence Duration are used to delete inbound audio silent spots between speech words and syllables. The ADPCM Card then compresses the speech bursts together to form a continuous signal for hard disk storage. A lower number yields fewer deletions whereas a higher number causes 'chopped' audio.

The Silence Level should be between 0 and 65,000. A setting of 0 is recommended. The typical range used is 0-100. The default setting is 200.



Note:

Before resetting the Silence Duration or Silence Level parameters, Zetron recommends careful re-examination of the trunk card level adjustments. Low audio levels may affect the operation of these parameters.

Voice Channels

The Voice Channels field defines the number of ADPCM voice channels FASTNet uses to convey speech into and out of voice storage. The ADPCM card is shipped from Zetron equipped with hardware for four (4) voice storage/retrieval channels. Additional voice channel hardware options can be purchased, four channels per installation, up to a maximum of sixteen ADPCM channels. This entry must correspond with installed hardware. This parameter is stored into the PARAM.SYS file, and is therefore only read by FASTNet following a reset.

The Voice Channels field should be set to the number of installed ADPCM channels (4, 8, 12, or 16). The default setting is 4.

*Voice Image
Version*

The Voice Image Version is the VOX firmware version which is installed into the ADPCM Card. This parameter is stored into the PARAM.SYS file, and is therefore only read by FASTNet following a reset.

This field is preset at the factory.

*Voice Card
Language*

The Voice Card Language field at the time of this manual's printing can be set to one of two options: English or Spanish. Both sets of prompts reside on the FASTNet hard drive, so that either can be enabled at any time. This parameter is stored into the PARAM.SYS file, and is therefore only read by FASTNet following a reset.

The default setting is English.

**Note:**

It is strongly recommended that Voice Channels, Voice Image Version, or Voice Card Language parameters *not be altered* without the help of Zetron applications engineers.

Log File Size

The Log File size field sets the maximum length (in bytes) of each log file stored in memory. The log files store each call placed through the FASTNet Switch. Log files are useful for monitoring all system activity and aid in system management.

Enter the file size as a number between 1 and 65,000 bytes. The default setting is 20,000 bytes.

Number of Log Files

The Number of Log Files field sets the total number of log files that the system stores. If this field is set too large, the log files may consume too much disk space, slowing system performance. Once the maximum is reached, a new log file replaces the eldest file in memory.

Enter the maximum number of log files the FASTNet Switch should store as a number between 2 and 100. The default setting is 20 files.

Use Logging Printer

The Use Logging Printer field indicates whether the local printer option is installed in the Model 2540. When a Y is entered, the window shown in Figure 7-7 appears.

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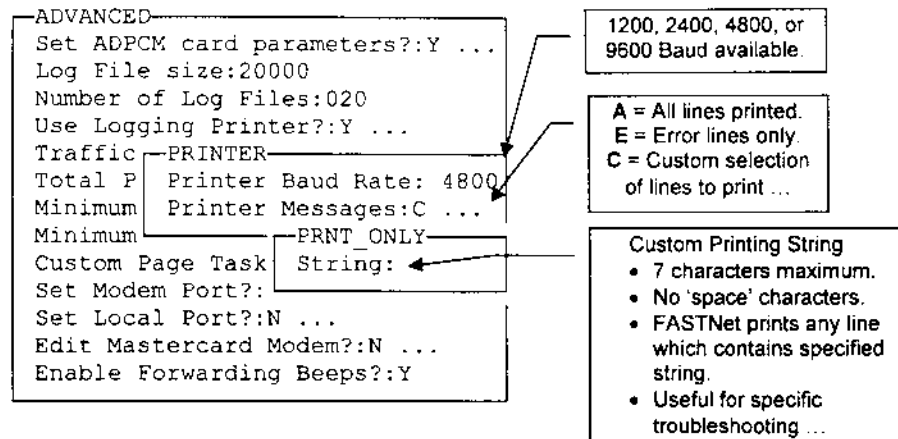


Figure 7-7. Local Logging Printer Window

Y (es) and N (o) are the only available entries for the Use Logging Printer field. The default setting is N.

The Printer window contains the following fields:

Printer Baud Rate This field selects the communications rate at which data is sent to the logging printer. Select a baud rate from the choices provided (1200, 2400, 4800, 9600). Use a 4800 baud or faster printer to reduce the processing load on the FASTNet Switch and improve overall system operations.

The default setting is 4800 baud.



Note:

If the Baud Rate is set lower than 4800 baud, system performance may be degraded.

- Printer Messages* This field tells the Model 2540 which types of messages to send to the printer. The available settings are:
- A - print All messages
This setting requires lots of paper, but is good for debugging.
 - E - print Error logging
This setting only prints errors encountered.
 - C - enter a Custom string
The Print Only secondary window shown in Figure 7-7 appears. A 7-character field is provided for entry of a contiguous character string - no 'spaces' allowed. FASTNet scans each logging line for this sequence of characters, and prints any line containing the custom character string.
- The default setting is A.

Traffic Filter Type

The Traffic Filter Type field is configured in exactly the same manner as the Printer Messages. Select the appropriate message types to display to the system's monitor screen (Netview).

The default setting is A so that all messages are displayed.

Total PCM Paths

The Total PCM Paths field defines the number of PCM paths used in the Model 2540 to convey the digitized voice signaling between trunk cards and/or the ADPCM Card (voice storage). This parameter is only read when the switch is rebooted.

The 20-trunk FASTNet Systems, equipped with one Model 2540 main chassis, and the 40-trunk systems (additionally equipped with one Model 2540 Expand Chassis) utilize both backplane PCM busses, at 24 paths each, for a total of 48 paths. Each of the trunk cards must have JP1 *removed* for 24-path bus compatibility.

The 60-trunk FASTNet Systems is equipped with a 386-PC controller card in the main chassis, plus two expand chassis. This configuration utilizes both PCM busses, at 32 paths each, for a total of 64 paths. Also, each of the trunk cards must have JP1 *installed* for 32-path bus compatibility.

For either of the above configurations, a minimum of four channels are reserved for ADPCM traffic to/from voice messaging. Additionally, six channels are reserved for continuously generated prompting tones from the CPU card (1 kHz "beep", "out of service" whoop, telco "dial tone", telco "ringing" tone, telco "busy" tone, and a "silent" tone). This leaves a remaining total of 38 or 54 PCM paths to convey interconnect traffic conversations.

Section 7. Trunk Card Editor

Enter the number of paths as 24, 48, or 64. The default setting is 48.

Minimum Voice Threshold

The Minimum Voice Threshold field defines the minimum time duration required for voice *messages* to be stored. Voice messages shorter than the minimum are not recorded.

Enter a minimum voice message length between 0 and 15 seconds. The default setting is 3 seconds.

Minimum Prompt Duration

The Minimum Prompt Duration field defines the minimum time duration required for voice *prompts* to be stored. Voice prompts shorter than the minimum are not recorded.

Enter a minimum voice prompt length between 0 and 15 seconds. The default setting is 2 seconds.

Custom Page Tasks

The Custom Page Tasks field defines the number of paging tasks the software processes. When a Y is entered, the window shown in Figure 7-8 appears.

PG_TASKS
Minimum: 003
Maximum: 080

Figure 7-8. Page Tasks Window

The Page Tasks window contains the following fields:

<i>Minimum</i>	Enter the minimum number of page tasks the switch should process. The minimum should be between 1 and 199. The default setting is 3.
<i>Maximum</i>	Enter the maximum number of page tasks the switch should process. The maximum should be between 2 and 200. The default setting is 80.

These parameters define the absolute system allocation limits for software processes to handle calls. FASTNet calculates working values for these parameters based upon the number of installed trunks and programmed options. FASTNet uses the computed parameter values, unless they fall outside of the Minimum and Maximum boundaries defined here. The Minimum and Maximum *programmed limits always prevail over the internally computed limits* in case of conflict.

The default setting for the Custom Page Tasks field is N. This is the recommended setting.



Note:

Setting these parameters incorrectly may cause a decrease in system performance. Contact Zetron before altering the default values.

Set Modem Port

This field configures the Model 2540 modem parameters. The Model 2540 modem *always* uses no parity, 8 data bits, and 1 stop bit per word during serial communications (these are not selectable). When an N is entered, the modem is defaulted to 2400 baud. When a Y is entered, the window shown in Figure 7-9 appears.

```

ADVANCED
Set ADPCM card parameters?:Y ...
Log File size:20000
Number of Log Files:020
Use Logging Printer?:Y ...
Traffic Filter Type:A ...
Total PCM Paths:48
Minimum Voice Threshold:03
Minimum Prompt Duration:02
Custom Page Tasks?:Y

FAST MOD
FASTNet Modem Port Baud:9600
Use Shared Modem?:N ...
Custom FASTNet Modem String?:N ...
  
```

Figure 7-9. FASTNet Modem Window

The FASTNet Modem window contains the following fields:

<i>FASTNet Modem</i>	Press <Enter> to select from a list of available baud rates
<i>Port Baud</i>	(300, 1200, 2400, 4800, or 9600). It is not normally necessary to adjust this parameter from the factory-set value.
	The default setting is 2400 baud.



Note:

Setting the TCE modem baud rate does not automatically set the FASTNet Switch's baud rate. The information *must* be downloaded to the Model 2540. It is critical that the baud rate be set correctly for non-autobaud modems.

In addition, the modem baud rate set in the TCE must match the settings in Fastbase and Netlink.

Section 7. Trunk Card Editor

Use Shared Modem

This field indicates whether the internal system modem is sharing a FASTNet trunk. When a Y is entered, a window appears with a listing of all the installed FASTNet trunk cards (when previously programmed).

If no trunk cards have been programmed, TCE jumps to the next field when <Enter> is pressed. Return to this field *after configuring the trunk cards* to select the shared trunk for the modem, if required.

Select the appropriate trunk card from the list provided. The default setting is N.

Custom FASTNet Modem String ?

This field determines whether a special modem string is required for TCE modem communications. When a Y is entered, a window appears, prompting for the new modem string. When an N is entered, the default initialization string is used:

AT S0=2 S7=30 S9=06 S10=04

Set Local Port

This field selects the baud rate for the local serial port of the Model 2540. When a Y is entered, a window appears prompting for the baud rate. Press <Enter> to select a baud rate from the list of available settings (300, 1200, 2400, 4800, or 9600).

The default setting for the local serial port is 4800 baud.



Note:

Make sure the Set Local Port field matches the PC COM port Baud Rate setting in Fastbase (Editnet, Nodes, Node Access = L). If the baud rates are set improperly and communications cannot be established, use the modem port to access the FASTNet Switch.

Edit MasterCard Modem

This field baud rate for the MasterCard modem in Model 2540 units equipped with a 386 CPU Card. This field configures the modem which resides *on the MasterCard board*. When a Y is entered, a window appears, prompting for the baud rate. Press <Enter> to select a baud rate from the list of available settings (1200, 2400). The modem *always* uses no parity, 8 data bits, and 1 stop bit per word during serial communications (these are not selectable).

The default setting for the mastercard modem communications rate is 2400 baud.

Enable Forwarding Beeps

This field enables the call transfer forwarding beeps. If the Call Forwarding feature of FASTNet is disabled, this field has no effect.

Y (es) and N (o) are the only available entries. The default setting is Y.

Network Dispatch Tasks

This field determines the maximum number of network dispatch calls the FASTNet Switch processes simultaneously. If this parameter is set too large, system performance may be affected.

Enter a maximum number of Network Dispatch Tasks between 3 and 10. The recommended and default setting is 3.

TRUNK GROUP CONFIGURATION

The Trunk Groups are used by the FASTNet software to establish interconnect paths quickly and efficiently while initiating telephone calls. Figure 7-10 illustrates the call trunk group processing.

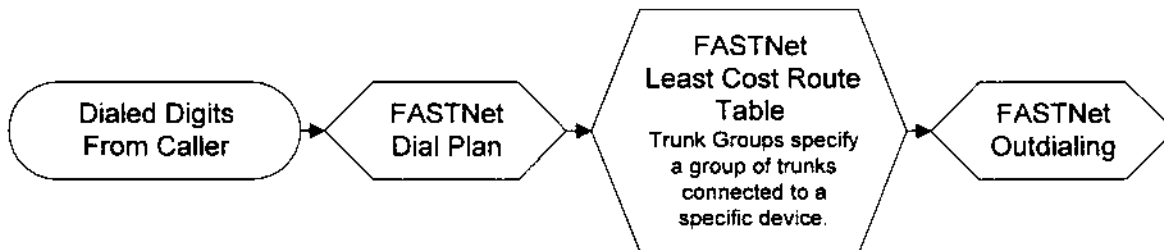


Figure 7-10. Trunk Groups During Dialout

Statistical analysis and billing functions also rely upon the Trunk Groups for data classification. A trunk group identifies a group of phone lines that share general operational characteristics and/or billing parameters. For example, several Model 49/459 trunks might be routed to a specific repeater site, or all the DID trunks from the local phone company might be routed to another FASTNet Switch.

Since the FASTNet phone lines are *trunks*, unused lines can be seized in *any order* to complete a call. By grouping similar types of lines into a single trunk group, the FASTNet software can choose *any available* line within the group to provide equal service and billing characteristics for the mobile customer. Placing two or more sites under one group generally does not make sense, although the TCE is flexible enough to allow such a configuration (however, Fastbase is not).

All lines that are not assigned to a trunk group (such as DID lines), should be placed in a separate group #00. Trunks groups are assigned on a per-card basis.

Section 7. Trunk Card Editor

It is generally a good idea to give each trunk group a meaningful and unique name to help organize the connection scheme. The TCE places the current node number being configured in the upper left corner of the Trunk Group Configuration window, as shown in Figure 7-11, to help navigate through the FASTNet systems.

FASTNet Trunk Card Config. Editor V1.6 (c)1993-95 Zetron (SUPERVISOR mode)

INDEX	
TG	COMMENT
01	E-E NORMAL LINES
02	E-E CHEAP DX LINES
03	E-E FOREIGN XCHG
04	MODEL 49 E&M 4-W

HELP	
Press 'Enter' to see Hunt Method choices.	

NODE 000001	
TRUNK GROUP CONFIGURATION	
Trunk Group: [01]	
Comment: [E-E NORMAL LINES]	
Voice Prompts: B	
Security: Y	
Wink Limit: 04	
Hunt Method: LOWEST ...	
Create Date: 04/25/95	
Alter Date: 04/28/95	

beginning of database

Figure 7-11. Trunk Group Configuration

Initial Configuration

If configuring a system from scratch, select Edit / Trunk groups from the TCE main menu and choose a node. Then press <Enter> to move to the data window on the right side of the screen. Figure 7-11 shows the fields in the trunk group configuration.

Trunk Group

This field assigns a unique number to the trunk group for identification purposes.

Enter a trunk group number between 0 and 99. A setting of 00 indicates that the trunks should **NOT** be grouped, but parameters should still be applied. There is no default setting for the Trunk Group field.

Comment

This field allows the system operator to add text to further identify the trunk group.

Enter a text string up to 19 characters in length. There is no default setting for the Comment field.

Voice Prompts

This field determines the type of voice prompt used on this trunk. The following settings are available:

N	No prompts enabled
T	Tone prompts only enabled
V	Voice prompts only enabled
B	Both tone <i>and</i> voice prompts enabled

**Note:**

This parameter does NOT affect the voice prompts in the Model 49/459s. Only the Model 2540 prompt types are selected with the Voice Prompts field.

The default setting for the Voice Prompts field is B - both tone and voice enabled.

Security

This field enables the system security code. When enabled (Y), the security code is required at the prompt before the user is granted normal trunk access. The security code can block all unauthorized use of trunks in this trunk group. Be aware that use of the security option may annoy frequent callers, due to inconvenience.

Y (es) and N (o) are the only available settings for the Security field. The default setting is Y.

Wink Limit

This field determines the amount of time (in 100 ms increments) FASTNet waits for a Model 49/459 wink. When the wink limit expires, the Model 2540 tries the next Model 49/459 trunk. If the wink limit is set too long, the system throughput may be reduced due to delay. If it is set too short, the result may be erratic operation and reduced system throughput.

Enter a maximum wait time between 1 (0.1 seconds) and 99 (9.9 seconds). The default setting is 4 for Model 49/459 units (400 ms, 0.4 seconds).

Hunt Method

This field selects the method in which this Trunk Group searches for an available trunk line. Press <Enter> to access the list of available settings, as follows:

LOWEST	Scan up from the lowest-addressed trunk in the group to use the first available trunk.
--------	--

Section 7. Trunk Card Editor

HIGHEST	Scan down from the highest-addressed trunk in the group to use the first available trunk.
ROTARY	Increment to the next higher trunk in the group from the trunk used last; use if available. Otherwise scan up for the next available trunk and try again.
REVROTARY	Decrement to the next lower trunk in the group from the trunk used last; use if available. Otherwise, scan down for the next available trunk and retry.
AVERAGE	Choose the first available trunk in the group which currently has the lowest average "loading".

The default setting for the Hunt Method field is LOWEST.

TRUNK CARD CONFIGURATION

Once the trunk groups have been defined for the system, each dual trunk card must be configured. Each *physical* dual trunk card has two trunks, or “logical” cards. Each trunk on a card may be connected to its own line and is designated with an ‘A’ or ‘B’ suffix. This physical card ‘7’ has two programmable cards, 7A and 7B.

Initial Configuration

If configuring a system from scratch, select Edit / Cards from the TCE main menu and choose a node. Then press <Enter> to move to the data window on the right side of the screen. Figure 7-12 shows the fields in the trunk group configuration.

FASTNet Trunk Card Config. Editor V1.6 (c)1993-95 Zetron (SUPERVISOR mode)

INDEX
TCD CARD_NAME TG LINETYP

TRUNK CARD CONFIGURATION

Card #:[]
Name:[]
Trunk Group:[] ...
Line Type:[E&Mwink] ...
Image File:????????
Cmnt:
Create Date:04/25/95
Alter Date:

HELP
Enter comment to be added to
oparam.cds file.

This HELP box
appears when the
comment field is
selected ...

This IMAGE FILE
specification is
downloaded from the
Model 2540 Switch
with the initial
download during
installation.
DO NOT CHANGE

Figure 7-12. TCE Trunk Card Configuration

The Trunk Card Configuration window contains the following fields:

Card

This field uniquely identifies the card being configured (up to 60 trunks depending on configuration purchased).

Enter a two-digit card # (between 01 and 30) and an A or B designation. There is no default setting for this field.



Note:

The trunk card number programmed here equates to the hardware trunk card address, and in fact bears absolutely NO relation to the physical trunk card slot where the trunk card is installed! The system planning engineer or technician must define which trunk card address corresponds to which physical slot prior to installation, so that the wiring is routed to the proper trunk.

Name

This field is used to identify the card's function. Choose a name which can be easily remembered and associated with the trunk being programmed.

Enter a character string up to 20 characters in length for the Name. There is no default setting for this field.

Trunk Group

This field identifies which trunk group this trunk belongs to. When <Enter> is pressed, a list of previously programmed trunks appears.

Line Type

This field selects the telco line type that is connected to this trunk. When <Enter> is pressed, a list of trunks supported by the Model 2540 appears. Figure 7-13 shows the available line types.

NODE 000001	
TRUNK CARD CONFIGURATION	
Card #:[01A]	
Name:[01A E&M WINK TRUNK]	
Trunk Group:[04] ..	
Line Type:[Model49]	<div> DIDimm DIDwink RingBox EndtEnd GndStrt E&Mimm E&Mwink Model49 810DIDi 810DIDw 810EtE CUSTOM E&Mtie </div>
Image File:????????	
Cmnt:IMAGE FILE MUS	RTED
Create Date:04/25/9	
Alter Date: 05/01/9	

Figure 7-13. Trunk Line Type Selection

Use the arrow keys (←, ↑, →, ↓) to highlight the appropriate line type and press <Enter>. Once a line type is selected, an applicable window appears, requesting detailed information about how to handle the trunk.

Each trunk card must be programmed to service the hardware configuration and line connections which have been wired to that trunk card's "slot" in the Model 2540 Main or Expand Chassis. Each of the available card Line Type configurations are discussed below. Line Type parameters that do not change, but which must be generated for the card, do not appear on the screen and are in fact hidden. Their contents may be viewed by printing out detail information for the cards.

The following screens appear when each item is selected from the list of line types. The exception is the "Model49" which has defaults that are not user selectable. Refer to Section 2 of the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260) for timing diagrams of each telco line type.

Information on how to "block copy" telco line type records is provided in "Block Copying Records" on page 7-38.

DID Immediate Start

The DIDImm line type window is shown in Figure 7-14.

```

DID_IMM-----
Number of Feed Digits: 3
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...
Answer Supervision?:Y
  
```

Figure 7-14. DID Immediate Start Line Type Window

The DID Immediate Start window contains the following fields:

<i>Number of Feed Digits</i>	This field must be set to the exact number of feed digits provided by the local phone company. An incorrect setting will result in an error.
	Enter a number between 1 and 7. The default setting is 1.

Section 7. Trunk Card Editor

Dial Click Decode

This field indicates if an optional dial click decoder board is installed for this trunk. Refer to Section 4 of the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260) for details on installation of this board.

Y (es) and N (o) are the only available entries. The default setting is N.



Note:

DID inputs requiring MF protocol feed digit must be setup using the Custom Line Type field in Cards configuration.

DTMF Detect Time

This field determines the minimum time needed to detect each digit when the local phone company is feeding DTMF.

Enter a time between 40 and 100 ms. The default setting is 40 ms.

Feed Digit Timeout

This field determines how long the system waits after the last feed digit to stop monitoring the line when an erroneous or incomplete feed digit sequence is detected.

Enter a timeout between 0 and 10 seconds. The default setting is 5 seconds.

Disconnect on Silence

This field disconnects the trunk after an extended period of no signal in voice messaging. When a Y is entered, the parameter is enabled, and another box appears. Enter the maximum silence time required before a call is disconnected.

The Duration to Disconnect must be between 15 and 100 (in 1/10 second increments). The default setting is 30 (3 seconds).

Y (es) and N (o) are the only available settings for the Disconnect on Silence field. The default setting is Y.

Use Feed Digits

This field determines if the trunk receives feed digits from the local phone company or another source. When a Y is entered, the Feed Digit window shown in Figure 7-15 appears in which to enter the supervision type. The following settings are available:

N - No supervision

I - supervise the line, but Ignore incoming calls

W - supervise the line, issue Warning tone, then hang-up

S - Supervise the line, answer the line, then proceed

The default setting for the Supervision type is S.

FEED_DIG			
Supervision: S			
Block	Low	Number	High
Number			Number
0.			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Figure 7-15. Feed Digits Window

The Block Low Number and High Number fields determine which blocks of phone numbers are assigned to the current trunk card. A node user number block is a range of digits that must be reconstructed from the received DID feed digits, and then forwarded to the FASTNet CPU for call processing.

Y (es) and N (o) are the only settings available for the Use Feed Digits field. The default setting is Y.



Note:

The phone company may unintentionally give more feed-digit codes than have been assigned (giving free phone numbers). There is no guarantee that this will remain the case, so *don't* expand the assigned blocks to use those unassigned numbers.

If the correct number of feed digits is not properly specified (see Figure 7-14), there is no way to correctly extract the feed digits from this table. In fact, if the number of feed digits is set to '0', then only the "Low Number" number in each block is used and the "High Number" is ignored.

Answer

Supervision

This field determines whether the line is supervised when the called party answers. When a Y is entered, supervision is enabled immediately after the feed digits are received. This setting is useful when the telco does not allow audio from the landline before supervision.

Y (es) and N (o) are the only settings available for the Answer Supervision field. The default setting is Y.

DID Wink Start

The DIDwink line type window is shown in Figure 7-16. The configuration data fields are basically identical to the 'immediate start' DID trunks, but different trunk card configuration files are utilized to process the "winking". For field information, refer to "DID Immediate Start" on page 7-27.

```

DID_WINK
Number of Feed Digits: 3
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...
Answer Supervision?:Y
    
```

Figure 7-16. DID Wink Start Line Type Screen

Zetron Ring Box

The RingBox line type window is shown in Figure 7-17. The fields are similar to the DID line types previously discussed. Refer to “DID Immediate Start” on page 7-27 for details on fields that appear in both line type windows.

```

RING_BOX
Number of Feed Digits: 3
DTMF Detect Time (msec): 040
Overdial Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...

```

Figure 7-17. Ring Box Line Type Window

The Ring Box window contains the following unique fields:

Overdial Timeout This field specifies the “interdigit” time. This is the maximum time that the Model 2540 waits between feed digits overdialed from the ring box telephone set (i.e., dialed by the user).

Enter a time between 0 and 10 seconds. The default setting is 5 seconds.

End-to-End (Loop Start)

The EndtEnd line type window is shown in Figure 7-18. Loop start end-to-end lines are often referred to as POTS (Plain Old Telephone Service) lines. The end-to-end line type uses a different signaling scheme than the DID line types discussed previously. For this interface, FASTNet expects ringing on the line to signal an inbound call.

```

END_TO_END
Rings Before Answer: 1
Line Direction: B
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Disconnect on Silence?: Y ...
Answer Script: 1000003

```

Figure 7-18. End-to-End Loop Start Line Type Window

Section 7. Trunk Card Editor

The End-to-End window contains the following fields:

Rings Before Answer This field determines the number of rings before the switch answers the call. Usually this should be set to "1" to minimize response time, especially since FASTNet usually redials to a mobile or forwards the call elsewhere. Too many rings during this entire process cause the initial calling party to drop the call, possibly before the target party even receives ringing.

Enter a number of rings before between 1 and 9. The default setting is 1.

Line Direction This field determines the kind of calls processed through this trunk. The settings available are:

I - Inbound calls only

O - Outbound calls only

B - Both inbound and outbound calls

The default setting is B.

Answer Script This field identifies the appropriate script to process this line type. The available choices are:

1000002 - get over dial direct

1000003 - get over dial normal

A script is a macro language that can be invoked by a Node user number (however, not all scripts are designed to be invoked this way). Refer to "Script User Type" in Section 4. This mechanism provides the most flexibility in configuring a system but requires certain cards to be assigned "Answer Script" numbers in the TCE. Values have been reserved for these scripts, which are actually Node User phone numbers starting at 1000000. These scripts provide software control for certain line types, including End to End.

Enter the appropriate Node User phone number into the Answer Script field. For end-to-end, this value is usually 1000003 (default setting).

If a custom end-to-end configuration is required, this number may have been set to another value at Zetron. Contact a Zetron applications engineer for help.

Ground Start (End-to-End)

The GndStrt line type window is shown in Figure 7-19. The fields are identical to the End-to-End Loop Start data field, but the trunk card configuration written to FASTNet is unique for this Ground Start specification.

```
GROUND_START-----
Rings Before Answer: 1
Line Direction: B
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Disconnect on Silence?: Y ...
Answer Script: 1000003
```

Figure 7-19. End-to-End Ground Start Line Type Window

Refer to “End-to-End (Loop Start)” on page 7-31 for field information

E&M Immediate Start

The E&Mimm line type window is shown in Figure 7-20. For the E&M Immediate field information pertaining to inbound DID functions, see “DID Immediate Start” on page 7-27.

```
E&M_IMMEDIATE-----
Number of Feed Digits: 3
Line Direction: B
MF Decode Only?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...
Answer Supervision?:Y
Ringback Slave?:Y
```

Figure 7-20. E&M Immediate Start Line Type Window

The E&M Immediate window contains the following unique fields:

- | | |
|-----------------------|--|
| <i>MF Decode Only</i> | This field enables multifrequency decoding with DTMF dialing. An optional MF Decoder Card (Part No. 802-9197) must be installed for this trunk, if this field is set to Y. |
| | Y (es) and N (o) are the only available settings. The default setting is N. |

Section 7. Trunk Card Editor

Ringback Slave This field determines whether the FASTNet central programming controls ringback on incoming calls. If this field is set to N, the trunk card initiates ringback. The Ringback Slave field should normally be set to Y for E & M lines.

Y (es) and N (o) are the only available settings. The default setting is Y.

E&M Wink Start

The E&Mwink line type window is shown in Figure 7-21. For the E&M Wink fields pertaining to inbound DID functions, see “DID Immediate Start” on page 7-27 and “End-to-End (Loop Start)” on page 7-31 for field information..

```
E&M_WINK
Number of Feed Digits: 3
Line Direction: B
MF Decode Only?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...
Answer Supervision?:Y
Ringback Slave?:Y
```

Figure 7-21. E&M Wink Start Line Type Window

810 DID Immediate Start

The Zetron Model 810 Digital Hybrid can be connected to the Model 2540 by choosing the appropriate Model 810 2-wire line type. Since a Model 810 is connected to a two-wire line, we refer to it as DID or end-to-end (loop start only). Technically, the Model 810 connects to the FASTNet Switch using E & M 4-wire Type I signaling. For this interface, the Model 2540 must process the DID immediate start trunk protocol through the E & M 4-wire interface to the Model 810. The 810DiDi line type window is shown in Figure 7-22.

```
810_DID_IMMED
Number of Feed Digits: 3
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...
Answer Supervision?:Y
```

Figure 7-22. Model 810, DID Immediate Start, Line Type Window

Refer to “DID Immediate Start” on page 7-27 for field information.

810 DID Wink Start

The 810DIDw line type window is shown in Figure 7-23. For this interface, the Model 2540 must process the DID wink start trunk protocol through the E & M 4-wire interface to the Model 810.

```

810_DID_WINK
Number of Feed Digits: 3
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: Y ...
Answer Supervision?:Y

```

Figure 7-23. Model 810, DID Wink Start, Line Type Window

Refer to “810 DID Immediate Start” on page 7-34 and “DID Immediate Start” on page 7-27 for information on the fields in the 810 DID Wink window.

810 End-to-End (Loop Start)

The 810EtE line type window is shown in Figure 7-24.

```

810_END_TO_END
Rings Before Answer: 1
Line Direction: B
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Disconnect on Silence?: Y ...
Answer Script: 1000003

```

Figure 7-24. Model 810, End-to-End Loop Start, Line Type Window

Refer to “End-to-End (Loop Start)” on page 7-31 for information on the fields in the 810 End-To-End window.

Section 7. Trunk Card Editor

Custom

The Custom line type provides configuration support for cards not specifically listed, and for special trunk line connections and/or signaling. Figure 7-25 shows the Custom line type window.

```
CUSTOM_CONFIG
Card ID (decimal):

Rings Before Answer: 0
Number of Feed Digits: 0
Line Direction: B
MF Decode Only?: N
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: Y ...
Use Feed Digits?: N ...
Answer Script:
Answer Supervision?:N
Ringback Slave?:Y
```

Figure 7-25. Custom Line Type Window



Caution:

It is very easy to create a non-functional card type using the Custom configuration. Please consult a Zetron applications engineer before attempting to configure a custom line type.

The Custom window contains the following unique field:

Card ID

This field specifies the line type to be customized.

Enter the applicable line type as a decimal number between 00 (0 in hex) and 255 (ff in hex). For the hexadecimal values for these codes, see "OPARAM.CDS File" in Section 10. Refer to decimal/hexadecimal conversion charts when using this field with existing OPARAM.CDS files. For example, an E&M Wink card has a hex ID of 19, which translates into 25 decimal. Enter '25A' or '25B' (there are two ports/units per card) into the "Card ID" field. There is no default setting for the Card ID.

The custom configuration facilitates both the Answer Script and Use Feed Digits fields. Use only one *or* the other - conflicts cause problems. Technically, an answer script number is the same as setting "Block 0" low/high feed digits to 1000xyz,1000xyz;

where xyz = 000 - Model 49 E & M 4-wire trunk
 002 - Get Overdial for DID trunk
 003 - Get Overdial for end-to-end trunk

The rest of the fields in the Custom line type window have been previously explained. Refer to "DID Immediate Start" on page 7-27 and "End-to-End (Loop Start)" on page 7-31 for more details.

E&M TIE Trunk (to Another Model 2540)

The E&Mtie line type configures the card for connection to another Model 2540 using an E & M 4-wire, wink start interface. Although only the DTMF Detect Time can be altered, Figure 7-26 shows the correct parameters for this configuration.

```

E&M TIE
Number of Feed Digits: 0
Line Direction: B
MF Decode Only?: N
Dial Click Decode?: N
DTMF Detect Time (msec): 040
Feed Digit Timeout (sec): 05
Disconnect on Silence?: N ...
Answer Script: 1000000
Answer Supervision?:Y
  
```

Figure 7-26 E&M Tie Trunk Line Type Parameters

Section 7. Trunk Card Editor

Image File

The Image File field should have been filled during the initial download from the Model 2540 FASTNet Switch. The Image File resides on the FASTNet hard drive, and is used by TCE to program the Dual Trunk Card personalities. This filename should never be changed unless directed by a Zetron applications engineer, and will probably require a factory download of the appropriate new files to the switch.

Cmnt

The comment field stores some card-specific text, if desired. These comments are not *used* by any of the FASTNet software, but they are stored in the Model 2540 hard drive with the other data.

Enter an appropriate description up to 20 characters in length. There is no default setting for this field.

Block Copying Records

It is often useful to block copy records in the trunk configuration. This saves time and redundant typing when the FASTNet Switch has a large number of Dual Trunk Cards installed. For example, to perform a block copy of a telco line type configuration, follow the steps below.

- 1) Program one trunk as desired. (Or bring up the data window of an already-programmed trunk.)
- 2) Exit to the "INDEX" window (on the left side of the screen) using the <Esc> key.
- 3) Press the <F5> key to perform a block copy of the line type.
- 4) When prompted, enter "01A" as the base record and 5 (or however many copies are needed) as the number of records to add as in Figure 7-27.

5) Answer Y to the final prompt.

STATUS

Each record will be the same as the base record except that the Card # will be incremented by 1 from the original record's base number. You must enter the base record number. Type ESC to exit

Base of range (rrU): 01A

Number of records to add: 5

Enter the Base of Range as rrU:
where rr = trunk address,
and U = trunk A or B

Adding "5" records includes records for "A" and "B" trunks at each trunk address. e.g. adding 5 records from base 01A would add 01B, 02A, 02B, 03A and 03B to the database

Figure 7-27. Block Copying Trunk Configurations (Using <F5>)

In this example, end-to-end loop start lines are block copied. The TCE creates five identical card configurations, as in Figure 7-28. These cards can be edited or customized later. Block copying helps speeds the configuration of the system.

FASTNet Trunk Card Config. Editor V1.6 (c)1993-95 Zetron (SUPERVISOR mode)

INDEX

TCD	CARD NAME	TG	LINE	TYP
01A	E-E LOOP START #1	01	EndtEnd	
01B	E-E LOOP START #1	01	EndtEnd	
02A	E-E LOOP START #1	01	EndtEnd	
02B	E-E LOOP START #1	01	EndtEnd	
03A	E-E LOOP START #1	01	EndtEnd	
03B	E-E LOOP START #1	01	EndtEnd	
05A	M49 SITE001 RPTR15	04	Model49	
05B	M49 SITE001 RPTR20	04	Model49	
06A	M49 SITE001 RPTR01	04	Model49	

NODE 000001

TRUNK CARD CONFIGURATION

Card #: [01B]
 Name: [E-E LOOP START #2]
 Trunk Group: [01] ...
 Line Type: [EndtEnd] ...
 Image File: ????????
 Cmnt: E-E LS TELCO TRUNK 1

Create Date: 05/01/95
 Alter Date: 05/01/95

HELP

Edit: press ENTER/RETURN/<-+

Guide Window: F1

Done: Esc

Five copies of trunk card configuration 01A, as indicated in Figure 7-27, have been created. Their descriptions can be edited later.

Note that the trunk addresses for each copy have been automatically incremented as a function of the copy process.

Figure 7-28. Block Copied Trunk Card Configurations

INSERTING NON-STANDARD COMMANDS

Some rarely used parameters can be assigned to Cards, Trunk Groups, and the System through the use of a special append file from the TCE. When you choose "Generate" for the first time for a node, the TCE creates a file called SPnnnnnn.APP. 'nnnnnn' is the six digit node number. This file contains designators for each card and group in that node. If you wish to add a new card parameter, or an existing, little used parameter (such as "VOX Disconnect Threshold"), place it after the card number using an ASCII text editor (See Section 10). You may add more than one line per designator.

A typical *.APP file follows:

```
***
[oparam]
{1A}
{1B}
{2A}
...
{6B}
{7A}
07 00    02    13    64          ; .09VAC RMS VOX disconnect threshold
{7B}
...
{30A}
{30B}
[trunks]
{1}
{2}
{3}
{81}
{80}
Supergroup Group 1 Group 2 Group 3
[options]
RingSwitchAlarm 10:30AM
ConsolidateSMDR 3:00AM
***
```



Note:

If you add cards to the system after this file has been generated, you must manually add the curly brackets - { }, card numbers - 13A, and the special commands to the file.

When you import from the switch, this file is written over and regenerated.

The append file feature is included to reduce the need for new TCE versions for new FASTNet features--these new features can be added to the append file and eventually incorporated into new versions of the TCE and field items.

Append files are stored during BACKUP, and retrieved during RESTORE.

Non-Standard Command Function

How it works: When importing, if the “parser” doesn’t recognize a command, it stores it into the append file. When exporting, it searches the append file for lines to add at the appropriate places in the parameter files.



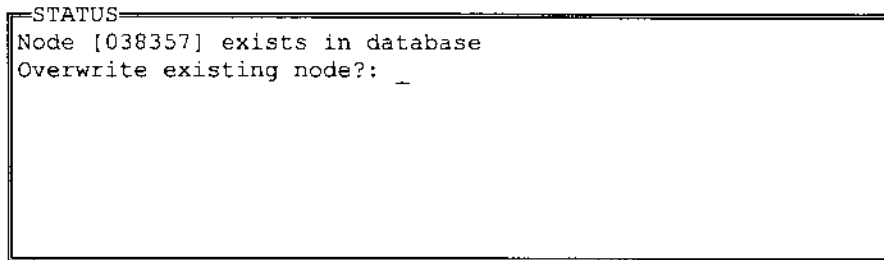
Caution:

Erroneous entries in the parameter files (caused by editing them improperly with a text editor) may be added to the append files during import. When generated and downloaded, the switch may complain about these entries. Ideally, if manually editing the parameter files, download them first to the switch using the TCE and verify that the switch reads them without error.

COMPLETING THE DATABASE

Before transferring the information in the TCE database to the Model 2540, retrieve the current TCE parameter files from the switch so that a known working version of the files exists.

When retrieving data files from the switch, a message similar to that shown in Figure 7-29 may be displayed on the monitor screen.



```
STATUS
Node [038357] exists in database
Overwrite existing node?: _
```

Figure 7-29. Typical Overwrite Query During Retrieve

Selecting Y may overwrite important database information that was just edited. However, if the data was backed-up, no new data is lost. As a general rule of thumb: Choose Y if the database is regularly backed-up, retrieved, and updated. Choose N if in the process of configuring systems or before doing backups. When N is entered, the system asks for another node number to download the database under.

It may also be desirable to change the System Name to something like "Original Working Version" and then perform a backup of the new work and/or original database files to floppy disk. Label the floppy disk(s) appropriately.

After all of the trunk cards are configured in the TCE file and a known working version of the files is saved, transfer the information in the TCE database to the switch.

For more information, see "Exporting to the Switch" on page 7-45 and "Importing from the Switch" on page 7-47.

COMMUNICATING WITH THE SWITCH

The Comm menu initiates communications with the Model 2540 to send and/or receive the FASTNet Switch's parameter files. These system parameter files are often referred to as "Oparams" (based upon the filename OPARAM.CDS). These parameters are in ASCII text file format.

Retrieve and Update Procedure Flowcharts

Once serial communication is established, either *to* or *from* the FASTNet Switch, the system operator must select one of two possible file transfer methods:

- to/from the database
- to/from ASCII files

Flowcharts of these procedures follow in

Updating from the TCE Database

When Update, From Database is selected from the TCE main menu, the database is transferred from the TCE to the FASTNet Switch. The system communication procedure is shown in Figure 7-30.

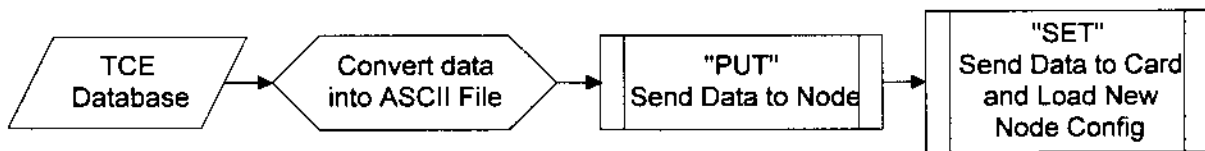


Figure 7-30. TCE (Database) to Model 2540 Update

Updating from a TCE ASCII File

When Update, From Files is selected from the TCE main menu, the ASCII file is transferred from the TCE to the FASTNet Switch. The system communication procedure is shown in Figure 7-31.

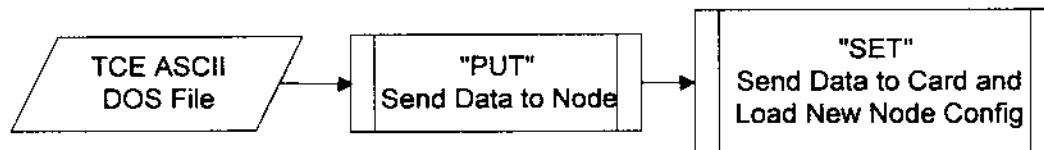


Figure 7-31. TCE (ASCII File) to Model 2540 Update

Retrieving the Database from the Model 2540

When Retrieve, To Database is selected from the TCE main menu, the database is transferred from the FASTNet Switch to the TCE. The system communication procedure is shown in Figure 7-32.



Figure 7-32. Model 2540 to TCE Retrieve

Retrieving the ASCII File from the Model 2540

When Retrieve, To Files is selected from the TCE main menu, the ASCII file is transferred from the TCE to the FASTNet Switch. The system communication procedure is shown in Figure 7-33.

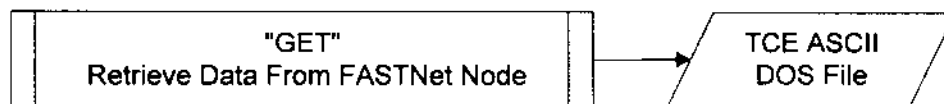


Figure 7-33. Model 2540 to TCE Update

Modem Communications

When data is transferred into or out of the *database*, TCE handles all modem communications.

When files are imported, TCE connects to the FASTNet Switch, and then retrieves the data to either ASCII file or database format, as specified.

When files are exported, TCE first generates ASCII files, and then connects to the Model 2540 to update the database.



Caution:

If the computer is used to access more than one FASTNet Switch with the TCE, use the Update/Retrieve, From/To Database functions. These operations prevent accidentally leaving the wrong system's ASCII files in the TCE directory for later import or export.

Exporting to the Switch

The information stored under a node in the database may be exported to parameter files and then to the FASTNet Switch. Follow the steps below to export to a file:

- 1) Select Files, Generate from the TCE main menu.
- 2) If no node is active, select the desired node to generate. The TCE program processes the binary data generated from the TCE editing session in order to create five ASCII text files. The files required by the FASTNet operating software for normal operation are:
 - OPARAM.CDS
 - TRUNKS.CUS
 - OPTIONS.CUS
 - CONFIG.CDS
 - PARAM.SYS.

Viewing and Editing ASCII Files

After completion, it is possible to view the files with any ASCII text editor.

The TCE also adds limited commenting to the ASCII files to help debug the generation procedure. If you wish to learn how the switch responds to commands in the parameter files, refer to Section 10. Use this information to analyze what the TCE did with its database contents.



Caution:

Do NOT open and then save the ASCII system configuration files in a word processor using "Document Mode". This can corrupt the file contents and render the Switch unable to read the files. If unsure about the quality of these files, regenerate them using the above procedure.

Preserving Switch Data

The Generate function overwrites the aforementioned ASCII files in the current directory. If any of these ASCII files have been added or edited, and need to be preserved, then Import the files into a *new node* in the TCE database *before* performing the Generate. This prevents any changes from being lost.

To ensure a consistent transfer of information to the switch, select Comm / Update / From Database. This guarantees that the *current database* contents are sent to the switch. As an example, the flowchart of Figure 7-34 shows a typical chain of events that should be **carefully avoided**.

Section 7. Trunk Card Editor

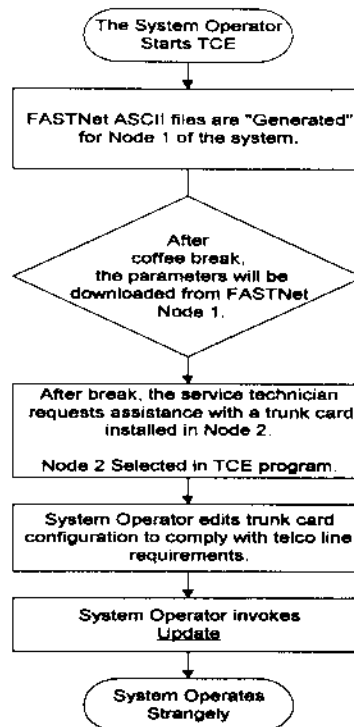


Figure 7-34. Typical Transferring Miscue

In this case, the files for Node 1 were downloaded into Node 2 accidentally since the last files generated were for Node 1.

To prevent this problem, either select Node 1 and invoke Files / Generate followed by Comm / Update, From Files, or else select Node 1 and invoke Update / From Database.

Export Validation

Configuration errors may be detected during file "Generation". Some typical errors are:

- Incorrect feed digit assignment
E.g. 5551000,5550100 is wrong because the 'high' block number is lower than the 'low' block number ...
- Missing group for card
A trunk group was not assigned to one of the Trunk Cards. Look at Edit / Cards / Trunk Group field for the first trunk card, and use the (↑) and (↓) keys to check each Trunk Card configuration.
- Wrong card for modem sharing
Look at Edit / Nodes / Edit Advanced Features? / Set Modem Port (Y) / Use Shared Modem (Y) / Trunk Card To Use = _____.
Make sure that the proper trunk card was selected, including the A/B designation.

**Note:**

Shared modem operation only functions properly on Outbound Only trunks (set in the Line Direction field in the Line Type window).

- A card's parameter is different from the other cards in its group
All cards in any one Trunk Group *must* be configured with the same trunk parameters

TCE "generation", "retrievals", "errors" and other significant file events are logged to an audit file called TCE.AUD. If an on-screen error occurs, refer to this file before continuing. File contents may be viewed from the TCE directory, by typing "TYPE TCE.AUD ↵", or by editing with any ASCII text editor program. A sample screen showing a TCE.AUD file after executing a successful Generate function is shown in Figure 7-35. Call Zetron if assistance is needed.

```

TCE_SMPL.AUD
OPARAM/TRUNKS/OPTIONS EXPORT -- TCE.AUD V1.3 -- 05/08/95 11:26:19
Generating Oparam.cds:
*** Processing card 01B
*** Processing card 07B
*** Processing card 13A
**** Generating TRUNKS ***
**** Generating OPTIONS ***
*** Done

```

Figure 7-35. Sample TCE.AUD File Printout

Importing from the Switch

Data can be imported into the database from existing oparam files in the TCE directory or from the switch.

The TCE "parses" the ASCII file contents into a database format. While parsing, the TCE makes sure that the data in the ASCII parameter files is internally consistent and flags any errors as they occur. This prevents erroneous configurations that could upset proper switch operation. It is possible, given time, to add commands) into the appropriate text file and configure a switch with these files (see Section 10). Generally, however, it is easiest to perform this task directly in the TCE.



Note:

The TCE will not import or retain comments (any text preceded by a semicolon “;” character in the ASCII files) from manually created parameter files (except under certain circumstances).

Select Comm / Retrieve / To Database from the TCE main menu to import parameter files from the Switch. The TCE connects to the switch, uploads the parameter files and then executes Files / Import automatically. The parameter files are imported in the following order:

- OPARAM.CDS
- TRUNKS.CUS
- OPTIONS.CUS
- CONFIG.CDS
- PARAM.SYS.

During the “Import” process, the TCE may determine the node number contained in the “retrieved” parameter files matches an existing database node. To avoid overwriting the existing database, choose a new and unassigned node number.

If any problems occur during the import procedure, an error message is written into the TCE.AUD file (also used for exporting). The error messages in the TCE.AUD file are usually more detailed than those that appear in the status window. If you have any questions about a particular import, call Zetron.

A message appears after all information has been converted to the database format to indicate a successful conversion. If a fatal error occurs, TCE aborts the import process and displays an appropriate message. In either case, the TCE.AUD file contains a record of events (Refer to Figure 7-35).



Caution:

When importing files for the first time, watch for errors. TCE converts parameters, even if they are in error (by using default values). Although unlikely, this may affect system operation after the switch is updated with the defaulted database.

FASTNet Monitor

TCE also provides a monitoring mode. To enter this mode, select Comm / Monitor from the TCE main menu. Then select a node from the list provided. If only one node exists, TCE automatically selects it. TCE dials up the FASTNet Switch and then prints real-time system activity to the screen.

Exit from the live monitor is achieved by simply pressing <Enter> (↵).

FASTNet Password Access

If the Model 2540 CPU DIP Switch C1 = B, the FASTNet password function is enabled. This function prevents unauthorized access to the FASTNet database via modem communications. When enabled, the FASTNet is programmed with a password. The password must be programmed into the Fastbase database, *and* separately into the TCE database.

Enter the password into the TCE database by selecting Other / Change TCE Password from the main menu. Follow the on-screen directions.



Note:

The Fastbase other, change Fastbase password function should be changed simultaneously to be consistent with the password programmed for the TCE. Remember, only one password exists in the FASTNet Switch.

The FASTNet password (*residing in the Model 2540*) can be changed in two ways:

- from TCE select Comm / Other / [select node ... dialup ... etc.] / Change Password
- from Fastbase select Commnet / Other / [select node ... dialup ... etc.] / Change Password



Caution:

Exercise care when using the password feature. It is possible for Fastbase and the TCE to have different passwords programmed into their databases, even if both are installed in the same directory. Since *the Model 2540 can only contain one password*, one of the databases can be inadvertently locked out.

If the Model 2540 CPU DIP Switch C1 = A, then FASTNet is configured for no password. This feature has no effect.

Section 7. Trunk Card Editor

Overriding Password Lockout

In the unlikely event that Fastbase and TCE do not contain the correct password, send a technician to the node site, have them *set* DIP switch C1 = A and *reset* the Model 2540 CPU Card (to read the switch). Re-program the password, and then set the DIP switch, and reset the CPU card again.

Modem Setup for FASTNet Communications

If the system was setup to communicate via modem in Fastbase, the same custom modem string (if applicable) must be used in the TCE. Change the initialization string by selecting Other / Change PC Modem Params from the main menu..

Verification of Parameter Data

TCE can verify the parameter file contents against a node in the database. Select Files / Verify from the TCE main menu. Then select a node to compare the current directory's parameter files to the database. The 'number of' different entries is shown after the verify operation is complete.

Unlike Fastbase's verify operation, the TCE's verify does not store the parameter files into the database (Fastbase creates a "verified" node). If you wish to verify the Model 2540's parameter files, you must first get the files into the current directory using Comm, Retrieve, To Files. Then perform the verify operation.

The verify function supports *limited* verification of append file contents.

Figure 7-36 illustrates how the results of a verify operation are reported. In this example, two entries did not match and one entry did not agree with the card types selected for a group (the card types defined across a trunk group should match). If data matches, the message "**** No differences detected ****" is displayed.

```
STATUS
Explanation of results, Check TCE.AUD for detailed reporting:
Data - Actual data does not match between file and database.
Group - The data in the oparam.cds file indicates that a card's configuration
        does not match the data in another card of that group, including
        hidden fields. Typically occurs if card types are different for
        cards of one group.
*** Differences detected: Data=2, Group=1
Done -- Hit any key.
```

Figure 7-36. "Verify" Status Window for an Append File

PRINTING USING THE TCE

TCE prints selected database contents much like Fastbase does. Database information can be printed to an ASCII file for viewing with a text editor or to a printer connected to the computer.

Section 7. Trunk Card Editor

To print all or a portion of the database, select Nodes, Trunk Groups, or Cards from the Print menu. Follow the on-screen directions.

The print utility is useful for printing reference copies of the *basic* card or group configuration. To do this, choose "N", or No, when asked "Print Detail Information?".

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8. NETLINK

WHAT IS NETLINK?

Netlink is a customized version of Zetron's proprietary Zlink program for serial data communications with the Model 2540 FASTNet Switch. Netlink is a subset of Zlink, both programs communicate with a Model 2540 FASTNet or a 2000 Series paging terminal. The operations performed via Netlink are executed at the lowest FASTNet priority, and therefore may exhibit occasional delays.

NETLINK INSTALLATION

A complementary copy of "NETLINK.EXE" is included on each TCE Diskette, which is normally shipped along with Fastbase (one diskette). Netlink is installed automatically with the TCE. See Section 2.

STARTING NETLINK

To run Netlink, type the [netlink ...] command line as shown in Figure 8-1. Like all DOS commands, this must be executed from the "TCE" home directory, unless the "TCE" home directory is included in the computer's "PATH" statement (Refer to your DOS documentation).

Section 8. Netlink

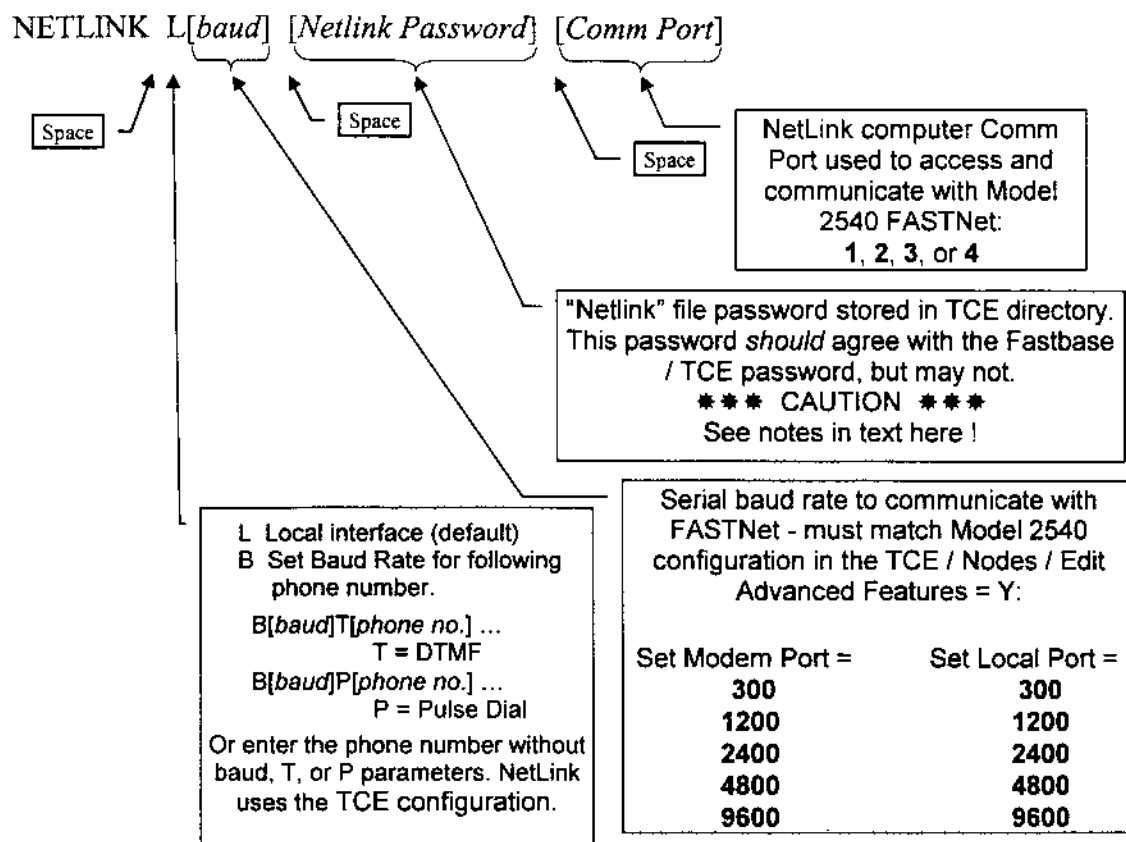


Figure 8-1. Local Netlink Startup Command Line

When communicating with the FASTNet Switch, Netlink supports Local or Modem data interfaces. The 4800 baud local interface is the default in TCE. The Netlink command line is *not* upper/lower case-sensitive, with the exception of the password entry.

Alternately, if it is necessary to communicate via modem to the FASTNet Switch, the Model 2540 supports 300/1200/2400/4800/9600 (default) baud communications. Netlink may be invoked by entering any one of the following command line formats at the office computer DOS prompt (also refer to Figure 8-1):

- netlink b9600t1234567 [password] 1
- netlink b2400p1234567 [password] 2

The first case sets the baud rate at 9600 and Touch-Tone (DTMF) dials the phone number "1234567" via Comm Port 1, assuming that the Netlink password was verified. The second case sets the baud rate at 2400 and pulse dials to phone number "1234567" via Comm Port 2, assuming that the Netlink password was verified.

Serial Communications Errors

When attempting to establish serial communication with the Model 2540, the Netlink software returns useful error messages. Most of these messages are self-explanatory.

If the error message "Cable not connected or attempting local connect via modem." is returned onscreen after a momentary delay, any one or more of the items listed below could have occurred:

- One or more parameter is missing from the command line ...
e.g. no baud rate following "b" command (see Figure 8-1), no password, etc.
- The specified Comm Port in the computer is not installed, is disabled, or possibly is the wrong type for the specified operation.
e.g. ...the RS-232 Serial Port was specified for an internal modem operation.
e.g. ...the internal modem port was specified for a "local" serial interface.
- Wrong baud rate specification ... refer to TCE / Nodes / Edit Advanced Features (Y), then look at Set Local Port or Set Modem Port , as appropriate.
- The Local Serial Cable is connected to the wrong Comm Port *jack*, or not connected at all.
- The Local Serial Cable wiring is defective or wrong. Verify that the correct Zetron serial cable (Part No. 709-7086) is installed.

Netlink Password Operation



Caution:

The password entry in the Netlink command line should be used with caution. It is very easy to inadvertently change the FASTNet password.

The operation of this field is FASTNet-dependent. If the Model 2540 CPU has DIP switch C1 set to "A", then the password requirement is disabled in the FASTNet Switch. Netlink initializes from the command line, and process the password in the following manner:

1. Establish data communications with FASTNet and retrieve the password previously archived into FASTNet memory.
2. Compare the previous Netlink password with the command line entry.
3. Save the new entry to the FASTNet archive if different.
4. System access is granted, proceed with Netlink operations at the "+" prompt.

When the FASTNet password is disabled, enter a set of double quotation marks (e.g. "") into the "password" position of the Netlink command line. A typical "local" Netlink execution is

Section 8. Netlink

shown below with a successful system access. Note the “+” prompt, indicating Netlink is booted and eagerly awaiting operator commands. Failure to enter a password results in an error condition, and aborts Netlink start-up.

```
C:\>netlink 14800 "" 1

-- ready
11may95 10:43:03a
+ pword l X
access free
+ pword p
+
```

If the Model 2540 CPU has DIP switch C1 set to “B”, then the correct password is required in order to access the FASTNet Switch CPU. In this mode, enter the *identical* password used for both Fastbase and TCE, since there is *only one password stored in the Model 2540 memory*. The password should be entered in UPPERCASE letters and/or numbers and can be up to a maximum of ten characters.

FASTNet Password Does Not Work

In the event that the FASTNet password has been lost, forgotten, or corrupted, follow this procedure to replace the password with a new password.

- ❑ 1. Send the service technician to the Model 2540 Main Chassis to place the CPU Card DIP Switch C1 into the “A” position. It is *NOT* necessary to re-boot the CPU Card, since the CPU scans this particular switch for status.
- ❑ 2. Access the FASTNet Switch either by Modem, or by local RS-232 interface, using one of these DOS command lines from the “TCE” directory of the computer:

Local RS-232 Interface:

```
netlink l[baud] [new password] [Comm Port #]
e.g. netlink 14800 LET_ME_IN 1
```

Modem Dial-up Interface:

```
netlink B[baud] T[M2540 tel#] [new password] [Comm Port #]
e.g. netlink B4800 T2068206363 LET_ME_IN 1
```

where

[baud] is the baud rate to communicate with FASTNet.

[new password] is the password to be stored into FASTNet. Use

caution: This must be in UPPERCASE letters, numbers, or with an underscore (_). Netlink is capable of installing other characters that TCE and Fastbase do not support!

[Comm Port #] is the Comm Port (of the computer being used) which must be accessed to establish “local RS-232” or “modem” communications with FASTNet.

- ❑ 3. A screen display similar to that shown in Figure 8-1 should be observed, except that the next to last line should read “+ pword p [new password]”. The last line is, of course, the Netlink “+” prompt.

- ☐ 4. Press the <Esc> key to terminate Netlink.
- ☐ 5. Access TCE / Other / Change TCE Password , and enter the new password.
- ☐ 6. Access Fastbase / otHer / change Fastbase password and enter the new password.
- ☐ 7. Set the CPU DIP Switch C1 to the “B” position to enable the password access restriction.
- ☐ 8. All of the FASTNet programs now have the same password. While the service technician is at the switch, it is a good idea to verify access from each of these programs, using the password.
- ☐ 9. Type “Q-”, “QUIT-”, or press the <Esc> key to terminate Netlink.

This concludes this procedure.

USING NETLINK TO SET TRUNK CARD LEVELS

This information is for the computer operator in the office, while the technician is performing the adjustments at the FASTNet site. There are two methods to set trunk card audio levels: the DTMF Overdial Access Method and the Local Computer Access Method. These methods are also described in the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260).

DTMF Overdial Access Method

The service technician can dial into FASTNet using a particular Node User ID, and the 4-digit Voice Prompts Security Code (previously configured by Fastbase). Then access to the “Test Tone” mode of the FASTNet Switch is granted by entering “999”. This method *must* be used for each DID trunk.

Local Computer Access Method

The service technician accesses the Model 2540 Main Chassis via the “local” RS-232 port at P2 of the lower backplane board. Then Netlink commands can be issued from the local computer to generate test tones, etc. The appropriate serial cable (Part No. 709-7086) is shipped with the FASTNet Switch. *This procedure cannot be used for DID trunks.*

This procedure involves specific Netlink commands. Care must be taken not to inadvertently enter random character strings at the “+” prompt, since unexpected results may possibly be catastrophic. Be absolutely sure that the Netlink command strings are correct before pressing the <Enter> (↵) key. Local computer access is established as follows:

- ☐ 1. At the FASTNet site, connect the “local” computer to the Model 2540 Main Chassis lower backplane connector P2 with an 709-7086 or equivalent RS-232 serial cable.



Note:

FASTNet serial protocol requires the Carrier Detect (CD) and Data Terminal Ready (DTR) lines for communication flow control. The data link cannot function if these pins are not properly wired.

- ❑ 2. Invoke Netlink by typing:

`netlink l[FASTNet Baud] [FASTNet password, or ""] [PC Comm Port] ↵`

e.g. `netlink l4800 LET_ME_IN 1 ↵`

- FASTNet should return a few lines of information followed by a "+" prompt.

Example of "no password required" data link:

```
-- ready
11may95 10:43:03a
+ pword l X
access free          (This indicates no password required)
+ pword p X
+
```

Example of "password required" data link:

```
-- ready
11may95 10:43:03a
+ pword l X
access granted      (This indicates password accepted)
+
```

- ❑ 3. Type the Netlink dual trunk card test configuration command:

`setup [ttu] [tel#] [d] ↵` where;

`[ttu]` tt = Trunk Card Address

 u = A or B for specific trunk to be adjusted

`[tel#]` = Telephone number for the specified trunk to dial out in
 order to connect to a "quiet termination"

`[d]` = Dialing protocol to be used DTMF, MMF, or Pulse

e.g. `setup 05B 7654321 D ↵` ; DTMF dials 765-43211 out trunk 5B



Note:

Any number of trunks can be simultaneously *setup* in this manner.

- ❑ 4. After the trunk is connected to the quiet termination line, generate the 1 kHz test tone from the 'last addressed' trunk by typing "TONEON↵". The trunk remains connected and generating the 1-kHz test tone until directed otherwise.

For enabling test tone output for a specific trunk, type:

“TONEON *[ttu]* ↵” ; where *[ttu]* = trunk address + A/B



Note:

The trunk must be *setup* first. See Step 3, above.

- ☐ 5. At this time the, the technician must adjust trunk levels at the Model 2540 Switch.
- ☐ 6. Type “TONEOFF” to turn the test tone output off for the last trunk addressed, or type “TONEOFF *[ttu]* ↵” to turn off test tone for a specific trunk address (*[ttu]*).



Note:

Steps 4 and 5 can be repeated as many times as needed to turn the Test Tone on/off while servicing the trunk card.

- ☐ 7. Type “HANGUP *[ttu]* ↵” to terminate the Trunk Card call established by “setup”, where *[ttu]* is the Trunk Card address + A/B.

This must be performed for *each* trunk which was “setup”.

“HANGUP ↵” terminates the call for the trunk card that was addressed last.

Use caution: This hangs up the specified trunk. If the trunk card is incorrectly specified, it is possible to terminate a customer’s conversation.

- ☐ 8. Type “Q” or “QUIT” or press <Esc> to quit Netlink.

NETLINK COMMAND SET FOR MODEL 2540

This subsection contains the Netlink system commands. Zetron recommends that only *advanced-skilled* computer personnel use the Netlink programming functions.



Caution:

FASTNet difficulties, failures, or billing data losses can result from improper Netlink access to the Model 2540 CPU.

Command	Opts/Parms	Description
[?]	none	Gives a "quick help" summary list of the system commands.
[.]	none	Logs Off FASTNet without terminating Netlink. Use [Q] or [QUIT] commands instead.
[CARDS]	none	Display the current card configurations.

Example display:

#	Units	ROM	Type	Restart	File	Version
7	0 0	6 0	D - -	D 0	2tv26f2.img	...
8	2 2	6 3	U P R	A 1	2tv26f2.img	2540 Series Dual Trunk V26F2, 7/20/93
9	0 0	6 0	D - -	D 0	2tv26f2.img	...
10	0 0	6 0	D - -	D 0	2tv26f2.img	...
11	0 0	6 0	D - -	D 0	2tv26f2.img	...
12	2 2	6 3	U P R	A 1	2tvfn6f1.img	2540 Series Dual Trunk VFN6F1, 2/25/93
13	0 0	6 0	D - -	D 0	2tv26f2.img	...
14	0 0	6 0	D - -	D 0	2tv26f2.img	...
15	2 2	6 3	U P R	A 1	2tvfn6f1.img	2540 Series Dual Trunk VFN6F1, 2/25/93
16	0 0	6 0	D - -	D 0	2tv26f2.img	...

Restarts this trunk card has experienced ...
Alive / Dead status of card.
Ready, following .img file load.
Programmed .img file successfully.
 Card is Up (online) or Down (offline).
 Card Type ID number.
 ROM version installed.
 Number of *functioning* units on trunk card.
 Number of units on Dual Trunk card.
 Card address number as read from DIP SWs & JP5

Command	Opts/Parms	Description
[CD]	none	Displays the current directory contents... which is the working directory - C:\ZDIR> ***** WARNING ***** DO NOT USE THIS COMMAND - YOU COULD KILL FASTNet
[CLEAR]	MSGBEEP ROAMER MESSAGES	MSGBEEP- Clears all messages for a given site. ROAMER- Clears all roamers on a given site. If a user ID is specified, the that user's route is reset to the default route in the user record. Example: clear roamer 2 8206363. This resets roamer 8206363 on site 2 to the default route. MESSAGES- Clears all messages for a given site. If no site given it clears all messages for all sites. Example: clear messages 2. Clears all messages for site 2.
Example parameters:		
usage: CLEAR <MSGBEEP,ROAMER,MESSAGES> <SITE #> [USER]		
[CLREOS]	none	Clears to end of screen.
[CLS]	none	Clears the remote terminal screen. Is not valid when logged in with a keyboard and monitor.
[COPY]	source_spec [dest_spec]	The copy command lists the file size, in bytes, and then the file name. It then attempts to copy the file and prints the results along the right hand side of the line. If the copy succeeds, this will just be the path and file name copied to. Otherwise an error message will be displayed.
[COUNT]	Trunk Group	Shows how many trunks are in use for a specific Trunk Group. If the Trunk Group doesn't exist, a "-1" will show for trunks in use. Example: + count 0 Trunk Group 0 has -1 trunks in use + count 1 Trunk Group 1 has 0 trunks in use
[CPA]	usage: cpa [call counts operation] (c)urrent (o)ld (r)ollover (s)ee (d)elele (t)ime	Gets call accounting information from M2540. get current counts get previous counts start new period, get previous counts get subscriber counts get and clear subscriber counts display billing time
[DATE]	mm-dd-yy ddmmyy	See and/or set the date in the M2540. Enter just the command to view current date and not to change it. Or, enter command and the date in either of the two formats to change the current date.
[DEBOOT]	none	Prompts for user to make sure. Reboots the M2540 when all of the trunks become inactive.
[DEL]	Filename \direct\file	Delete specified file.
[DF]	X Example Display: C: bytes: 8028160 used 8988672 free	Disk free space on drive X. Defaults to main drive.
[DIR]	none, or file mask	Display the directory contents - non-voice files. See [LS] for details.

Section 8. Netlink

Command Opts/Parms Description

[DISKIO] none Diagnostic to check disk read/write errors.

Example display:

Disk I/O since 28dec94 12:52:58a

DOS	total	read	total	write
drive	reads	errors	writes	errors
C:	13	0	0	0

Disk I/O since last reboot

DOS	total	read	total	write
drive	reads	errors	writes	errors
C:	3383	0	375	0

[ERASE] filename Erases a file. See [DEL].
 \directory\file

[FILES] none Diagnostic that shows information on open files.

Example Display:

file #	handle	# chars	flags
0	0	0	READ
1	1	511	WRITE
2	2	0	WRITE UNBUF

[GET] Filename Get a copy of filename from M2540. If you just specify the filename it will arrive as filename.

File1 File2 To get file1 from M2540 and name it file2 on the office computer.

[GETSUB] ID# filename Gets user record via serial link and places it in FILENAME.

Example Display:

```
+ getsub 6851900
334 bytes
Upload of Site user file: complete
334 bytes
Upload of Node user file: complete
```

[HANDLES] none Diagnostic that shows open files.

Example Display:

handle	mode	name
0	0	stdin
1	1	stdout
2	1	stderr
3	2	log08
4	2	fastnet.bin
5	2	siteuser.bin
6	2	cnts2540.cnt
7	0	\english.arf
8	2	smdrfile

[HANGUP] Trunk Card Hangs up specific Trunk.

Example Display:

```
+ hangup 1a
Invalid trunk 1A
```

[HEAD] Filename Show first part of file in screen.
 -a Show the whole file.

Command	Opts/Parms	Description
[HEAP]	-v Example Display: total heap: 136928 remaining: 80736 number of fragments 4 total free 5045 smallest 19 largest 4951	Diagnostic showing a software statistic. -V gives additional diagnostics.
[HELP]	none	Same as [?].
[LASTBOOT]	none Example Display: V(fn310H93) Aug 12 1994 12:28:24 up at 9apr22 12:00:00a	Shows when system was last rebooted.
[LIU]		Display trunk card activity.
	-a -g -i -o -s	Active trunks only. display Group trunk information. Inactive trunks only. show Override information. show State information (default).
[LOADCARD]	usage : where cardlist -c config -p param	loadcard -- load IMG files into cards is a list of card numbers to load or a * to load all cards in config file is used to set the card config file to other than CONFIG.CDS is used to set the oparam file to other than OPARAM.CDS
[LOG]	none Example Display: a--- 28dec94 1:07 5518 log08	Prints name, size, and time stamp of the current log file. Also flushes current log cache.
[LS]	/a /d /h /l \directory /r /t /u /v /c	Displays the M2540 non-voice files. All files, including hidden files. Subdirectory - no detail. Help information. Long form directory display. Select particular directory. Show in reverse name or time order. Show in date and time order. Unalphabetized, first file (DOS) first. Verbose. Of display files - total number and total size.
[MAILBOX]	NodeUser #	View contents of owner files. Diagnostic command.
[MD]	Directory	Make new subdirectory "directory" on the M2540.
[MONITOR]	none	Allows viewing of real-time system operation.
[MOVE]	Old_Spec New_Spec	The move command will change the directory a file or files are in. The original directory and the name or names of the files to move is given by Old_Spec, which may include a path and may have wildcards in the filename in order to specify more than one file. The new directory is given by New_Spec, as any filename is ignored just the new directory name need be given. If either specification does not include an explicit path, the current directory (C:\ZDIR) will be assumed. If the source and destination paths do not differ, then an error message will be displayed and no files will be affected. After all files are processed, the total number of files affected will be displayed.

Section 8. Netlink

Command	Opts/Parms	Description
[OPTIONS]	none	Displays M2540 options list.
Example Display: Current options level: B Order Number 1 Node 1 4 Hours of Voice Messaging with 4 Voice channels 5000 Max Users, 4 Max Radio sites, 4 Max FASTNet Nodes Call waiting is enabled Netview Display is enabled Local printer is disabled		
[PCM]	none	Displays use/status of pcm channels.
[POLL]	none	Diagnostic that shows the peripheral cards being scanned. Press ENTER to get out of this.
[POST]	source_file dest_file	<i>This is only used by Fastbase. DO NOT try to use it!!</i> Posts database contained in source file name to a destination file name on the switch.
[PUT]	Filename File1 File2	Put a copy of filename from the office computer to M2540. Put office computer file1 onto M2540 and name it file2. Full file path names can be used.
[PWORD]	1 password p password	Password to log on to the M2540. Must use this command when Netlinking to M2540. The p option changes the password. Must be done after logging in. The correct way to change the password is to used the proper option in Fastbase.
[Q]	none	Quit Netlink. See [QUIT]. The ESC key will also quit Netlink.
[QUIT]	none	Quit Netlink. See [Q]. The ESC key will also quit Netlink.
[QUITSW]	none	Quits the software out to the DOS prompt. This command is only allowed via the keyboard.
[RD]	directory	Remove an existing subdirectory named "directory".
[REBOOT]	none	Reboot the M2540. Stops all system activity. It will be several minutes until the M2540 becomes active again!
[REN]	Old_Spec New_Spec	The rename will change the name of a file or files. The original name or names of a file is given by Old_Spec, which may include a path and may have wildcards in the filename in order to specify more than one file. The new filename is given by New_Spec, as any path is ignored, just the new filename need be given. If the source and destination names do not differ, then an error message will be displayed and no files will be affected. After all files are processed, the total number of files will be printed.
[REPEAT]	Command	Repeats the command until <ENTER> key is hit. - - - For testing applications only - - -
[STATS]	none	This command can be only used from Fastbase. It gets the statistics from the FASTNet.

Command	Opts/Parms	Description
[SEARCH]	Usage: Search <string> <-opts> <file(s)> -f -h -i -n -o<c> -r -t	Allows you to search a file for a particular string. is any string you want to search for the case is not important - no spaces allowed options for the file name wild cards - see below is one or more file names - wild cards O.K. Filter files by Attributes, Extension, Name, Size, Time. () Give a screen of 'help' information. () Interactive mode, prompt Yes/No for each file. () Noninteractive mode, process all files as a group. () Select sort field. Choice of fields is Attributes, Extension, Name, Size, Time, Unsorted.(U) Reverse default sorting order. () Sorts by time stamp - newest to oldest.
Example Usage: To see all the calls (in the log files on the switch) that are to and from a user who has FASTNet ID 8206363, enter: Search 820-6363 log* -rot		
[SET]	Usage: SET <filename>	Set operating conditions without rebooting. Filetype is as follows; filename defaults to name shown if it isn't specified: '(file)' is optional, commands and (default files) are : trunks (TRUNKS.CUS) options (OPTIONS.CUS) oparam (OPARAM.CDS) asp (FILES.ASP) class (FILES.CLS) lcr (FILES.LCR) site (FILES.SIT)
[SETUP]	usage: setup TTNt <phone#> <dial method>	TT = trunk number, N = A or B side, i.e. 17A t = command called repeater controller to turn it test tone on, i.e. 18Bt <phone number> optional phone number to dial <dial method> optional dialing method D = DTMF, P = Pulse, M = MF, DTMF dialing is default Other Commands: toneon TTN {busy, dial, whoop, ring} default 1000 kHz toneoff TTN - turns current tone off hangup TTN - hangs up current trunk
[SLEEP]	seconds	Puts the console task to sleep for the specified number of seconds. <i>For engineering use only! DO NOT use it.</i>
[SMDR]	none	This command can only be used from Fastbase. It gets the SMDR records from the FASTNet.
[SNAP]	none	Takes a snap-shot of the task control block structures. Makes sense for engineering only.
[SOFTVER]	none	Displays programming software support versions for Fastbase and TCE.
Example Display: Programming Software Support: Fastbase 6.17 TCE n6f1		
[SPECIAL]	none	Opens and displays a special.txt file. Engineering only.
[TAIL]	filename n	Displays the tail end of filename for n lines. Default is 20 lines.

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Command	Opts/Parms	Description
[TASKS]		Diagnostic showing information about currently executing tasks on the M2540.
	-b	Brief task list, one line per task.
Example Display:		
+ tasks		
8E7E:0008 - " cron" 4265:002C 0246		
SS 8E81 SP 03A8 base: 0008 warn: 0108 top: 03F0 max: 035A		
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000		
AX 1F29 BX 03DE CX 8FDF DX 1C32		
SI 000E DI 0131 BP 03E6 DS 6058 ES 8E81		
8E55:0008 - " watchdog" 4265:002C 0206		
SS 8E58 SP 0256 base: 0008 warn: 0108 top: 0260 max: 0216		
0000 0000 0000 0000 0000 5F04 5D5E 0003 F151 0008 8E55 0008 8EC0 72D2 6058		
AX 034D BX 0008 CX 0000 DX 0370		
SI 0000 DI 0000 BP 0256 DS 6058 ES 8E58		
8D44:0008 - " comm_task" 4265:002C 0297		
SS 8D47 SP 0726 base: 0008 warn: 0108 top: 07D8 max: 06B0		
0256 0024 0000 0144 2600 9473 FFC7 0000 0001 00E6 0001 0009 0731 8D47 07BA		
AX 0000 BX D5F2 CX 01BD DX 03EE		
SI 0002 DI 03EB BP 0742 DS 6058 ES 5941		
8CC9:0008 - " Dispatcher" 4265:002C 0246		
SS 8CCC SP 0770 base: 0008 warn: 0108 top: 0774 max: 0730		
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0003 F151 0008 8CC9 0008		
AX 0000 BX 0008 CX 000F DX 1743		
SI 0000 DI 0000 BP 0000 DS 6058 ES 8CCC		
8C87:0008 - " voice DMA" 4265:002C 0246		
SS 8C8A SP 03D0 base: 0008 warn: 0108 top: 03F0 max: 037A		
0000 0680 B671 00F4 5941 8000 0006 0010 8C3F 00F0 6008 0000 0000 0000 0000		
AX 0000 BX 592D CX 003F DX 0000		
SI 0010 DI 0000 BP 03E6 DS 6058 ES 6058		
8C06:0008 - " pager notify" 4265:002C 0246		
SS 8C09 SP 06AE base: 0008 warn: 0108 top: 07D8 max: 066E		
6058 07CE 1898 51BB 03E8 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000		
AX 0000 BX 592D CX 0DE3 DX 4265		
SI 03E8 DI B6B3 BP 06B0 DS 6058 ES 6058		
8BB7:0008 - " Statistics" 4265:002C 0246		
SS 8BBA SP 045C base: 0008 warn: 0108 top: 04B8 max: 041C		
6058 04AE 0030 33DB 03E8 0000 0000 264A 5941 2662 5941 0000 0000 0000 0000		
AX 0000 BX 592D CX 0DE3 DX 4265		
SI 03E8 DI B6B3 BP 045E DS 6058 ES 8BBA		

```

8B6D:0008 - "      Device Message" 4265:002C 0246
SS 8B70 SP 0438 base: 0008 warn: 0108 top: 0470 max: 03C0
6058 0466 0E99 51BB 0064 0000 0000 0000 0000 0000 0000 0000 0000 0000
AX 0000 BX 592D CX 0DE3 DX 4265
SI 0064 DI BA27 BP 043A DS 6058 ES 5941

8AEC:0008 - "      Message Beep" 4265:002C 0246
SS 8AEF SP 0636 base: 0008 warn: 0108 top: 07D8 max: 05F6
33AF 554C 6058 0000 0793 0000 07CE 2349 BA6F 077E 8AEF 8640 0000 07CE 23C1
AX 0000 BX 592D CX 2300 DX 0000
SI 0000 DI 0793 BP 0650 DS 6058 ES 5941

861A:0008 - "      Trunk Task 1" 4265:002C 0246
SS 861D SP 09CE base: 0008 warn: 0108 top: 0A94 max: 0700
00C2 09E8 0797 441C 0782 5941 0782 5941 0782 5941 0BB8 0000 6058 09FA 04D9
AX 0000 BX 048C CX 00C2 DX 02C8
SI 0008 DI 0A72 BP 09D0 DS 6058 ES 5941

+ tasks -b
TCB   Name           . CS:IP Flags SS:SP base warn top max
8EC0:0008 _mt_main      0669:0988 0A14 8EC3 0988 0008 0108 0FA8 0640
8E7E:0008 cron          4265:002C 0246 8E81 03A8 0008 0108 03F0 035A
8E55:0008 watchdog      4265:002C 0202 8E58 0256 0008 0108 0260 0216
8D44:0008 comm_task     4265:002C 0246 8D47 0726 0008 0108 07D8 06B0
8CC9:0008 Dispatcher    4265:002C 0246 8CCC 0770 0008 0108 0774 0730
8C87:0008 voice DMA     4265:002C 0246 8C8A 03D0 0008 0108 03F0 037A
8C06:0008 pager notify  4265:002C 0246 8C09 06AE 0008 0108 07D8 066E
8BB7:0008 Statistics    4265:002C 0246 8BBA 045C 0008 0108 04B8 041C
8B6D:0008 Device Message 4265:002C 0246 8B70 0438 0008 0108 0470 03C0
8AEC:0008 Message Beep  4265:002C 0246 8AEF 0636 0008 0108 07D8 05F6
861A:0008 Trunk Task 1  4265:002C 0286 861D 09C4 0008 0108 0A94 0700

```

Section 8. Netlink

Command	Opts/Parms	Description
[TEMP]	none Example Display: Temperature reading : 32 C, 89 F	Shows temperature on the FASTNet terminal.
[TIME]	hh:mmx hh:mm:ssx	See and/or set the time of the day on the M2540. Type the command without the options to view current time. Hours:MinutesX, where X is a for am or p for pm. Hours:Minutes:SecondsX, where X is a for am or p for pm.
[TONEON]	<i>trunk</i>	Turns on a 1-kHz tone on the specified trunk. For example: toneon 1A turns on a 1-kHz tone on card one, unit A.
[TONEOFF]	<i>trunk</i>	Turns off a 1-kHz tone on the specified trunk. Same convention as toneon.
[TRAFFIC]		Display system activity currently happening on the M2540. Press RETURN or ENTER to exit Traffic mode.
	-a -e -i -x -f -r	Include All postings. (default) Include only Error postings. Include selected postings. Exclude selected postings. Flush current traffic lines. Restore current traffic lines.
[TYPE]	filename	Types a text file from the M2540 to the screen.
[VDEL]	filename	Delete a voice file or list of voice files.
[VER]	none	Displays the version of software on the M2540.
Example Display: [Zetron] V(fn310H93) Aug 12 1994 12:28:24 with DOS 3.31		
[VGET]	Filename File1 File2	Get a copy of voice filename from M2540. If you just specify the filename it will arrive as filename. To get file1 from M2540 and name it file2 on the office computer.
[VHANDLES]	none	Number of voice file handles in use and by whom.
[VLS]	none	Display the voice files. See LS above.
[VPUT]	Filename File1 File2	Put a copy of voice filename from the office computer to M2540. Put office computer file1 onto M2540 and name it file2. Full file path names can be used.
[VR]	none	Displays status of voice resources / channels.
[VSTATS]	none	Displays voice storage statistics. e.g. used storage, remaining storage, etc.

9. VOICE PROMPTS	9-1
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9. VOICE PROMPTS

OVERVIEW

The system voice prompts (standard) and the Call Saver Voice Messaging option equip the Model 2540 FASTNet Switch to play high quality verbal prompting messages in addition to the standard beep tones. These system voice prompts are high fidelity recorded prompts; they are *not* synthesized. Therefore, you can use any language or dialect you choose.

The FASTNet Switch voice system stores the prompts in permanent hard-disk files. In addition, you can record custom system prompts, and FASTNet users can record personalized greetings at any time by telephone. Special password access guarantees security.

Parameters in Fastbase set prompting for individual users for system or user prompts. Knowledgeable callers can bypass (override) voice prompts by pressing a voice menu command on their telephone.

The Model 2540 FASTNet Switch is shipped with system voice prompt files recorded at the Zetron factory. These files are recorded in English by a female resident of the Western United States. You may wish to replace these prompts with something more appropriate to your region or country. When you record new voice prompts, the factory defaults are erased.



Caution:

If a new system voice prompt is recorded, the factory-supplied system voice prompt is gone. You have recorded over it and cannot get it back.

FASTNET USER PERSONALIZED GREETINGS

This feature comes with the Call Saver Voice Messaging option. As an add-on to the Model 2540 FASTNet Switch, the user personalized greetings allow specific FASTNet users to record their own voice greetings into the Model 2540 for callers to hear. Fastbase settings enable and disable this feature on a per-user basis.

With Call Saver Voice Messaging, FASTNet users have truly customized service. Each user can have personalized voice greetings (depending upon messaging modes enabled in the user database) for message box and announcement. Callers hear the FASTNet user's own voice greeting when calling in to deposit a message or to hear an announcement. Whenever users change messaging modes, the appropriate voice greeting is automatically activated. There is no need to re-record greetings. This feature saves telephone trunk time and is easy to use.

Section 9. Voice Prompts

The message box greeting is used for message box mode. This greeting conveys to the caller that his/her voice message will be stored for later retrieval by the FASTNet user. If the user has message beeps, then he/she might say that he/she will be notified by radio. For a message box with message beeps, the user might say, "This is ____ and you have reached my voice message box. At the tone, tell me what you require."

The announcement greeting is just that: an announcement that is played to callers whenever the FASTNet user is in Announcement mode. No message recording or message beeps are performed. A user might use this greeting when he/she is unavailable: "This is Sue and I am unavailable at this time. Ed is taking my calls at 555-1111."

To record new personalized greetings, FASTNet users can use a Touch-Tone telephone and access the FASTNet Voice Menu. See the FASTNet User Access subsection at the end of this section for details.

VOICE TIME STAMP

The speech used for the time stamp with Call Saver Voice Messaging is recorded at the factory and cannot be changed in the field. Different languages are available. Contact Zetron for more information.

RECORD, PLAY, ERASE VOICE PROMPTS

- ☐ 1. Using the Fastbase database manager, select EditNet, Node Config. Select the Pop-Up System Voice Prompt Window field and enter Y. Choose a FASTNet phone number in the database to use for special access to the voice prompt subsystem. Set up this FASTNet phone number with the following:
 - ☐ a. Enter the FASTNet phone number. This phone number cannot be used for a regular FASTNet user's phone number.
 - ☐ b. Set the Security Code field to a four-digit number that you can easily remember. This number is keyed on a Touch-Tone phone for password access to recording.
 - ☐ c. Set the Voice Limit field to the maximum length of any prompt you are going to record (a good value is about 60 seconds).
- ☐ 2. In Fastbase select CommNet, Update, Node Config to update these changes to the Model 2540 FASTNet Switch.
- ☐ 3. Using a Touch-Tone telephone:
 - ☐ a. Dial the Prompt access telephone number.
 - ☐ b. The system plays, "Enter the system prompt passcode" followed by 1 long and 4 short tones. Enter the 4-digit security code.

- ☐ 4. The system plays, "Select a voice prompt" followed by a single prompt tone. Choose to record, play, or delete a voice prompt. Make a selection using a three-digit Voice Command Code (Table 9-1.):
- Codes 001 to 299: record new prompts (records *over* the factory prompts!)
 - 301 to 599: play existing prompts
 - 601 to 899: delete existing prompts
 - 999: play special test tone for balancing the telephone interface card hybrids.

The column labeled "Zetron Wording" in Table 9-1 is the wording used in the Zetron factory default prompts shipped with the machine. This wording is carefully chosen so as to blend prompts together smoothly; so reword prompts with caution.

- ☐ a. Key a three-digit voice command code as shown in the Table 9-1.
- ☐ 5. To record a voice prompt, the FASTNet Switch gives a single beep. Then speak your new prompt; be sure to wait for the beep. To get the cleanest sound, be in a room without background noise. Some people have professional announcers do these prompts. The best sounding recordings are made with Silence Compression turned ON (all voice cards are configured this way when shipped). At the end of a recording, be quiet while holding your hand over the handset to let the recording time out. The silence compression trims the voice to just the right length, eliminating any unused time at the end of the recording.

After the prompt has been recorded, five short beeps and the "Select a voice prompt" are played again. Now play, record or delete a prompt, or hang up recording is complete.

Section 9. Voice Prompts

VOICE COMMAND CHART

The Voice File Name shown in Table 9-1 is provided as a reference.

Table 9-1. Voice Command Summary

Command ## *			Zetron Preferred Wording	Voice File Name
Rec	Pla	Del		
	300		Play all voice prompts	
001	301	601	System Welcome "Welcome to FASTNet voice messaging system."	sys_welcome
002	302	602	Voice message "At the tone, please speak your message."	sys_vmsg
004	304	604	Thank you "Thank you for calling ABC Paging."	sys_thankyou
006	306	606	Calls routed to "Calls routed to"	calls_routed
007	307	607	Security code (for accessing user) "At the tone, enter the security code."	security_code
008	308	608	Personal passcode "After the tone, key in your personal passcode."	passcode_input
009	309	609	Main menu "FASTNet Main Menu. At the tone, key in your command or press zero for help."	activity_input
010	310	610	Bad number prompt "The number you have dialed is not in service"	bad_number
011	311	611	System prompt passcode (for voice prompt access) "At the tone, enter the system prompt passcode."	security_input
012	312	612	Select voice prompt (for voice prompts) "At the tone, select a voice prompt."	ptype_input
013	313	613	Speak voice prompt (for voice prompts) "At the tone, speak the voice prompt."	prompt_input
014	314	614	Enter phone number "Enter phone number."	enter_phone
015	315	615	Personal voice messaging greeting "At the tone, speak your voice messaging greeting."	saver_greeting
016	316	616	Personal announcement greeting "At the tone, speak your announcement."	announcement
017	317	617	Message box full "This user's voice messaging is full. Your message will not be saved. Please call back later."	sys_full
018	318	618	No messages "You have no messages"	no_msgs
019	319	619	No more messages "You have no more messages"	no_more_msgs
020	320	620	Erase/Keep message box message "Press 3 to erase this message or 5 to keep it"	play_save

* Use of these "Command ##" codes are detailed in Step 4 on page 9-3.

Table 9-1. Voice Command Summary, Continued

Command ## *			Zetron Preferred Wording	Voice File Name
Rec	Pla	Del		
021	321	621	Announcement menu "Announcement menu. At the tone, key in the announcement command or press zero for help."	greeting_input
022	322	622	Incorrect command code "You have keyed an incorrect code; press 0 for help. If you require further assistance, hang up and call _____."	bad_input
023	323	623	Reset to default site "Your calls are now routed to your default site."	now_default
024	324	624	Receive calls on radio "Your calls are now routed to your mobile phone."	now_radio
025	325	625	Calls to voice messaging "You are now routed to voice messaging."	now_mbox
026	326	626	Calls to announcement "Your calls are now routed to your announcement message."	now_annc
027	327	627	Enter Yes / No "Press nine for YES, seven for NO."	yes_no
028	328	628	Main menu help "FASTNet feature access help. To retrieve your messages, press one. To receive calls on your mobile phone, press two. To route calls to voice messaging, press three. To route calls to announcement only, press four. To restore routing to default site, press five. To change routing to a different site, press six. To route all calls to another number press seven. To record announcements, press eight. To access call forwarding menu, press nine."	help_main
029	329	629	Announcement menu help "Announcement record play help. To record your voice messaging greeting, press one. To play back your voice messaging greeting, press two. To erase your voice messaging greeting, press three. To record your announcement message, press four. To play back your announcement message, press five. To erase your announcement message, press six. Press zero for help. Press * for main menu."	help_greeting

* Use of these "Command ##" codes are detailed in Step 4 on page 9-3.

Section 9. Voice Prompts

Table 9-1. Voice Command Summary, Continued

Command ## *			Zetron Preferred Wording	Voice File Name
Rec	Pla	Del		
030	330	630	Busy forward "All BUSY calls forwarded to"	busy_forward
031	331	631	No answer forward "All no answer calls forwarded to"	no_ans_forward
032	332	632	Busy forward off "BUSY forwarding is now disabled."	busy_off
033	333	633	No answer forward off "No answer forwarding is now disabled."	no_ans_off
034	334	634	voice messaging "Voice messaging"	voice_mess
035	335	635	Invalid site "Your account is not enabled for this site."	invalid_site
036	336	636	Call forwarding menu "Call forwarding menu. After the tone, key in your forwarding selection command or press zero for help."	callf_menu
037	337	637	Call forwarding help "Call forwarding help To turn off 'No answer' forwarding, press one. To 'No answer' forward to voice messaging, press two. To 'No answer' forward to another number, press three. To turn off BUSY forwarding, press four. To BUSY forward to voice messaging, press five. To BUSY forward to another number, press six. To verify current forwarding, press seven. Press zero for help. Press * for main menu."	callf_help
038	338	638	Not Enabled "Your account is not enabled for this feature."	not_enabled
040	340	640	Call Forwarded "Please wait, your call is now being forwarded."	
041	341	641	All Circuits are Busy "Were sorry all circuits are busy, please try again later"	gp_p1
042	342	642	Mobile did not answer "Were sorry the mobile telephone you called did not answer"	gp_p2
043	343	643	Enter over dial digits - 4 "Enter the four digit number of the mobile telephone you wish to call"	gp_p3
044	344	644	Enter number again - 4 "You have dialed less than four digits, please try again"	gp_p4

* Use of these "Command ##" codes are detailed in Step 4 on page 9-3.

Section 9. Voice Prompts

Table 9-1. Voice Command Summary, Continued

Command ## *			Zetron Preferred Wording	Voice File Name
Rec	Pla	Del		
045	345	645	Enter over dial digits - 3 "Enter the three digit number of the mobile telephone you wish to call"	gp_p5
046	346	646	Enter number again - 3 "You have dialed less than three digits, please try again"	gp_p6
047	347	647	Enter over dial digits - 2 "Enter the two digit number of the mobile telephone you wish to call"	gp_p7
048	348	648	Enter number again - 2 "You have dialed less than two digits, please try again"	gp_p8
049	349	649	Enter over dial digits - 5 "Enter the five digit number of the mobile telephone you wish to call"	gp_p9
050	350	650	Enter number again - 5 "You have dialed less than five digits, please try again"	gp_p10
051	351	651	General purpose prompt 11.	gp_p11
◇	◇	◇	◇	◇
◇	◇	◇	◇	◇
◇	◇	◇	◇	◇
070	370	670	General purpose prompt 30.	gp_p30
071	371	671	System load management. "Your call cannot be processed at this time. Please try again later."	load_mgmt
072	372	672	System error. "Your call cannot be processed. Please call _____ to report the problem."	sys_error
073	373	673	Enter site number "Enter site number to route calls to. Press zero for a list of sites"	enter_site
074	374	674	Toll restrict on forward "Your account is toll restricted for this number"	fwd_toll_restrict
075	375	675	Incomplete Number dialed "You have dialed a incomplete number, please hang up and try again"	incomplete_num
076	376	676	Messages "You have messages"	have_mail
077	377	677	Please wait Dispatch Network Setup "Please wait call is being connected"	please_wait

* Use of these "Command ##" codes are detailed in Step 4 on page 9-3.

Section 9. Voice Prompts

Table 9-1. Voice Command Summary, Continued

Command ## *			Zetron Preferred Wording	Voice File Name
Rec	Pla	Del		
078	378	678	ALL Network Sites connected "Proceed, all sites connected"	all_sites
079	379	679	Some Network Sites connected "Proceed, some sites not connected"	some_sites
101	401	701	Radio Site name 1 "Site Name."	site1
◇	◇	◇	◇	◇
◇	◇	◇	◇	◇
◇	◇	◇	◇	◇
199	499	799	Radio Site name 99 "Site Name."	site99
	999		Plays Test Tone to set telephone balance and levels for inbound and outbound trunks	—

* Use of these "Command ##" codes are detailed in Step 4 on page 9-3.

FASTNET USER ACCESS

Depending upon what features have been activated for a FASTNet user, the user can access a voice menu and retrieve messages, change call forwarding, etc. The following list describes what is available in the Voice Menu and how to access it. The steps described are for accessing the menu from a touch-tone telephone. To access the Voice Menu from a mobile, dial the FASTNet phone number for that mobile and the FASTNet Switch prompts for the user's passcode if the passcodes are turned on.

User Voice Access Method

- ☐ 1. User calls his/her normal seven-digit phone number
- ☐ 2. During ringing or user's voice messaging greeting prompt, user presses '0', this places user into owner access. At this point, user enters passcode, if passcodes are turned on for the user. To record or rerecord the announcement for a CALLERD scripted number, the user enters the passcode for the base number (see "Node Users, Script User Type, CALLERD Script" in Section 4, "Setting Up a Database").

- ☐ 3. User access menu is as follows:

Main Menu	
<input type="checkbox"/> 1	Retrieve messages
<input type="checkbox"/> 2	Receive calls on mobile phone
<input type="checkbox"/> 3	Route calls to voice messaging, take message
<input type="checkbox"/> 4	Play announcement message
<input type="checkbox"/> 5	Restore routing to default site
<input type="checkbox"/> 6	Change current routing to different site
<input type="checkbox"/> 7	Route all calls to another number
<input type="checkbox"/> 8	Record announcements
<input type="checkbox"/> 9	Forwarding Menu
<input type="checkbox"/> 0	Help
<input type="checkbox"/> #	Done with call

- ☐ 4. To retrieve a message:

- ☐ 4a. Enter owner access.
☐ 4b. Press '1' to retrieve messages

Retrieve Message Menu	
<input type="checkbox"/> 3	Erase Message & play next
<input type="checkbox"/> 5	Keep Message & play next
<input type="checkbox"/> 7	Repeat message
<input type="checkbox"/> 8	Message Time Stamp
<input type="checkbox"/> 0	Help
<input type="checkbox"/> *	Main menu
<input type="checkbox"/> #	Done with call

- ☐ 4c. System plays first message and then prompts 'Erase or Keep message'
☐ 4d. User presses 3,5,7, or 8
☐ 4e. User plays rest of messages, or Hangs Up, or presses '*' for Main Menu.

- ☐ 5. To receive calls on mobile phone

- ☐ 5a. Enter owner access
☐ 5b. Press '2' to receive calls on mobile phone

- ☐ 6. To route calls to voice messaging

- ☐ 6a. Enter owner access
☐ 6b. Press '3' to route calls to voice messaging

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- ☐ 7. To play announcement message
 - 7a. Enter owner access
 - 7b. Press '4' to play announcement only
- ☐ 8. To restore routing to default site
 - ☐ 8a. Enter owner access
 - ☐ 8b. Press '5' to restore routing to default site
- ☐ 9. To change current routing to different site
 - ☐ 9a. Enter owner access
 - ☐ 9b. Press '6' to change current routing to different site
 - ☐ 9c. System prompts, "Enter Site Number"
 - ☐ 9d. User enters up to three-digit site number
 - ☐ 9e. System prompts "Calls routed to Site XX <site name>"
- ☐ 10. To route calls to a different number
 - ☐ 10a. Enter owner access
 - ☐ 10b. Press '7' to route all calls to a different number
 - ☐ 10c. System prompts, "Enter Phone Number"
 - ☐ 10d. User enters phone number
 - ☐ 10e. System prompts, "All calls routed to XXX-XXXX enter '9' for YES '7' for NO"
 - ☐ 10f. User enters '9' or '7'
 - ☐ 10g. If user enters '7' then go to step 10c

- ☐ 11. To record announcements
 - ☐ 11a. Enter owner access
 - ☐ 11b. Press '8' to enter record announcements menu

Record Announcements Menu

<div>1</div>	Record voice messaging greeting
<div>2</div>	Play voice messaging greeting
<div>3</div>	Erase voice messaging greeting
<div>4</div>	Record announcement greeting
<div>5</div>	Play announcement greeting
<div>6</div>	Erase announcement greeting
<div>0</div>	Help
<div>*</div>	Main Menu
<div>#</div>	Done with call

- ☐ 12. To change call forwarding
 - ☐ 12a. Enter owner access.
 - ☐ 12b. Press '9' to enter Forwarding Menu.

Forwarding Menu

<div>1</div>	Turn off 'No answer' forwarding
<div>2</div>	'No answer' forward to voice messaging
<div>3</div>	'No answer' forward to another number
<div>4</div>	Turn off 'Busy' forwarding
<div>5</div>	'Busy' forward to voice messaging
<div>6</div>	'Busy' forward to another number
<div>7</div>	Verify current forwarding
<div>0</div>	Help
<div>*</div>	Main Menu
<div>#</div>	Done with call

- ☐ 13. Press '1' to turn off 'No answer' forwarding
- ☐ 14. Press '2' to 'No answer' forward to voice messaging
- ☐ 15. Press '3' to 'No answer' forward to another number
 - ☐ 15a. System prompts, "Enter Phone Number"
 - ☐ 15b. User enters phone number

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- ☐ 15c. System prompts, "All 'No answer' calls forwarded to XXX-XXXX enter '9' for YES '7' for NO"
- ☐ 15d. User enters '9' or '7'
- ☐ 16. Press '4' to turn off 'Busy' forwarding
- ☐ 17. Press '5' to 'Busy' forward to voice messaging
- ☐ 18. Press '6' to 'Busy' forward to another number
 - ☐ 18a. System prompts, "Enter Phone Number"
 - ☐ 18b. User enters phone number
 - ☐ 18c. System prompts, "All 'Busy' calls forwarded to XXX-XXXX enter '9' for YES '7' for NO"
 - ☐ 18d. User enters '9' or '7'



Note:

When calls are forwarded to another number and the number is not another user on the system, a click is played every 15 seconds to the called party, up to the call limit timer. Then clicks are played like a Model 49/459 in the last 30 seconds in a call.

- ☐ 19. Press '7' to verify current routing. If calls are routed to mobile phone system prompts "Your calls are now routed to your mobile phone"
 - If calls are routed to voice messaging:
system prompts, "Your calls are now routed to voice messaging"
 - If calls are routed to announcement message:
system prompts, "Your calls are now routed to your announcement message"
 - If all calls are routed to another number:
system prompts, "Your calls are routed to XXX-XXXX"
 - If 'Busy' forwarding enabled system prompts:
"All Busy calls forwarded to voice messaging"
or
"All Busy calls forwarded to XXX-XXXX"
else
"Busy forwarding is disabled"

- If 'No answer' forwarding enabled system prompts:
"All 'NO' answer calls are forwarded to voice messaging"
or
"All 'NO' answer calls forwarded to XXX-XXXX"
else
"NO' answer forwarding is disabled"

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10. SYSTEM CONFIGURATION FILES

INTRODUCTION

The system configuration files contain information about the FASTNet system that is used by the microprocessor and its software to control the Model 2540. While these files (CONFIG.CDS, OPTIONS.CUS, OPARAM.CDS, and TRUNKS.CUS) are created at the factory to suit the individual system application, they are described in this section in the event that changes to the system configuration are required. To determine what aspects of the FASTNet switch operation these files control, read the entire section and examine a *copy* of your OPARAM.CDS, OPTIONS.CUS, or TRUNKS.CUS file using a text editor or the DOS Type command.



Caution:

FASTNet system configuration files, especially CONFIG.CDS or OPARAM.CDS, should only be accessed and/or modified by knowledgeable personnel. Switch operation can easily be crippled if something is done wrong. If changes are desired, please contact Zetron Application Engineers for assistance, Monday through Friday, 8 am to 5 pm PST/PDT. We are glad to offer any assistance necessary.

Always save a copy of the configuration files retrieved from the FASTNet Switch. Then you can restore your system to its prior condition if something stops working after changing any of the files.

Editing Files with TCE or a DOS Editor

The Trunk Card Editor program was created to simplify the system configuration files. The TCE allows the user to edit system files without having to learn multiple commands and their formats. Zetron strongly recommends that the TCE be used for *all* modifications possible. However, there are a few settings that are not currently available in the TCE. This section is provided as supplementary information on those settings.



Note:

System configuration files should never be modified using a word processor. Word processors may add control characters that cause problems with the FASTNet Switch operation.

Section 10. System Configuration Files

MODIFYING FASTNET SYSTEM FILES

To change system configuration files, use the following procedure (OPARAM.CDS is shown in this example):

- ☐ 1. Obtain the file from the switch by running the NETLINK program. Type the following at the “+” prompt:
`get oparam.cds`
- ☐ 2. Press <ESC> to exit NETLINK.
- ☐ 3. Use any DOS text editor to modify the file. Make sure the editor can modify and save plain ASCII files. If changes are made, please put a note (comment) in the history section at the top of the file describing what was done.

In all system configuration files, anything following a semicolon (“;”) is a comment.
- ☐ 4. Transfer the new file back to the switch through the NETLINK program. Type the following at the “+” prompt:
`put oparam.cds`
- ☐ 5. To make the switch operate with the new parameter file, issue the reboot command at the “+” prompt:
`reboot`

Type “Y” to confirm this operation when prompted.
- ☐ 6. Make a comment (using a semicolon) to notify Zetron of these changes, otherwise they may be overwritten during the next update.

CONFIG.CDS FILE

The ASCII text file named CONFIG.CDS loads the trunk cards. The system reads this file during startup. It tells the FASTNet Switch the software number and location for each trunk card.

This file is usually changed only when adding cards to the system, or if special or updated software is needed for the existing cards.

In the TCE program, the Trunk Cards Configuration (Edit, Cards) modifies the settings found in the CONFIG.CDS file.

File Format

The CONFIG.CDS file has one line for each trunk card. The card address (Card # field) is first, and must match the actual address which is set by switches SW1 (LSB) - SW4 on the upper front of the card and JP5 (MSB). Recommended card addressing is discussed in Section 4 of the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260).

The next item on each line is the ROM version of the card, which rarely changes for a given type of card. Finally, the software image file version (Image File field) for the card is listed. In addition, comments (Cmnt field) are usually present (i.e. anything after a semicolon).

Figure 10-1 shows a typical CONFIG.CDS file as viewed from an ASCII text editor. The data lines conform to the file format described in the previous paragraph, but are more readily deciphered and understood when viewed from the TCE program (Edit, Cards).

```

;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
;
; config.cds, generated by TCE.EXE V1.4 -- 01/06/95 08:30:24
;
; TESTNODE Z0000001
;
;-----
;
7 6 2TV26F2.img
8 6 2TV26F2.img
9 6 2TV26F2.img
12 6 2TVFN6F1.img
13 6 2TV26F2.img
14 6 2TV26F2.img
15 6 2TVFN6F1.img
16 6 2TV26F2.img

```

Figure 10-1. Typical CONFIG.CDS file

Section 10. System Configuration Files

OPARAM.CDS FILE

The ASCII text file named OPARAM.CDS provides a method for changing programmable parameters in the trunk cards. The file resides in the FASTNet Switch as a DOS file stored on the hard disk. When the FASTNet program starts up and initializes all of the trunk cards, it reads the script file named OPARAM.CDS and transfers the information to the cards. All of the programmable features have default values designed to work in most typical applications.

The script file is line-oriented; each line in the file contains one programmable feature. The file format (line-by-line) is as follows:

- the card address and unit number
- an argument count
- a parameter code
- the parameter itself

Each line is terminated by a carriage return. All numbers in the script file are entered as 2-digit, *hexadecimal* values. For example, the number 3 is entered as "03" and the number 31 is entered as "1F". Numbers are separated by one or more spaces or tabs.

In the TCE program, the Trunk Cards Configuration (Edit, Cards) modifies most of the settings found in the OPARAM.CDS file. In addition, the Node Configuration (Edit, Nodes) modifies two of the settings.

The data lines conform to the file format described on page 10-5, but are more readily deciphered and understood when viewed from the TCE program. This information is provided for advanced troubleshooting purposes only, to confirm file contents and integrity. The TCE program generates this file in the correct operating format from screens which are more informative and user-friendly.

Parameter File Format

Each OPARAM.CDS line generally looks like the following:

```
aa uu cc pp qq qq ... qq ; comment text
```

Where the parameters are defined as follows:

aa	peripheral card address/slot number (01-1E hex)
uu	peripheral card unit number (00 = trunk A, 01 = trunk B of dual trunks)
cc	parameter count (number of values “pp” and “qq” that follow)
pp	parameter code (described in following subsections)
qq	parameter values (described in following subsections) this may require a 16-bit number and is coded as two bytes
;	line characters following the “;” are comments

Trunk Card OPARAM Codes

The trunk card hex codes are current for software versions 6F1 (see Table 10-1) and are subject to change without notice.

**Notes on Table 10-1:**

1. The shaded rows indicate parameter settings that are not currently editable through the Trunk Card Editor.
2. Factory default settings are indicated by **.
3. The TCE field names are given for convenience in the Description column. Each of the fields reside in the Trunk Cards Configuration, unless noted otherwise.

Section 10. System Configuration Files

Table 10-1. Trunk Card OPARAM Codes

Parameter Code	Description / TCE Field	Parameter Count	Available Settings
00	No operation	01	None
01	Disconnect on Silence	02	00** = full voice time 01 = disconnect on silence see #13 - VOX disconnect threshold
09	Line Type Rings Before Answer Number of Feed Digits Line Direction Special notes: 1. Trunk cards configuration matrix plug insertion must match the programmed Line Type. If not, programmed arguments above are ignored by the trunk card and the default settings are used. 2. Command 09 should come <i>before</i> setting any timing values (parameters 05, 06, 07) in the OPARAM.CDS file.	05	byte 1 = line type, see Table 10-2 byte 2 = rings before answer (01 to 09 for end-end line type only) byte 3 = number of feed digits (00 to 09) (does not apply to outbound-only trunks) byte 4 = Initial line direction permitted 01 = inbound calling only 02 = outbound calling only 03 = two way trunk
05	TCON	03	nn = # msec that connect signal must be stable to recognize start of incoming call. See Table 10-2.
06	TANS	03	nn = # msec delay after supervision. See Table 10-2.
07	TDIS	03	nn = # milliseconds that disconnect signal must be present before dropping call for DID, loss of loop current. See Table 10-2.
08	(Use Feed Digits field= Y): Block Supervision 1st 3 digits of Low and High Numbers last 4 digits of Low Number last 4 digits of High Number	10	byte 1 = block number to program (00-09) byte 2 = block service code (for DID and E&M; see Table 10-2) byte 3 = not used bytes 4-7 = prefix/adder for block bytes 8-11 = low bound of valid digits bytes 12-15 = high bound of valid digits
0E	(Line Type Window) Dial Click Decode	02	00** = no dial click card 01 = dial click card present

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Table 10-1. Trunk Card OPARAM Codes (Continued)

Parameter Code	Description / TCE Field	Parameter Count	Available Settings
0F	Silence Duration (Node configuration)	03	nn nn = # milliseconds of silence that causes a disconnect
12	Debug mode	02	00** = off
13	Silence Level (applies to dual trunk only)	02	nn = relative threshold (default** = 64 = .09 VAC rms)
15	Dial Click Timing	03	<p>byte 1 = NOZONE - ignore click events this long after click. Default**: 12 ms (0C hex)</p> <p>byte 2 = OKZONE - wait this long after NOZONE for another click to occur. Default**: 94 ms (5E hex)</p> <p>Special notes:</p> <ol style="list-style-type: none"> 1. Programming a 0 for any dial click value leaves the setting on the dual trunk card unchanged. 2. If the dial click option card is not installed, an "opcode error" (01) will result. 3. Default dial click parameters provide 8 to 11 pps with 58% to 64% break.
16	(Line Type Window) Wink Start	03	nn nn = battery reversal pulse width (default** = 00, F0 = 240 msec)
19	Overdial Timeout (for dual trunk only)	03	nn nn = timeout between overdial digits (**default = 13 88 = 5000 msec)
1B	MF Decode Only	02	<p>00** = decode either pulse or DTMF feed digits</p> <p>01 = decode only MF digits</p>
1D	Decode "Reversed" Dial Pulses	02	<p>00** = decode the standard way (1 pulse is generated by dialing 1, 9 pulses by dialing 9)</p> <p>01 = decode reversed dials (1 pulse is generated by dialing 9, 9 pulses by dialing 1) (for international support)</p>
1F	DTMF Detect Time	03	<p>n1 n2; where:</p> <p>n1 = DTMF detect time in milliseconds</p> <p>n2 = 00 detect DTMF but do not pass through</p> <p>n2 = 01 pass DTMF through trunk</p>
20	Answer Supervision	02	<p>00 = supervise immediately</p> <p>01 = do not supervise until answer</p>

Section 10. System Configuration Files

Table 10-1. Trunk Card OPARAM Codes (Continued)

Parameter Code	Description / TCE Field	Parameter Count	Available Settings
21	Ring Back Slave	02	00 = Trunk Card starts ringback as soon as digits seen. 01 = No independent ringback, must be told to do so.
22	Minimum Overdial Digits of User ID (for E-E, DID Overdial Access)	02	nn = Minimum Number of Overdial Digits (Default** = 01)
23	Number of Feed Digits (DID trunks)	02	nn = Default is the same number of Feed digits specified in Oparam 09. (Oparam 09 must be programmed first)
24	Disable Owner's Access	02	00 = OFF; DTMF 0 is reported during playing of voice prompt. 01 = ON; DTMF 0 is not reported during playing of voice prompt.

Parameter Code 09 - Line Type

Parameter code 09 defines the telco line parameters for each trunk in the FASTNet Switch. The command specifies five bytes (09, byte 1, byte 2, byte 3, byte 4) as detailed in Table 10-1.



Note:

Command code 09 must precede command codes 05, 06, or 07 in the OPARAM.CDS file.

Example of command #09: For each *phone line*, the OPARAM.CDS file has a line like:

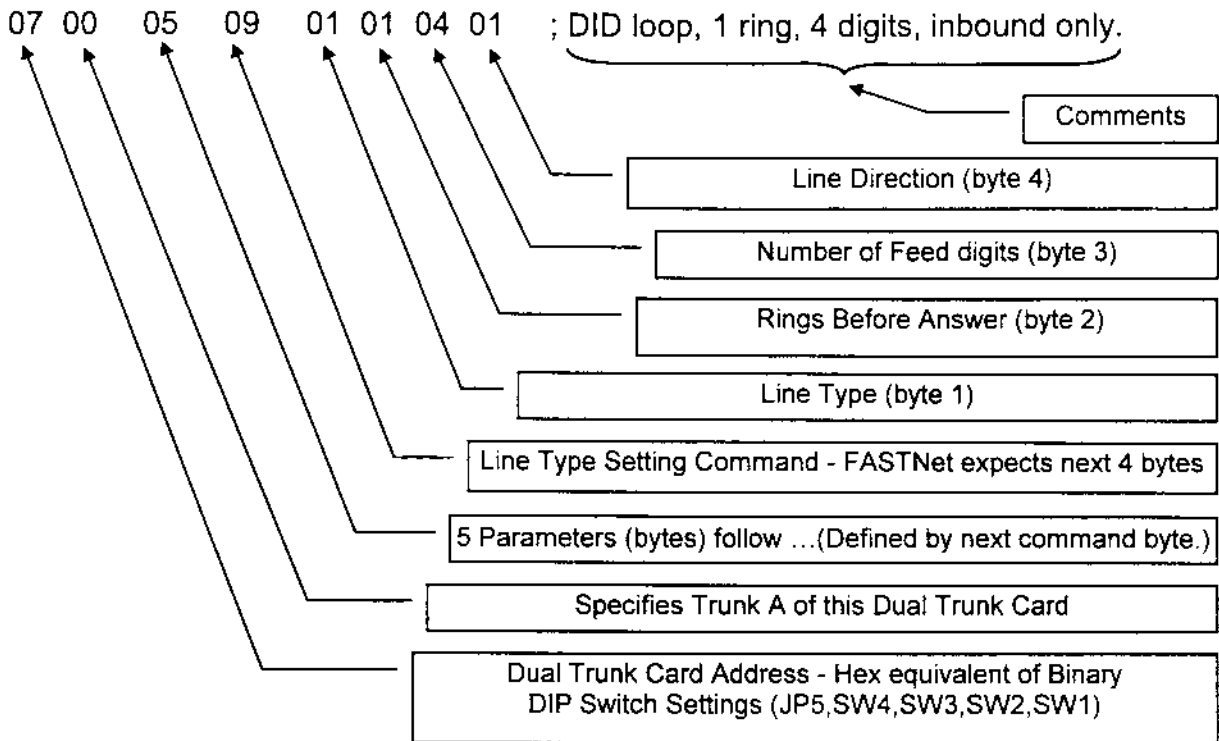


Figure 10-2. Example of Line Type Command (Code 09) in OPARAM.CDS

Parameter Codes 05, 06, 07 - Telco Timing Defaults

The default values for the supervision timing vary as noted in Table 10-2, depending on the type of telco interconnect trunk selected. To see exactly where these timing parameters occur in the supervision sequence for a particular interconnect, refer to Section 2 of the *Model 2540 FASTNet Switch Installation and Maintenance Manual* (Part No. 025-9260). Signal timing diagrams are provided for each standard interface type (end-to-end, E&M wink start, etc.) along with flow charts illustrating the FASTNet call processing.

Section 10. System Configuration Files

Table 10-2. Model 2540 Telco Timing Defaults

Line Type (Hex)	TCON (msec)	TANS (msec)	TDIS (msec)
00	0	0	0
01	60	120	360
02	70	120	360
08	0	1000	2500
09	1000	120	360
10	60	120	360
11	0	0	0
18	60	120	360

Parameter Code 08 - Block Feed Digit Settings

Each DID or E&M trunk has one to ten “blocks” of ID codes which are specified as valid in TCE. TCE subsequently generates parameter code 08, which defines valid DID feed digit blocks for DID and E&M trunks. These settings correspond to the fields in the Use Feed Digits window in TCE (Edit, Cards, Line Type).

Parameter code 08 specifies a hexadecimal parameter count of 10, which translates to 16₁₀ bytes of hex code to follow code 08 in the command line, in the following format:

aa uu 10 08 nn ss 00 [prefix/adder] [low boundary] [high boundary]

Where the parameters are defined as follows:

aa	trunk card address
uu	trunk card trunk (00 = A; 01 = B)
nn	Block Number (00 - 09)
ss	Service Code (00 - 03; See Table 10-3 below)

Table 10-3. Command Code 08, Block Service (Byte 2) Codes

Code	Action (Use Feed Digits = Y / Supervision field)
00	Do not supervise; ignore all incoming calls
01	Supervise but ignore
02	Supervise, answer with warning tone, hang-up
03**	Supervise, answer, and proceed with call

Example of command #08 in the OPARAM.CDS file:

Define E&M Type I Trunk 22B to accept three feed digits in two blocks:

820-6300 - 820-6499 enabled for normal call processing in block 00

8206000 ₁₀	= 7D36B0 ₁₆	⇒ 00 7D 36 B0	addres
300 ₁₀	= 12C ₁₆	⇒ 00 00 01 2C	low feed digit boundary
499 ₁₀	= 1F3 ₁₆	⇒ 00 00 01 F3	high feed digit boundary

555-1000 - 555-1199 enabled for normal call processing in block 01

5551000 ₁₀	= 54B398 ₁₆	⇒ 00 54 B3 98	addres
0 ₁₀	= 0 ₁₆	⇒ 00 00 00 00	low feed digit boundary
199 ₁₀	= C7 ₁₆	⇒ 00 00 00 C7	high feed digit boundary

For each *feed block* in this example, the file has a line like:

```
16 01 10 08 00 03 00 00 7D 36 B0 00 00 01 2C 00 00 01 F3
16 01 10 08 01 03 00 00 54 B3 98 00 00 00 00 00 00 00 C7
```

Trunk Card OPARAM Examples

Four-Wire Trunk Card Connected Through a Model 810 DID Inbound Only

```
; block 0, service code 3, addres 8206000, 300 through 399 all valid
01 00 10 08 00 03 00 00 7D 36 B0 00 00 01 2C 00 00 01 8F
01 00 05 09 19 00 03 01 ; E-M WINK, 0 ring, 3 digits, inbound
01 00 02 20 01 ; do not supervise until answer
01 00 03 1F 28 00 ; DTMF pass thru, 40Ms min detect time
01 00 02 21 01 ; ringback slave
```

Four-Wire Trunk Card Connected Through a Model 810 Outbound Only

```
04 00 10 08 00 03 00 00 00 00 00 00 00 00 00 00 03 E7
04 00 05 09 18 00 00 02 ; E-M IMM START, 0 ring, 0 digits, out
04 00 02 21 01 ; ringback slave
04 00 03 1F 28 00 ; DTMF pass thru, 40Ms min detect time
```

Section 10. System Configuration Files

Four-Wire Trunk Card Connected to a Model 49/459

; block 0, service code 3, adder 1000000, 000 through 0000 all valid
0B 00 10 08 00 03 00 00 0F 42 40 00 00 00 00 00 00 00 00
0B 00 05 09 19 01 00 03 ; E-M WINK START 1 ring, 0 digits, 2 way
0B 00 02 21 01 ; ringback slave
0B 00 03 1F 28 00 ; DTMF pass thru, 40Ms min detect time

Two wire Trunk Card POTS Line Outbound Only

09 00 05 09 08 00 00 02 ; E-E POTS, 0 ring, 0 digits, out
09 00 03 1F 28 00 ; DTMF pass thru, 40Ms min detect time

CUSTOM (.CUS) FILES

The various .CUS files contain one or more lines of command text. A command line consists of a keyword followed by one or more parameters, depending on the command. Commands and their parameters may be in upper or lower case. The following example commands are in upper case letters.

Blank lines are ignored, as is any text after a semi-colon (“;”). This allows the commenting and documentation of a file by visually splitting the text into blocks of related operations and annotating the various command settings.

Error Processing

Any errors encountered processing the custom files are logged. If the file is executed from NETLINK, an error records the function name, file name, and line number in the log file. A description of the error and the beginning of the line that caused the error are also noted.

When an error is encountered, only the bad parameter or the entire line may be bypassed. In any case, the entire file is processed, and the error does not change the associated function from its current condition. Error conditions and descriptions include:

<i>Argument needed</i>	The command needs more parameters than were found on the command line.
<i>Bad argument</i>	The value of a parameter was illegal. This includes using a word besides the valid keywords for that command, choosing a value that is out of range, or trying to select trunk cards that are not installed or functional.
<i>Command not known</i>	The first word found is not a valid command.
<i>Option not installed</i>	The command keyword controls an option that is not installed on this terminal.

Commands Within OPTIONS.CUS

All of the OPTIONS.CUS commands remain at default values until the command is read in the OPTIONS.CUS file. If a command occurs more than once in a file, the last instance of the command is used. Table 10-4 shows the OPTIONS.CUS file command set with the ‘no-entry’ defaults and the factory pre-set defaults (indicated by “*”).

In the TCE program, the Node Configuration (Edit, Nodes) modifies the settings found in the OPTIONS.CUS file. Each Field is found by following the path described in Table 10-4. (All entries are initiated from the Nodes selection in the Edit menu.) The shaded rows indicate fields that are not available from the TCE, or that have more options than TCE provides.

Section 10. System Configuration Files

Table 10-4. Summary of OPTIONS.CUS Parameter Defaults

COMMAND (TCE Field Path)	Default Value	Comments
CLIENTNAME (System Name)	ZETRON MODEL 2540 FASTNet Switch --	Notify mode reminder pages
DATEFORMAT (Date Format)	MONTH_DAY	Announce dates as 'Month' followed by 'Date' E.g. 'March 6th'
FORWARDINGBEEPS (Edit Advanced Features = Y / Enable Forwarding Beeps)	YES	Enables forwarding of beeps for mailbox messages
HAVEMESSAGES	ON	Enables voice recording to indicate mailbox messages
LOCALPORT (Edit Advanced Features = Y / Set Local Port = Y / Baud Rate)	4800	Serial Interface @ P2 in Model 2540 chassis
MAILSTART (Mailbox Playback Method)	OLDEST	Play oldest messages first
MAXOWNERS (Maximum User Mail Box Operations)	02	Determines the number of consecutive mailbox owner's access operations
MINIMUMDATA	0	Sets the minimum number of digits required for transfer to a paging terminal
MINIMUMPROMPT (Edit Advanced Features = Y / Minimum Prompt Duration)	2*	Voice <i>prompts</i> must be at least - 2 seconds
MINIMUMSMR (Log SMDR Records = Y / Time Duration)	0	Minimum SMDR logging - 0 seconds
MINIMUMVOICE (Edit Advanced Features = Y / Minimum Voice Threshold)	3*	Voice <i>messages</i> must be at least - 3 seconds
MMBAUD (Edit Advanced Features = Y / Edit Mastercard Modem = Y / Mastercard Modem Port Baud)	2400	Sets the mastercard modem baud rate.
MODEMINIT (Edit Advanced Features = Y / Set Modem Port = Y / Custom FASTNet Modem String = Y / Enter Modem String)	AT S0=2 S7=30 S9=06 S10=04	May be subject to change, per modem

* These are not the "default if missing" values, but the values we currently use as defaults for FASTNet Switches.

Section 10. System Configuration Files

Table 10-4. Summary of OPTIONS.CUS Parameter Defaults, Continued

COMMAND (TCE Field Path)	Default Value	Comments
MODEMPORT (Edit Advanced Features = Y / Set Modem Port = Y / Baud Rate)	2400	Connect to modem at 2400 baud
NETDISPATCHTASKS (Edit Advanced Features = Y / Network Dispatch Tasks)	3	Sets the maximum number of simultaneous network dispatch calls
NODE (System Number)	1	FASTNet Node number 1
PAGETASKS (Edit Advanced Features = Y / Custom Page Tasks Minimum & Maximum)	MIN 3 MAX 80	Do Not Change, unless directed to do so from Zetron Tech Support ...
#ENABLE (Pound (#) Enable)	ON	Affects Voice Messaging only
PRINTERPOST (Edit Advanced Features = Y / Use Logging Printer)	OFF	Only available with printer port option
PRINTONLY (Edit Advanced Features = Y / Use Logging Printer = Y / Printer Messages)	-a (all)	Log certain types of messages to the "log printer".
RETRIEVALSTART (Retrieval Playback Method)	NEWEST	Determines order in which mailbox messages are retrieved.
SILENCEDURATION (Edit Advanced Features = Y / Set ADPCM Card Parameters / Silence Duration)	6*	Pause Compression = OFF
SILENCELEVEL (Edit Advanced Features = Y / Set ADPCM Card Parameters / Silence Level)	240*	Pause Compression = OFF
SMDR (Log SMDR Records)	ON	SMDR call logging - ON
SMDRROAM (Log SMDR Roaming Records)	OFF	SMDR roaming call logging
SPEAKTIME (Mail Box Time Stamp Playback)	MANUAL	User must press 8 for time stamp

* These are not the "default if missing" values, but the values we currently use as defaults for FASTNet Switches.

Section 10. System Configuration Files

Table 10-4. Summary of OPTIONS.CUS Parameter Defaults, Continued

COMMAND (TCE Field Path)	Default Value	Comments
SYSLOGS (Edit Advanced Features = Y / Log File Size & Number of Log Files)	SIZE 20000 NUMBER 20	SIZE x NUMBER ≤ 2,000,000
TIMEFORMAT (Time Format)	12HOUR	Announce time in 12 hour time format with 'a.m.' and 'p.m.' designations E.g. '11:24 a.m.'
TOTALPCM (Edit Advanced Features = Y / Total PCM Paths)	48	48 PCM slots for 20/40 trunk switches 64 PCM slots for 60 trunk switches. Trunk Card JP1 setting is crucial ...
TRAFFIC (Edit Advanced Features = Y / Traffic Filter Type)	-a (all)	Log certain types of messages to SYSLOGS file for "Monitor" function

* These are not the "default if missing" values, but the values we currently use as defaults for FASTNet Switches.

HAVEMESSAGES

The HAVEMESSAGES command determines whether the FASTNet Switch sends a recorded message to mobiles that have unretrieved messages in their voice mailbox.

The available settings are ON and OFF. The default setting is ON.

MINIMUMDATA

The MINIMUMDATA command sets the minimum number of over dial digits required to initiate a transfer to a paging terminal. The user type must be set to P - Paging and only numeric digits can be sent (no alphanumeric pages). In addition, this setting does not determine how the receiving paging terminal processes the page. For instance, if the MINIMUMDATA is set to 3 and the paging terminal only accepts pages of minimum 5 characters, the page will not be sent.

It is recommended that this field not be set greater than 2 (unless the dial-up connection to the paging terminal is a long-distance call). This allows the receiving paging terminal to do the appropriate filtering.

Enter a minimum number between 1 and 15. An entry of 0 turns off the MINIMUMDATA feature. The default setting is 0 = off.

PRINTONLY

The PRINTONLY command is available when the Logging Printer Port option (950-9118) is installed on the CPU Card. When the PRINTERPOST command is enabled, the system operator can customize the type of events that trigger log posting to the printer.

Although the TCE does provide a setting that corresponds to this command (Edit, Nodes, Edit Advanced Features = Y, Use Logging Printer = Y, **Printer Messages**), it does not include as many options as the PRINTONLY file command.

The OPTIONS.CUS "Printonly" and Fastbase/TCE "Monitor" commands both allow the selection of log posting display type. For either command there should be a parameter, which is of the same form as the Netlink "traffic" command options, as listed below:

- | | |
|---------------------------------------|---|
| -a | Include ALL postings into the log. |
| -e | Include only ERROR postings into the log. |
| -I
(not available
from the TCE) | <p>Include <i>specified</i> postings into the log. Postings are specified by the <i>first</i> character of the log display line only.</p> <p>[blank] Posting a <i>successful</i> ticket.</p> <ul style="list-style-type: none"> . Posting a <i>failed ticket</i>, such as a call to an invalid Node User ID, etc. Typically are operational (caller) errors within design parameters. + <i>Comment</i> Line or <i>Informational</i> Line posted by FASTNet. Used to relate interconnect call status messages, day rollover, etc. - <i>Warning</i> or undesirable conditions. Calls may be dropped, but the conditions should be self-correcting. Examples: failure to obtain Dial Tone on a trunk (before timeout), printer port 'overflow', etc. ? <i>General Error</i>. 'Invalid destination' errors resulting from dead or missing trunk card(s), Fastbase programming errors, TCE configuration errors, etc. Generally FASTNet System problems. ! <i>Serious Error</i>. Unrecoverable software errors or possible hardware failure. Probably time to call Zetron for assistance. Please note the exact text of the error as viewed on the computer monitor. |

Examples:

```
PRINTONLY -I!? ; Printer logs only failure messages
TRAFFIC -I.? ; SYSLOGS files log caller and
FASTNet problems
```

Section 10. System Configuration Files

- | | |
|----|--|
| -f | FLUSH current traffic lines.
<i>(not available from the TCE)</i> |
| -r | RESTORE current traffic lines.
<i>(not available from the TCE)</i> |
| -x | EXCLUDE <i>specified</i> postings from the log.
<i>(not available from the TCE)</i> |

Commands within TRUNKS.CUS

This file is normally created by Fastbase.

The TRUNKS.CUS configuration file is used to set or select various options for trunks. These trunk options only affect Central Software. These options control trunk interface operations via the FASTNET.EXE program. OPARAM.CDS parameters are utilized within the trunk cards directly, whereas TRUNKS.CUS parameters control the manner in which FASTNET.EXE *communicates* with the trunk cards.

In the TCE program, the Trunk Groups Configuration (Edit, Trunk Groups) modifies most the settings found in the TRUNKS.CUS file. In addition, the Node and Cards Configurations are used to modify some of the parameters.

After each option is set to a value, that state remains in effect for each subsequent trunk, until it is changed with an alternate command. Table 10-5 shows the TRUNKS.CUS file command set with the factory pre-set defaults (indicated by “*”).



Notes on Table 10-5:

1. The TCE fields are noted within parenthesis () in the Command column. Each command is set via Edit, Trunk Groups in TCE, unless noted otherwise.
2. The shaded row indicates a command that cannot be configured in the TCE.

Table 10-5. Summary of TRUNKS.CUS Parameter Defaults

Command / (TCE Field)	Default Value	Comments
GROUP (Trunk Group)	0 *	Trunk Group setting. Relates trunk cards to repeater sites. Range 1-99; 0 = Ungrouped
HUNT (Hunt Method)	LOWEST	Determines the method in which the next available trunk is chosen. Scan up from the (LOWEST) addressed trunk in the group.
SECURITY (Security)	YES	Security code required to access this trunk?
SHAREDMODEMPORT (Nodes, Edit Advanced Features = Y / Set Modem Port = Y / Use Shared Modem)	(blank) *	Designates that the specified trunk number is shared with the FASTNet maintenance modem
SUPERGROUP	(blank) *	Allows the creation of a group of groups.
TRUNK (Corresponds indirectly to Cards, Trunk Group)**	Customized per Sales Agreement *	Used after setting one or more values with the GROUP and WINKLIMIT commands. Selects a trunk(s) to apply the current values to. <i>**In the TCE, the trunks (cards) point to the trunk groups, instead of the trunk group pointing to the trunks. Configure a trunk and then configure a group that it resides within.</i>
WINKLIMIT (Wink Limit)	20	Sets the time (in 100-ms increments) that the trunk will wait for a wink from the device it is signaling

* These are not "default if missing" values, but are factory pre-set values for FASTNet Switches.

"Trunk Groups" are needed in a FASTNet Switch to define multiple FASTNet interconnects (trunks) which share like characteristics. Groups identify which trunk cards are connected to the repeaters at a given radio site, or connected to DID telco lines, or connected to end-to-end lines, etc.. These trunk groups are also utilized by the least cost routing for all outgoing calls. The trunk statistics feature collects and displays information on a per trunk group basis.

SuperGroup

The SUPERGROUP command is used to specify a collection of groups, i.e. a "group of groups". Unlike other TRUNKS.CUS commands, SUPERGROUP *does not* affect all following selected trunks nor groups. This command only affects parameters specified within the command line, and thus can be put anywhere in the file. There can be *no more than five (5)* SuperGroups in any one FASTNet Switch.

Section 10. System Configuration Files

The supergroup number can be between 01 and 99. The default setting is none.

This function is useful for allowing some Node Users access to any trunk within two different trunk groups. The unrestricted Node Users could utilize the SUPERGROUP, which contains all of the subset groups. Other Node Users may be authorized to use only some of those trunks, perhaps due to hardware restrictions of their respective mobiles, etc.

The TRUNKS.CUS file may be more intuitively readable if SUPERGROUP command lines are located at the end of the file.

The format of the command is:

```
SUPERGROUP X Y1 Y2 Y3 ... Y99      ; X = supergroup number (01 - 99)
                                     ; Y1 to Y99 are normal Trunk Group
                                     ; numbers 1 to 99, set with the GROUP
                                     ; command. Only Y1 need be present,
                                     ; though the command doesn't make
                                     ; sense without at least two groups listed.
```

Sample TRUNKS.CUS File Listing

A typical TRUNKS.CUS file may look like this one:

```
GROUP 00                                ;Following trunks are "ungrouped"
TRUNK 05A 05B 06A 06B 07A
GROUP 10                                ; Outbound-Only trunks
TRUNK 0800 0801 0900 0901
GROUP 20                                ; "Trunk Group 20" trunks
TRUNK 01A
TRUNK 02A
TRUNK 03A
TRUNK 04A
GROUP 30                                ; "Trunk Group 30" trunks
TRUNK 01B
TRUNK 02B
TRUNK 03B
TRUNK 04B
SHAREDMODEMPORT 8A                      ; share trunk 8A with Maintenance Modem
```

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11. EXAMPLE DATABASES

INTRODUCTION

Sometimes it is helpful to look at how other systems are configured. Three examples are presented in this section. The first example is a live system located in North America, although the names have been changed to protect the innocent. The second example focuses on outdialing programming, and the third example deals with scripts.

The pertinent Fastbase and Ebase (Multibase/TCBase) screens are shown for each node and radio site configuration. The examples are described in the same order as explained in Section 4 for easy reference. Most of the fields are not described here. This section only highlights the fields and subfields that require specialized settings - i.e., the tricky stuff.

EXAMPLE #1 - LIVE SYSTEM

The FASTNet Node has two Model 49 sites directly connected to it. One of these Model 49 sites is named Pottsville; the other is named Elk Mountain. The FASTNet Switch is directly connected to both Model 49 sites by 4-wire circuits. The Model 2540 is located in the same building as the Pottsville site, so that connection is just a 4-wire telephone cable. The connection to Elk Mountain is a 4-wire microwave link.

Trunk Groups Configuration (TCE)

The FASTNet Switch's trunk configuration should be defined first. This FASTNet Switch has six trunk groups numbered thirty-one to thirty-six, as listed in Table 11-1.

Table 11-1. Sample Database Trunk Groups

Trunk Group	No. of Trunks	Type of Service
31	2	Long Distance 2 wire measured service
32	2	FX trunks to a nearby CO (Bear Creek)
33	6	Local CO POTS trunks
34	6	2 way MF DID trunks
35	3	Pottsville M49 Units (Site 1)
36	3	Elk Mountain M49 Units (Site 2)

For this application, we want to use the MF DID trunks mainly for incoming calls. That means outgoing calls are routed to other trunk groups first, and only use the MF trunks when all others are busy. One of the TCE trunk group configurations (31) is shown in Figure 11-1.

Section 11. Example Databases

FASTNet Trunk Card Config. Editor V1.6 (c)1993-96 Zetron (SUPERVISOR mode)

INDEX	
TG	COMMENT
04	
05	
06	
31	LONG DISTANCE 2-WIR
32	FX TRUNKS TO CO
33	LOCAL CO POTS TRUNK
34	2-WAY MF DID TRUNKS
35	POTTSVILL M49S
36	ELK MOUNTAIN M49S

NODE 008954	
TRUNK GROUP CONFIGURATION	
Trunk Group: [31]	
Comment: [LONG DISTANCE 2-WIR]	
Voice Prompts: B	
Security: Y	
Wink Limit: 04	
Hunt Method: LOWEST ...	
Create Date: 09/04/96	
Alter Date:	

HELP	
Edit: press ENTER/RETURN/<--+	
Guide Window: F1	
Done: Esc	

Figure 11-1. TCE Trunk Groups Configuration

Node Configuration

The Node created for this Switch is Node 001, as shown in Figure 11-2.

NODE_CONFIG	
Node Number: [001]	
Node Name:[POTTSVILLE FASTNET]	
Node Access:L ... PC Comm Port:1	
Direct Connect To Other Nodes: N ...	
Dial Connect To Other Nodes: N ...	
Batch Interval (sites): 0010 minutes	
Batch Interval (nodes): 0003 minutes	
Pop-Up System Voice Prompt Window:Y..	
Create Date: 08/01/96	
Alter Date:	

Figure 11-2. Fastbase Node Configuration

Outdial Program

The following outdial programs are defined for dialing either DTMF or MF, and either inserting or stripping off a one (1) at the beginning of the dialed digits. The outdial programs tell the FASTNet Switch how to pump the digits out to the trunk, once a free trunk has been seized for an outgoing call.

Outdial Program Examples

The examples below, Figure 11-3 through Figure 11-8, show the outdial programs configured in Fastbase for each type of call.

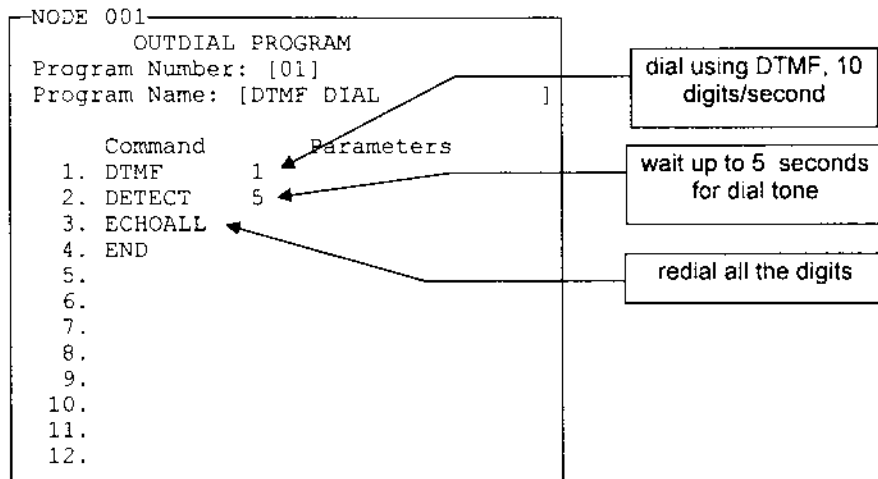


Figure 11-3. Outdial Program #1

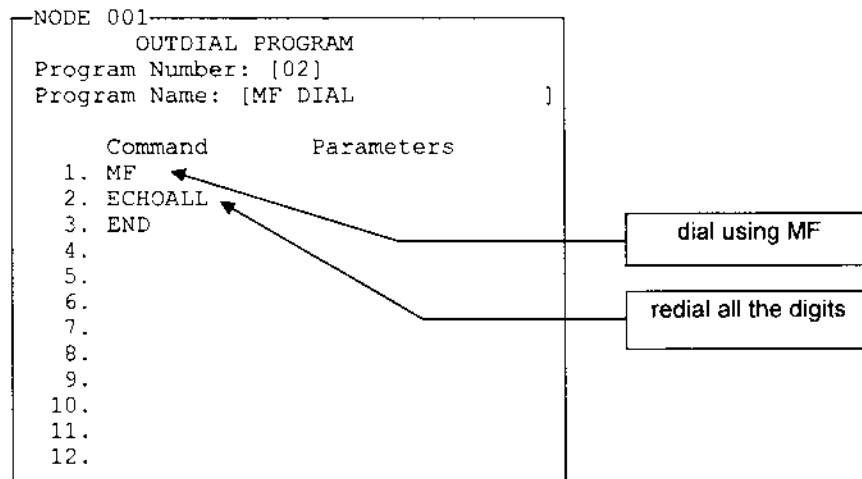


Figure 11-4. Outdial Program #2

Section 11. Example Databases

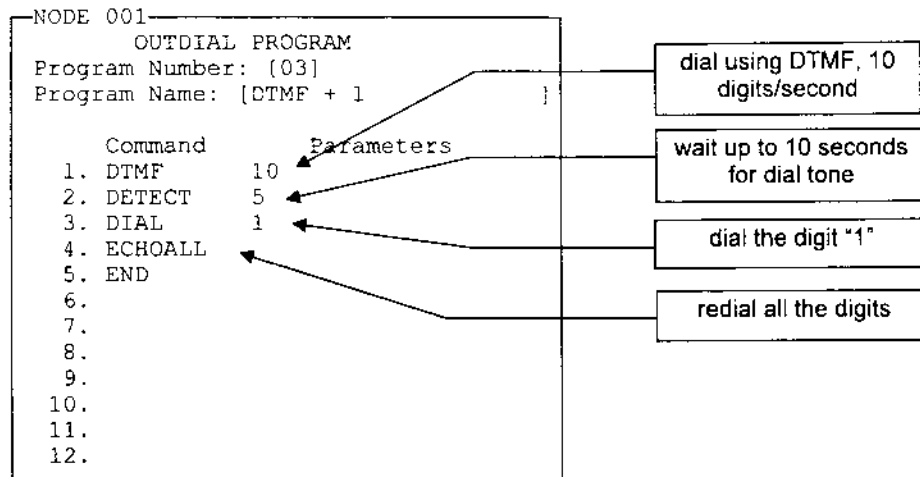


Figure 11-5. Outdial Program #3

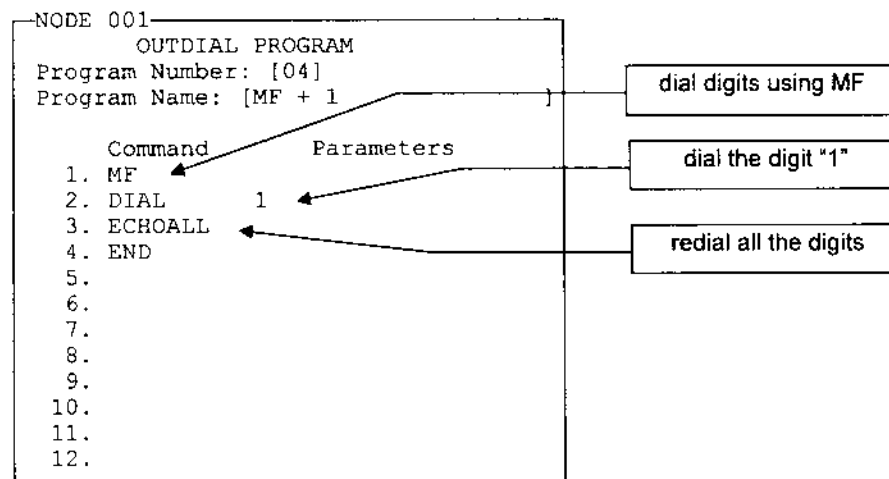


Figure 11-6. Outdial Program #4

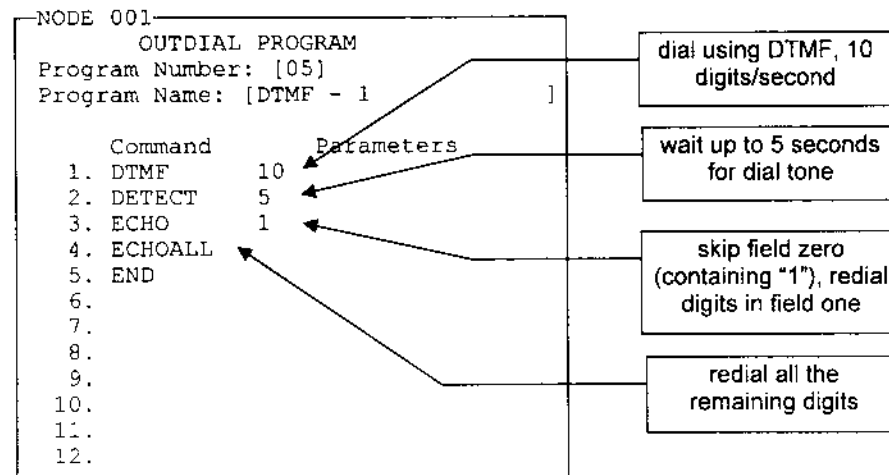


Figure 11-7. Outdial Program #5

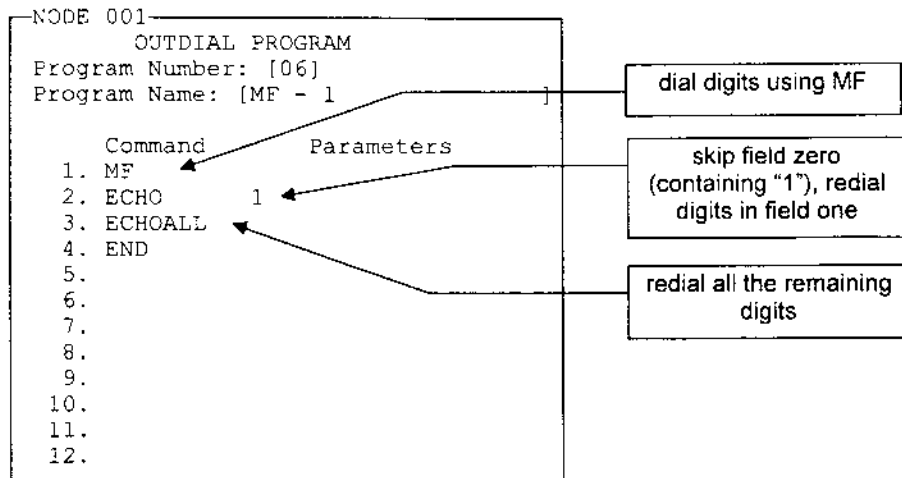


Figure 11-8. Outdial Program #6

Least Cost Routing

Least Cost Routing means directing calls to the most cost-effective trunk group, based on the dialed digits. The routes define the least expensive trunk group first, followed by the next desirable, and so on. The Switch only moves to the next trunk group when all the trunks are busy in the previous group.

Least Cost Route Tables

The examples below, Figure 11-9 through Figure 11-14, show the least cost routing tables programmed in Fastbase for each type of call.

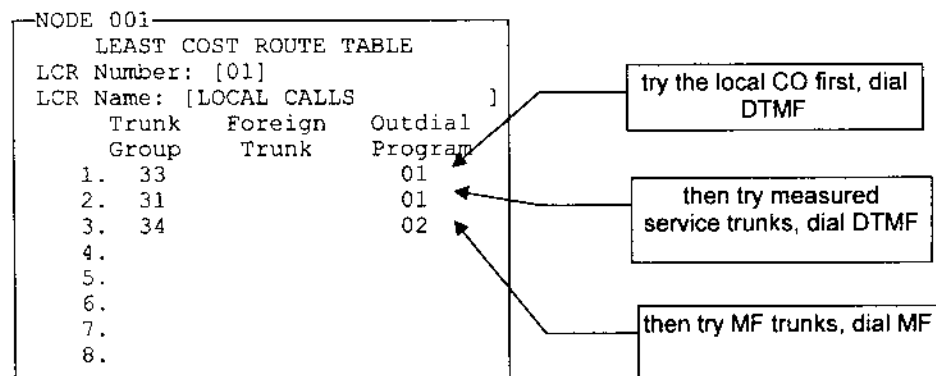


Figure 11-9. Least Cost Route #1

Section 11. Example Databases

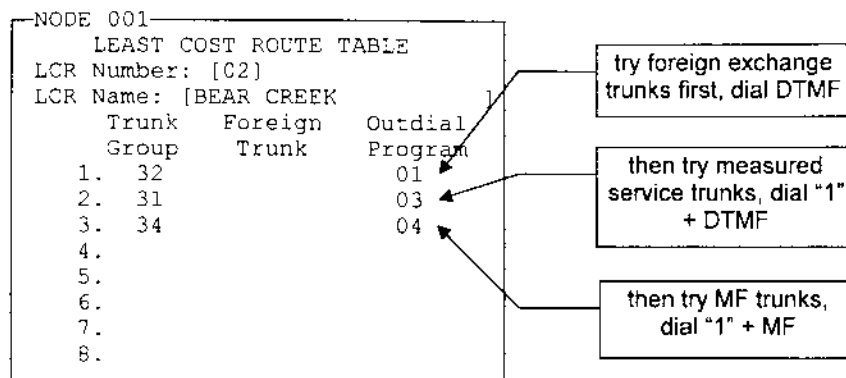


Figure 11-10. Least Cost Route #2

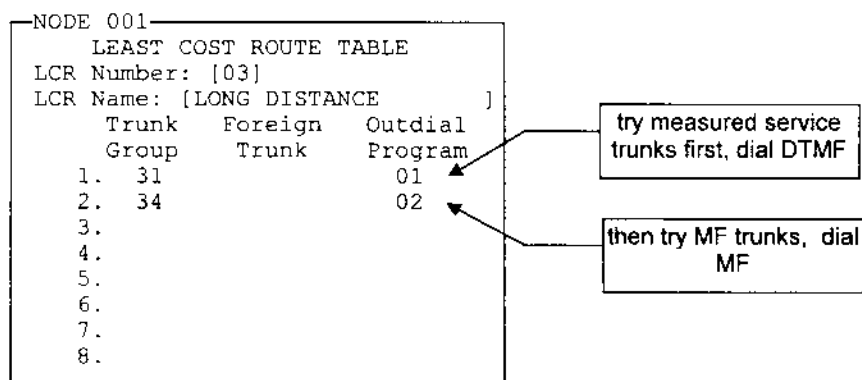


Figure 11-11. Least Cost Route #3

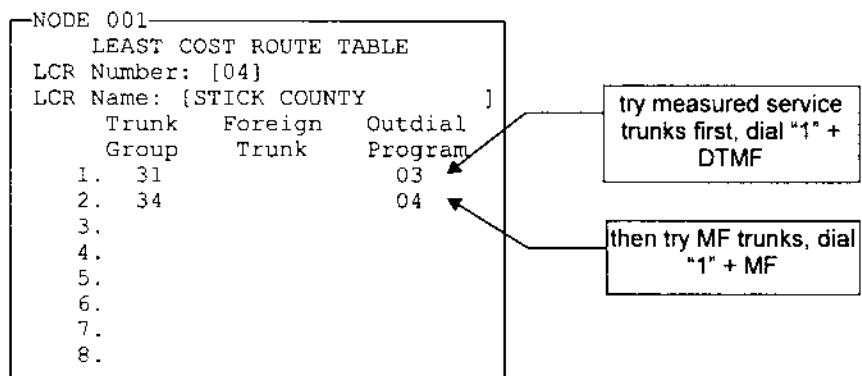


Figure 11-12. Least Cost Route #4

NODE 001

LEAST COST ROUTE TABLE			
LCR Number: [05]			
LCR Name: [0 CALLS]			
	Trunk Group	Foreign Trunk	Outdial Program
1.	33		01
2.			
3.			
4.			
5.			
6.			
7.			
8.			

"0" + digits always goes to the local CO, dial DTMF

Figure 11-13. Least Cost Route #5

NODE 001

LEAST COST ROUTE TABLE			
LCR Number: [06]			
LCR Name: [BEAR CREEK +1]			
	Trunk Group	Foreign Trunk	Outdial Program
1.	32		05
2.	31		01
3.	34		02
4.			
5.			
6.			
7.			
8.			

try FX trunks first, strip off "1" + dial DTMF

then try measured service trunks, dial DTMF

then try MF trunks, dial MF

Figure 11-14. Least Cost Route #6

Dialing Plans

In most cases, one dialing plan table is sufficient for all possible digit patterns. The dialing plan matches each digit pattern with a Least Cost Route. If a digit pattern can not be matched in the dialing plan, the FASTNet Switch disconnects the call.

The example shown in Figure 11-15 has the digit plans programmed in Fastbase for each type of call.

Section 11. Example Databases

NODE 001			Bear Creek CO, "1" + DTMF
DIALING PLAN			Bear Creek CO
Plan Number: [01]			Stick County prefixes
Plan Name: [GENERAL DIAL PLAN]			Information
	Digit Plan	Route Number	911 emergency (local)
1.	1 363 XXXX	06	Toll free "800" (local)
2.	363 XXXX	02	Long distance
3.	362 XXXX	04	Local long distance
4.	385 XXXX	04	Operator long distance
5.	628 XXXX	04	Operator local long distance
6.	1 411	01	Local calls
7.	911	01	Operator calls, only local
8.	1 800 XXX XXXX	01	Local calls
9.	1 NAX XXX XXXX	03	
10.	1 NNX XXXX	03	
11.	0 NAN XXX XXXX	01	
12.	0 NXX XXXX	01	
13.	NNX XXXX	01	
14.	0	05	
15.	01Z	03	
16.			
Next Page: Y ... 00 On Next Page			

Figure 11-15. Example Dialing Plan



Notes on Digit Plans:

Plans 3-5 are long distance calls to the FASTNet's local CO, but are considered local calls to the mobile users.

Plans 11 and 12 route all operator-assisted long distance calls as though they are local. The FASTNet Switch operator incurs no toll charges.

Plan 15 routes international calls like long distance calls. International dialing can be restricted.

Radio Sites

Radio Sites in this example are Model 49 LTR™ repeater sites. There are two sites in this case: Pottsville and Elk Mountain. Since the FASTNet Switch is in the same physical location as Pottsville, the Pottsville site is site one (001). The Elk Mountain site is site two (002).

Table 11-2 shows the output from the Fastbase Printnet / radio Sites menu item. Both of these sites are directly connected to the Model 2540 via E&M 4-wire trunks, even though site 2 (Elk Mountain) is E&M 4-wire connected via microwave link. It makes life less confusing to configure the Trunk Groups as having the same *Trunk Group* number as the *Radio Site* number they are connected to. Although the Radio Sites printout does not list all parameters, the Trunk Groups and site phone number (only used for dial-up "connect type") must be correct for proper FASTNet operation.

Table 11-2. Radio Site Information

Site #	Site Name	Connect Type	External Site ?	Device Type	Create Date	Alter Date
001	POTTSVILLE	Direct	N	M49N	04/28/95	04/29/95
002	ELK MOUNTAIN	Direct	N	M49N	04/28/95	04/29/95

Model 49 Site Configuration (Ebase or Multibase)

The Model 49 site configuration that correspond to these two sites are shown next. These are configured via Multibase or Ebase / Edit49 ... Notice the names and site numbers correspond to those assigned in Fastbase / editNet. The name should always be the same for sanity's sake, but the site numbers do not have to be the same. Figure 11-16 shows the (Ebase) Edit49 / Site config / Interconnect and FASTNet windows for the Pottsville site (0001). This window pops up when a Y is entered in the FASTNet Switch in Use field at the bottom of the Interconnect window.

```

SITE_CONFIG
Site Number: [0001]
Site Name:[POTTSVILLE      ]

INTERCONNECT
DTMF Timeouts --
Interdigit:5.0 First Digit:5.0
Regenerated Digits -- Min:07 Max:11
Require Dialtone:N
BusyUp for Programming:N

Mobile Turn-Around Time:30
Overdial Access #:N

FASTNET
FASTNet Phone Number:
Reporting Repeater: 09

Roaming Batch Interval: 05
Message Beep Interval: 05

Store SMDR Recs to FASTNet Calls: Y
  
```

Not used for "Direct" connected Model 49 units - only used for "dial" connect type interfaces.

The reporting repeater is the unit that is designated to communicate operational information to the Model 2540.

Figure 11-16. Ebase Site Configuration - Pottsville

The FASTNet Phone Number field is blank because the Model 49 site is directly connected to the FASTNet Switch. The Reporting Repeater designates which Model 49 at this site is going to queue up messages to report back to the FASTNet Switch. This repeater **MUST** be a Model 49 and forwards the accumulated messages to the FASTNet Switch according to the Roaming Batch Interval (5 minutes).

Next, the Model 49 Site Config window is shown in Figure 11-17, for the Elk Mountain site of our example database. This is accessed in Ebase via Edit49 / Site config / Interconnect (Y)/ FASTNet Switch in Use (Y).

Section 11. Example Databases

```
SITE_CONFIG
Site Number: {0002}
Site Name: {ELK MOUNTAIN }

INTERCONNECT
DTMF Timeouts --
Interdigit:5.0 First Digit:5.0
Regenerated Digits -- Min:07 Max:11
Require Dialtone:N
BusyUp for Programming:N

Mobile Turn-Around Time:30
Overdial Access #:N

FASTNET
FASTNet Phone Number:
Reporting Repeater: 05

Roaming Batch Interval: 05

Message Beep Interval: 05

Store SMDR Recs to FASTNet Calls: Y
```

Not used for "Direct" connected Model 49 units - only used for "dial" connect type interfaces.

The reporting repeater is the unit that is designated to communicate operational information to the Model 2540.

Figure 11-17. Ebase Site Configuration - Elk Mountain

All the same comments from the Pottsville Site Config window also apply to this one. Note that the Reporting Repeater is different. It doesn't matter which repeater is designated, as long as one is designated and it is a Model 49.

Roaming Class of Service

The Roaming COS (Class of Service) defines which site(s) a user can roam to and place/receive calls. Every mobile user must have a Roaming COS, because this is how overdial digits get programmed for the site(s) where a mobile has access. If the Roaming COS only has one site defined, then the user effectively cannot roam between sites. In this example, there are only two possible sites to roam between; hence, it is necessary to define two Roaming COSs with only one site in each of them (#001 and #002), plus one Roaming COS with both sites defined (#003). Figure 11-18 through Figure 11-20 show the three roam classes programmed in Fastbase under the editNet / Roam cos table selection.

Section 11. Example Databases

```

NODE 001-----
      ROAMING SITES ENABLED
Roam COS Number: [001]
Roam COS Name: [POTTSVILLE (ONLY) ]

      Site#      Site#      Site#      Site#
1. 001      2.      3.      4.
5.      6.      7.      8.
9.      10.      11.      12.
13.      14.      15.      16.
17.      18.      19.      20.
21.      22.      23.      24.
25.      26.      27.      28.
29.      30.      31.      32.
33.      34.      35.      36.
37.      38.      39.      40.
41.      42.      43.      44.
45.      46.      47.      48.

Next Page? N ...      00 On Next Page

```

Figure 11-18. Roaming COS #1

```

NODE 001-----
      ROAMING SITES ENABLED
Roam COS Number: [002]
Roam COS Name: [ELK MOUNTAIN (ONLY) ]

      Site#      Site#      Site#      Site#
1. 002      2.      3.      4.
5.      6.      7.      8.
9.      10.      11.      12.
13.      14.      15.      16.
17.      18.      19.      20.
21.      22.      23.      24.
25.      26.      27.      28.
29.      30.      31.      32.
33.      34.      35.      36.
37.      38.      39.      40.
41.      42.      43.      44.
45.      46.      47.      48.

Next Page? N ...      00 On Next Page

```

Figure 11-19. Roaming COS #2

Section 11. Example Databases

```
NODE 001
ROAMING SITES ENABLED
Roam COS Number: [003]
Roam COS Name: [ELK MT. & POTTSTVILLE]

  Site#      Site#      Site#      Site#
1. 001      2. 002      3.          4.
5.          6.          7.          8.
9.          10.         11.         12.
13.         14.         15.         16.
17.         18.         19.         20.
21.         22.         23.         24.
25.         26.         27.         28.
29.         30.         31.         32.
33.         34.         35.         36.
37.         38.         39.         40.
41.         42.         43.         44.
45.         46.         47.         48.

Next Page? N ...    00 On Next Page
```

Figure 11-20. Roaming COS #3

Toll Class of Service

The Toll COS (Class of Service) specifically identifies dialed digit sequences that can either be restricted or allowed for FASTNet Node Users (having this COS). For Node 1, the Toll COS tables may look like those shown in Figure 11-21 and Figure 11-22.

```
NODE 001
TOLL RESTRICT/ALLOW CLASS OF SERVICE
Toll COS Number: [001]
Toll COS Name: [NO TOLL, NO INT'L ]
  Digit Plan    Allow/Restrict
1. 1 900 XXX XXXX    R
2. 012              R
3. 1 976 XXXX        R
4. 1 555 1212        R
5. 1 NAX 555 1212    R
6.                  R
7.                  R
8.                  R
9.                  R
10.                 R
11.                 R
12.                 R
13.                 R
14.                 R
15.                 R
16.                 R

Next Page: N ...    00 On Next Page
```

Figure 11-21. Toll COS Table #1

NODE 001		
TOLL RESTRICT/ALLOW CLASS OF SERVICE		
Toll COS Number: [002]		
Toll COS Name: [NO TOLL]		
	Digit Plan	Allow/Restrict
1.	1 900 XXX XXXX	R
2.	1 976 XXXX	R
3.	1 555 1212	R
4.	1 NAX 555 1212	R
5.		R
6.		R
7.		R
8.		R
9.		R
10.		R
11.		R
12.		R
13.		R
14.		R
15.		R
16.		R
Next Page: N ... 00 On Next Page		

Figure 11-22. Toll COS Table #2

General Class of Service

The General COS (Class of Service) allows many features to be enabled or disabled for whole groups of users or individual users. The options provided are selected by specifying the applicable General COS number in the Node User's database. In the example database, four distinct General COS specifications are highlighted. These are shown in Figure 11-23 through Figure 11-26. Each new class in the sequence has all the features of the previous COS, plus some upgraded capabilities.

General COS #1 - Basic Users

The first General COS (001), shown in Figure 11-23, is a very basic service. Most everything is disabled except Mobile to Mobile phone calls through the Model 2540. Also, the Ring Out Time is set to 35 in each of these General COSs. Please look back at the Mobile Answer Time field in the Edit 49 / Site config / Interconnect (Y) menu for both Pottsville and Elk Mountain. The Mobile Answer Time is 30 seconds. It is important that the Ring Out Time on the FASTNet Switch is *greater than* this Mobile Answer Time (for *every* COS defined).

Section 11. Example Databases

```

NODE 001-
  GENERAL CLASS OF SERVICE
  COS Number: {001}
  COS Name: [BASIC SERVICE      ]
  Dialing Plan: 01      Voice Msg Only: N
  Roamer Reset: 01:00   Follow Me: N
  Mobile to Mobile: Y   Voice Msg: N
  ----- Forwarding -----
  To: phone:Y   mobile:Y   voice msg:N
  On: busy:Y   no answer:Y
  Max Forwarded Call Time Limit: 005

  Ring Out Time:          35
  User Message Prompt Limit: 045
  Voice Message Limit:    045
  Number of Messages:     30
  Retention Time:         168
  Announcement:           N
  Voice Announcement Limit:
  Phone Notify: N         Call Splitting: N
  Client Welcome Msg: N   Thank You: N
  Busy Queuing: N         Call Waiting: N

```

Figure 11-23. General COS #1

General COS #2 - Voice Messaging Users

The second class of service, shown in Figure 11-24, adds voice messaging capabilities to the standard class defined in #1.

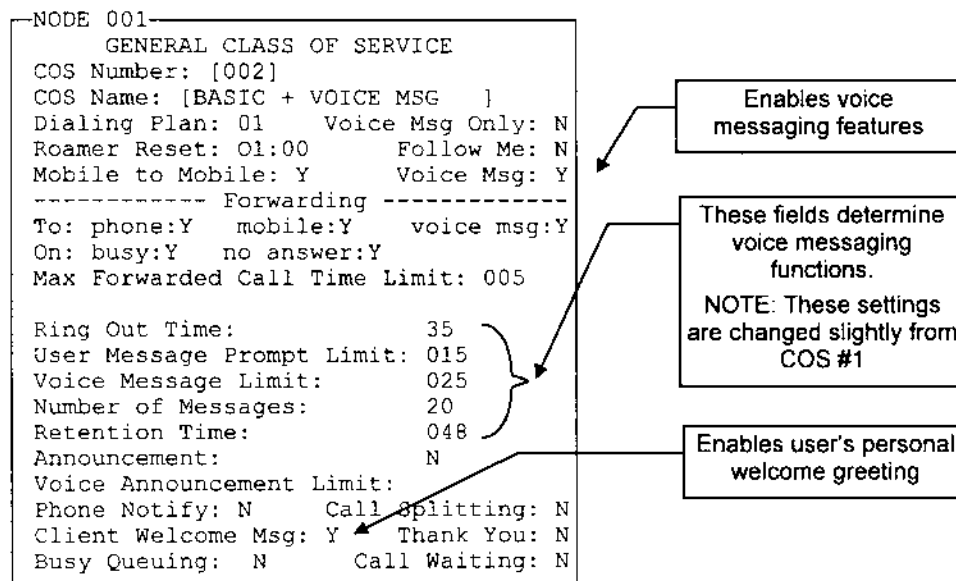


Figure 11-24. General COS #2

General COS #3 - Voice Message Notify Users

The third class of service, shown in Figure 11-25, adds phone notification capabilities to the class defined in #2. When users in COS 003 have an unretrieved voice message, they will hear “message beeps” upon key-up. (See “Programming a Node User” in Section 4 for more details on this feature.)

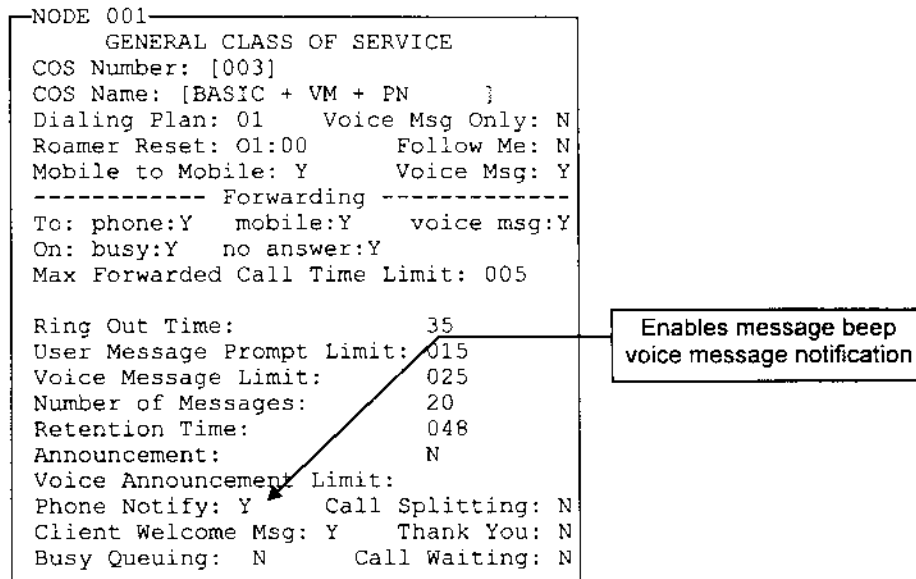


Figure 11-25. General COS #3

General COS #4 - Roaming Users

The fourth class of service, shown in Figure 11-26, adds network roaming capabilities to the class defined in #3.

Section 11. Example Databases

```

NODE 001
  GENERAL CLASS OF SERVICE
  COS Number: [005]
  COS Name: [ROAM + VM + PN +CF ]
  Dialing Plan: 01      Voice Msg Only: N
  Roamer Reset: 01:00   Follow Me: Y
  Mobile to Mobile: Y   Voice Msg: Y
  ----- Forwarding -----
  To: phone:Y  mobile:Y  voice msg:Y
  On: busy:Y   no answer:Y
  Max Forwarded Call Time Limit: 005

  Ring Out Time:          35
  User Message Prompt Limit: 015
  Voice Message Limit:    025
  Number of Messages:     20
  Retention Time:         048
  Announcement:           N
  Voice Announcement Limit:
  Phone Notify: Y         Call Splitting: N
  Client Welcome Msg: Y   Thank You: N
  Busy Queuing:  N        Call Waiting: N

```

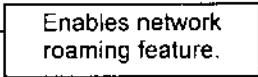


Figure 11-26. General COS #4

Node Users

Every FASTNet Node User can have *at least* one Model 49 User ID specified for inbound Model 49 calling from FASTNet. Any number of Model 49 User IDs, from different LTR™ systems, could be specified to dial into one Node User ID code. In effect, a mobile user has one FASTNet phone number and as many LTR™ user IDs as necessary to roam into other sites (see Figure 11-27).

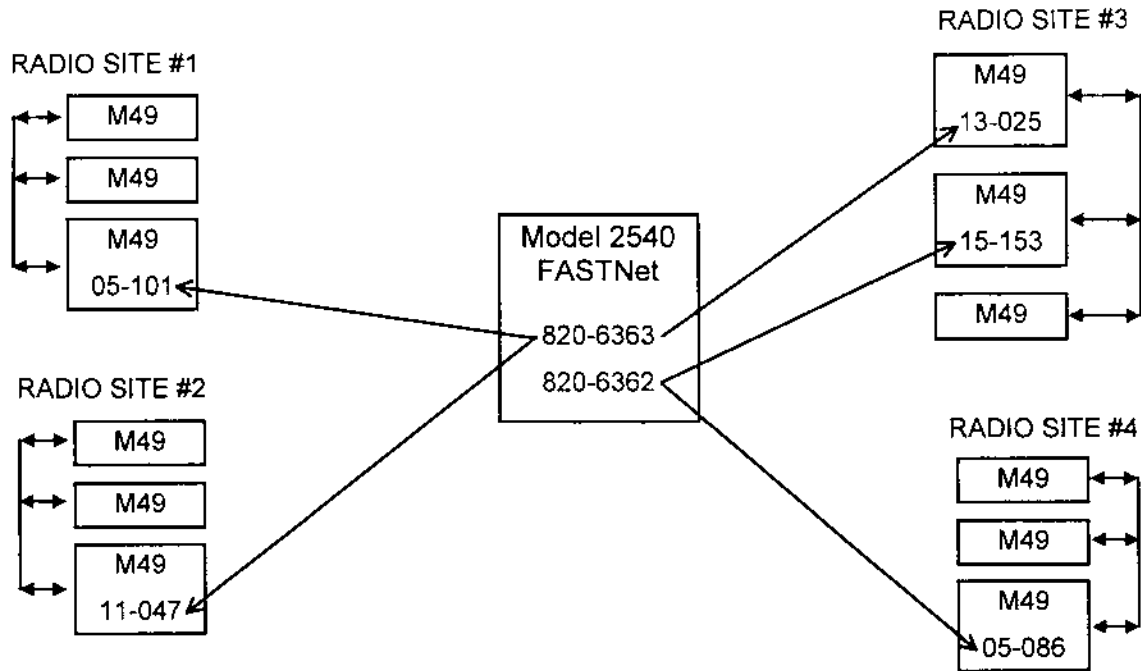


Figure 11-27. FASTNet Node User to Ebase/Multibase User ID Mapping

In this example, FASTNet Node User 820-6363 can roam between Radio Sites 001 (LTR™ ID = 05-101), 002 (LTR™ ID = 11-047), and 003 (LTR™ ID = 13-025). FASTNet Node User 820-6362 can roam between Radio Sites 003 (LTR™ ID = 15-153) and 004 (LTR™ ID = 05-086). (The Roam COS must be setup appropriately for each Node User.)

When a mobile is “networking” through the FASTNet system, and several Model 49 sites are specified for each “roamer” Node User ID, FASTNet presents a list of Model 49 over dial ID codes to be used (one ID code per Model 49 site). If multiple Model 49 User IDs from one Model 49 Site all vector to a single FASTNet Node User ID code, warnings are generated when the database is stored, but operation is not blocked (see Figure 11-28).

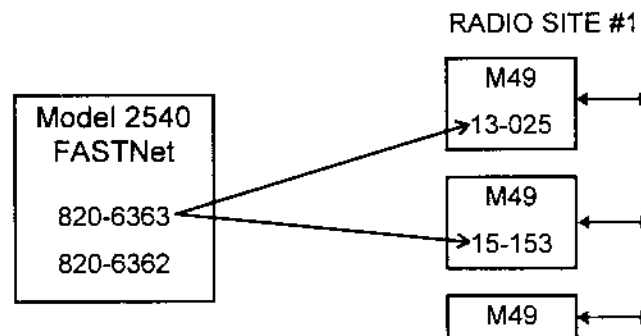


Figure 11-28. Multiple LTR™ IDs Mapped to One FASTNet Node User

In this example, two LTR™ IDs from one Radio Site are mapped to the same FASTNet Phone number. Although the FASTNet will process calls normally for this correspondence, it

Section 11. Example Databases

does not create any roaming capabilities for the user. A warning is issued when the database is stored to alert the system operator to a possible programming error.

Node User # 1 - Network Roaming Not Allowed

The first Node User example shows the relationship between the Model 49 user record and the Node User record for a mobile with voice messaging privileges, but no call forwarding or roaming between sites. Notice the over dial digits defined for Site 001 in Roaming COS 001, shown in Figure 11-29, are the mobile user's LTR™ ID (03-133) for the Pottsville Model 49 site.

NODE 001

NODE USERS
Phone #: [7678133]
Name: [REGULAR JOE]
User Type: [N] Valid: [V]
Homed on this Node: Y ...
Personal Passcode: 0123

CLASS OF SERVICE (COS) -----
General: 002 Toll: 001 Roaming: 001

INI OVER_DIAL
Initial Mode COS R
All Calls:N. 001 PO Site Over Dial
Message Noti 002 EL 001: 03133
Final Destin 003 EL

BIL 010 SA
Acct No: 001
Bill Duplica
Comment:
Create Date:
Alter Date:

Annotations:

- Arrow points from "User's unique network phone number" to Phone #: [7678133]
- Arrow points from "Roaming COS #1, over dial digits = LTR™ User Id in Ebase (See Figure 11-30)" to 001: 03133

Figure 11-29. Node User #767-8133

Conversely, the window displayed in Figure 11-30 shows the Model 49 User ID record for user 03-133 at the Pottsville Model 49 site (access via Ebase / Edit49 / User ids / LTR User Type (I) / Extended Type (R)...). Notice the Extended Type is set to R and the Network Phone Number is 767-8133, which is the FASTNet *Node User* number.

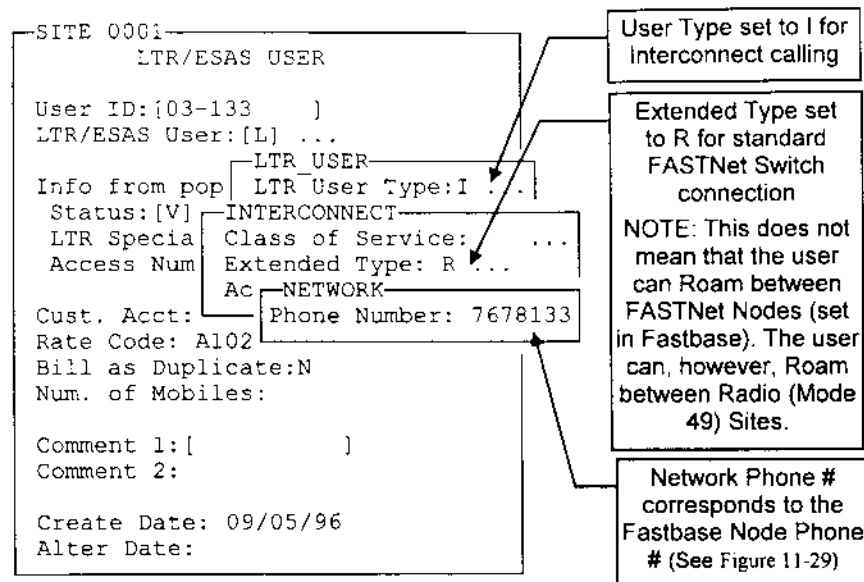


Figure 11-30. Ebase LTR™ User #03-133

If the Fastbase Node User configuration and the Ebase or Multibase User Ids don't coincide, the FASTNet Switch cannot properly process calls to and from the Model 49s. Two possible scenarios can arise:

- the FASTNet → M49 data is incorrect (check Fastbase settings in Figure 11-29)
- the M49 → FASTNet data is incorrect (check Ebase or Multibase settings in Figure 11-30)

In case (1), the FASTNet Node User ID parameters which vector to the Model 49 ID are missing. NO calls can be directed to the mobile radios for that particular Node User. The result is that all inbound calling is inhibited. Outbound calling from the Model 49 to FASTNet functions normally (if properly configured).

In case (2), the Model 49 User ID parameters which vector to the FASTNet Node User ID are missing. All outbound calls initiated from the Model 49 through FASTNet are logged to Node User ID "999-9999", if Roaming is allowed in the FASTNet Switch. Inbound calling to the FASTNet system is not affected (if properly configured).

1

1

1

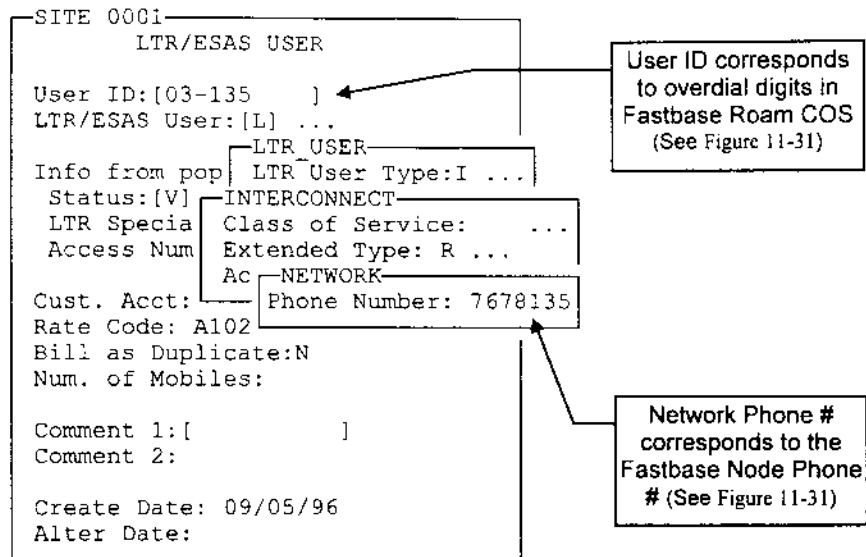


Figure 11-32. Ebase LTR™ User #03-135 (Pottsville Site)

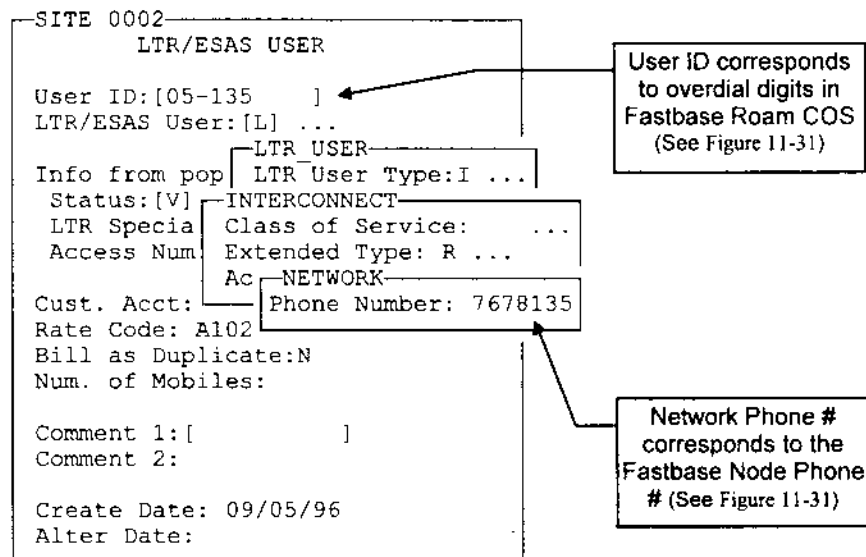


Figure 11-33. Ebase LTR™ User #05-135 (Elk Mountain Site)

Node User #3 - Network Dispatch

The third Node User record is a Network Dispatch mobile user. FASTNet "Network Dispatch" users must **not** be confused with E.F. Johnson LTR™ "Dispatch" users. In fact, network dispatch users are LTR™-compatible *interconnect* mobiles that are connected into a single *half-duplex* 'party call' which spans multiple sites and/or nodes.

The network dispatch records define which Model 49 Sites are included in a network dispatch call. In the future, other FASTNet Switches (nodes) will also be included in a network dispatch call. Currently, *only Radio Sites* can be included in a network dispatch call, and all

Section 11. Example Databases

sites *must be* Model 49 sites. Figure 11-34 shows a typical network dispatch user record, which is accessed from Fastbase editNet / Node users / Dispatch Number or Script Number (D).

Note that only the *Radio Site* numbers to be included in the call are defined in this record. The FASTNet Switch establishes the communication link with the Model 49 site, and then sends the Node User phone number to the Model 49s. The Model 49 units look up the Network Phone Number in the Model 49s database to find the LTR™ ID to ring out to.

----- NODE 001 -----

 NODE USERS

Phone #: {7678134}

Name: {JOE DISPATCH}

User Type: [D] Valid: [V]

Homed on t-----DISPATCH_USER-----

Personal P

 Please see HELP Window.

----- CLA -----

General: Dispatch Type: F

----- I ----- Linkup Timeout: 10

-----DISPATCH_SITE-----

Site No.	Site No.	Site No.	Site No.
1. 001	2. 002	3.	4.
5.	6.	7.	8.
9.	10.	11.	12.
13.	14.	15.	16.
17.	18.	19.	20.
21.	22.	23.	24.

network Dispatch user

Enter Y in the Enter Sites field to access this window. Then select the Radio Sites that the included mobiles are homed on.

Figure 11-34. Node User #767-8134

The Ebase User ID records for each Network Dispatch mobile are shown in Figure 11-35 and Figure 11-36.

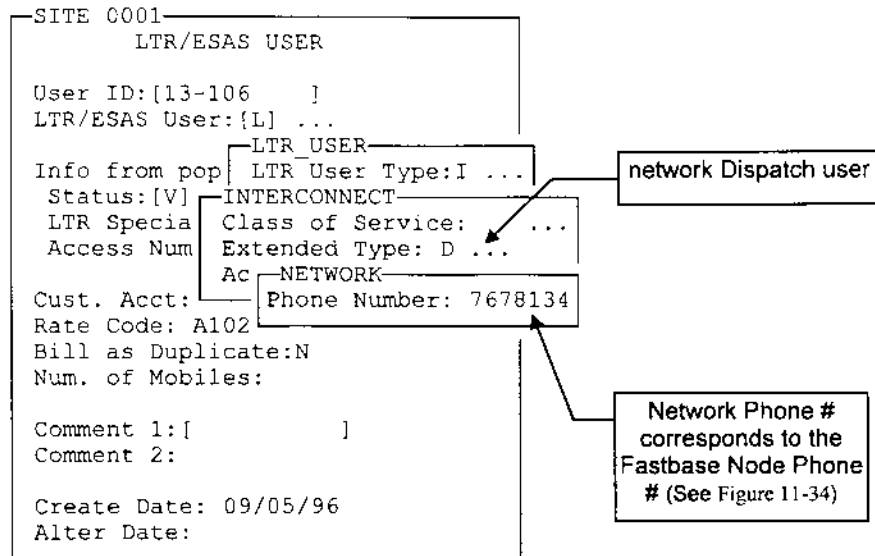


Figure 11-35. Ebase LTR™ User #13-106 (Pottsville Site)

Notice that two critical parameters are set the same for both Model 49 Site User Ids in Ebase:

1. Edit49 / User ids / LTR User Type (I) / Extended Type is set to D, and the Network window Phone Number field is "7678134" for both of the sites.
2. Also note that these mobiles must operate *half-duplex* (set in the Ebase LTR or ESAS Class of Service) for Network Dispatch to operate properly.

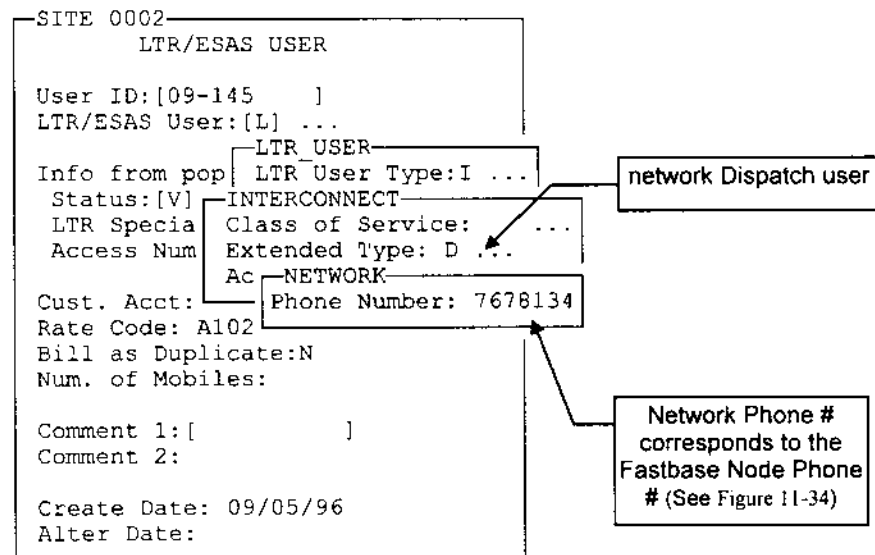


Figure 11-36. Ebase LTR™ User ID #09-145 (Elk Mountain Site)

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Node User Records

And lastly, some examples of Node User records are provided. The following list of Node User records is taken from the list produced by the Printnet / node Users menu item of Fastbase. The script files listed are used for processing inbound calls to FASTNet only, outbound dialing is processed in a different manner.

Node User ID 1000000	Invokes a script which handles the communication link with <i>directly connected</i> Model 49s. Model 49 units are “directly connected” when they are interfaced with FASTNet E&M 4-wire trunks via wire, RF link, or microwave link and do not involve telco signaling protocol. This script runs whenever directly connected Model 49 initiates a phone call to the FASTNet Switch. <i>This script is initially loaded in all FASTNet Switches at the factory.</i>
Node User ID 1000001	Invokes a script which processes Model 49 communications via a telco link. Model 49 units which must be interfaced via the telco Central Office (CO), telco switch, or PABX system must communicate with this script to handle the telco protocol while establishing and disconnecting the lines. <i>This script is initially loaded in all FASTNet Switches at the factory.</i>
Node User ID 1000002	Invokes a script used to decode inbound digits which are directly (manually) entered by the calling party. This script is typically used for End-to-End trunks where the inbound calling party dials/rings the line via the telco CO or PABX, FASTNet answers (with or without a prompt - as programmed), and then the calling party overdials the required digits to cause ring-out to the Node User (mobile transceiver). <i>This script is initially loaded in all FASTNet Switches at the factory.</i>
Node User ID 1000003	Invokes a script used to decode inbound feed digits which are generated from the telco or PABX switch. This script is typically used for DID trunks where the inbound calling party dials into the telco or PABX, and the telco switch then translates the 7-digit number into “feed digits”, rings FASTNet, and transmits the feed digits to FASTNet upon answer. Finally the audio from/to the calling party is connected after the call is established. <i>This script is initially loaded in all FASTNet Switches at the factory.</i>

Section 11. Example Databases

Node User ID 1000004	Invokes a script which handles an inbound call from an E F Johnson RIC. Basically, it acts like a CO to the Johnson RIC, so that mobile-originated calls on the Johnson RIC proceed as normal. Using this script requires a hardware modification to the Johnson RIC, to facilitate E&M 4-wire direct interface to FASTNet. <i>This script is loaded by Zetron per Model 2540 order specifications, or downloaded via modem.</i>
Node User ID 1000005	Invokes a script which handles inbound calls from the Bear Creek CO of our sample database. Recall that these are FX trunks from a neighboring CO. This script allows callers to call in from the Bear Creek CO and over dial the LTR ID number of the mobile they are trying to reach. <i>This script was created by Fastbase.</i>
Node User ID 7678133	This ID is a normal FASTNet user. This record shows the client name, billing information, COS specifications, voice recording settings, and the Model 49 site and over dial information.
Node User ID 7678134	This ID is a "Network Roamer" Node User ID number. The record shows pertinent billing information, the number of mobiles sharing this ID code, the type of dispatching to perform ("F"= find ID codes & drop all unused repeaters), and the table of sites dispatched.
Node User ID 7678135	This ID is a normal FASTNet "roaming" node user. This record shows the client name, billing information, COS specifications, voice recording settings, and the Model 49 site and over dial information.
Node User IDs 7678997 and 7678998	These IDs allow the office PC to make a modem connection to the internal modem on one of the Model 49s, at the Pottsville or Elk Mountain site, respectively. This setup doesn't require a dedicated phone line and external modem to be able to program the Model 49s remotely. <i>These scripts are set up in Fastbase.</i>

Section 11. Example Databases

Node User ID 9999999

This ID is a user record dedicated to *all* the interconnect mobile users in the system who *do not* have a FASTNet phone number. All those users can still make outgoing calls through the FASTNet Switch. This user record tells FASTNet how to route calls and toll restrict the digits dialed by the mobile. This *special* Node User ID must be programmed into FASTNet, with desired restrictions, to be utilized. (*This is useful for radio users who are "roaming" in the traditional sense; i.e. visiting system users who traveled into the service area and are using the system temporarily at a flat rate such that billing details are not important.*)

FASTNet Sample Database Node Users Printout

DATABASE nusr001, sorted by Number -- PAGE 1
Tue May 30 15:52:17 1995

FASTNet ROAMING USERS

1000000 - Phone Number	Name: PROCESS 49 COMMANDS	INVOKES SCRIPT
This Number invokes Script: M49CMDS		
Parameters:		
Comment:	Create Date: 03/18/94	Alter Date:
1000001 - Phone Number	Name: PROCESS 49 DIAL UP	INVOKES SCRIPT
This Number invokes Script: M49DCMS		
Parameters:		
Comment:	Create Date: 03/18/94	Alter Date:
1000002 - Phone Number	Name: GET OVER DIAL DIRECT	INVOKES SCRIPT
This Number invokes Script: GETODIAL		
Parameters:		
Comment:	Create Date: 03/18/94	Alter Date:
1000003 - Phone Number	Name: GET OVER DIAL NORMAL	INVOKES SCRIPT
This Number invokes Script: PULSEDID		
Parameters:		
Comment:	Create Date: 03/18/94	Alter Date:
1000004 - Phone Number	Name: GET RIC INBOUND CALL	INVOKES SCRIPT
This Number invokes Script: MRIC		
Parameters: 30		
Comment:	Create Date: 04/03/95	Alter Date:
1000005 - Phone Number	Name: BEAR CREEK OVERDIAL	INVOKES SCRIPT
This Number invokes Script: GETODIAL		
Parameters: 5'30'1'60'3		
Comment:	Create Date: 04/03/95	Alter Date:

Section 11. Example Databases

7678133 - Phone Number Name: REGULAR JOE FASTNet USER
 Account Number: Rate Code:
 Bill as Duplicate: N Number of Mobiles: 001
 Class of Services - General: 002 Toll: 001 Roaming: 001
 User Homed on this Node, Site: 001
 Personal Passcode: 0123 Initial Mode: R
 Forwarding - All Calls: None
 On Busy : Mail Box
 No Answer: Mail Box
 Mail Notification: Beep
 Final Destination: None
 Over Dial Digits: Site Over Dial
 001: 03133

Comment: Create Date: 05/30/95 Alter Date:

7678134 - Phone Number Name: NETWORK DISPATCH JOE NETWORK DISPATCH
 Account Number: Rate Code:
 Bill as Duplicate: N Number of Mobiles: 001
 Dispatch Type: F Linkup Timeout: 10
 Site Site Site Site Site Site Site Site
 No. No. No. No. No. No. No. No.
 01. 001 02. 002 03. 04. 05. 06. 07. 08.
 09. 10. 11. 12. 13. 14. 15. 16.
 17. 18. 19. 20. 21. 22. 23. 24.
 25. 26. 27. 28. 29. 30. 31. 32.

Comment: Create Date: 05/30/95 Alter Date:

7678135 - Phone Number Name: ROAMING JOE FASTNet USER
 Account Number: Rate Code:
 Bill as Duplicate: N Number of Mobiles:
 Class of Services - General: 004 Toll: 001 Roaming: 003
 User Homed on this Node, Site: 001
 Personal Passcode: 2345 Initial Mode: R
 Forwarding - All Calls: None
 On Busy : Mail Box
 No Answer: Mail Box
 Mail Notification: Beeps
 Final Destination: None
 Over Dial Digits: Site Over Dial
 001: 03135
 002: 05135

Comment: Create Date: 05/30/95 Alter Date:

7678997 - Phone Number Name: PROGRAMM POTTSVILLE INVOKES SCRIPT
 This Number invokes Script: PSITE001
 Parameters:
 Comment: Create Date: 05/03/95 Alter Date:

7678998 - Phone Number Name: PROGRAM ELK MOUNTAIN INVOKES SCRIPT
 This Number invokes Script: PSITE002
 Parameters:
 Comment: Create Date: 05/03/95 Alter Date:

Section 11. Example Databases

```
9999999 - Phone Number      Name: GENERIC ROAMER      FASTNet USER
Account Number:              Rate Code:
Bill as Duplicate: N        Number of Mobiles:
Class of Services - General: 001    Toll: 001    Roaming: 003
User Homed on this Node, Site: 001
Personal Passcode:          Initial Mode: R
Forwarding - All Calls: None
                        On Busy : None
                        No Answer: None
Mail Notification: None
Final Destination: None
Over Dial Digits:  Site    Over Dial
                        001:    20250
                        002:    20250

Comment:                    Create Date: 03/28/95    Alter Date: 05/30/95

Total Records Printed: 12

* * * End of Listing * * *
```

EXAMPLE #2 - OUTDIALING

This example is designed to illustrate some common applications in a FASTNet Switch Network. The pertinent database screens are provided to help configure a similar system.

Trunk Groups Configuration

Some examples are useful to illustrate the process for generating outdial programs. To begin, determine how many and what type of trunk lines are physically connected to the switch, and which trunk group each line belongs to. The trunk groups are configured as shown in Table 11-3.

Table 11-3. Trunk Groups Programming

Trunk Group Number	Number of Trunk Lines	Description
1	3	Local CO (DTMF)
2	2	MF Trunk Lines
3	1	FX Trunk Line (20 prefixes)

One of the TCE trunk group configurations (31) is shown in Figure 11-37.

```
FASTNet Trunk Card Config. Editor V1.6 (c)1993-96 Zetron      (SUPERVISOR mode)
```

INDEX

TG	COMMENT
01	LOCAL CO (DTMF)
02	MF TRUNK LINES
03	FX TRUNK LINE

NODE 008954

TRUNK GROUP CONFIGURATION

Trunk Group: [01]
Comment: [LOCAL CO (DTMF)]

Voice Prompts: B
Security: Y
Wink Limit: 04
Hunt Method: LOWEST ...

Create Date: 09/04/96
Alter Date:

HELP

Edit: press ENTER/RETURN/<--+

Guide Window: F1

Done: Esc

Figure 11-37. TCE Trunk Groups Configuration

Section 11. Example Databases

Outdial Program

Assume that this particular site has access to cut-rate local long distance fares by first dialing a local number, then an access code, followed by the destination number dialed. Figure 11-38 through Figure 11-41 show the outdial programs that could be used.

To setup outdial programs for this example, four different outdial programs are required: one echoes 'local' calls out the local trunk group, one processes long distance calls via the cut-rate carrier on the local trunk group, one uses the MF trunk group, and one uses the FX trunk group.

Outdial Program #1

In this example, the FASTNet Switch is instructed to echo all the dialed digits out the trunk line for normal local dialing. Refer to Figure 11-38.

Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)

INDEX

NO	Program Name
01	LOCAL CALLS
02	DX CARRIER CALLS
03	MF DIALING
04	FX DIALING

HELP

Edit: press ENTER/RETURN/<-+

Guide Window: F1

Done: Esc

NODE 001

OUTDIAL PROGRAM

Program Number: {01}

Program Name: [LOCAL CALLS]

Command	Parameters
1. ECHOALL	
2. END	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

Sends ALL dialed digits to the outbound trunk.

End of program.

Figure 11-38. Outdial Program #1

Outdial Program #2

In this example, the FASTNet Switch is instructed to:

- dial a specific local number (567-1234) to access the long-distance carrier
- pause (2 seconds)
- dial an access code (6789)
- detect dial tone
- echo all the dialed digits excluding the (1) prefix

Figure 11-39 illustrates how to setup this type of outdial program.

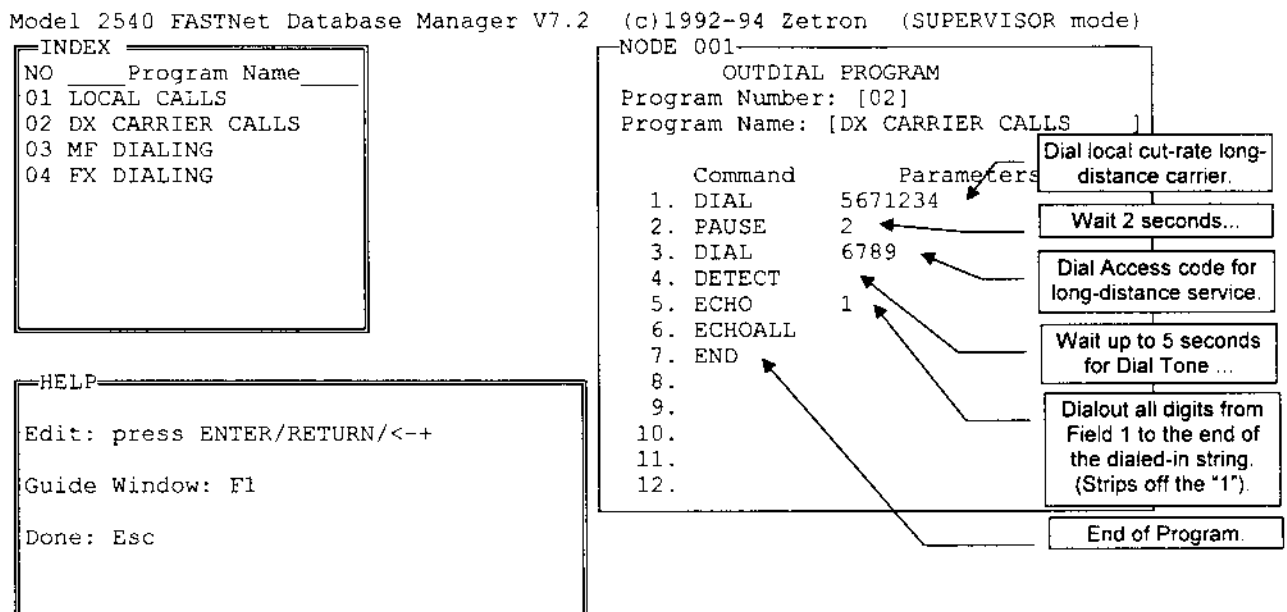


Figure 11-39. Outdial Program #2

Outdial Program #3

In this example, the FASTNet Switch is instructed to:

- process the MF dialing
- translate the dialed digits into a MF format digit string
- dial to the telco

Figure 11-40 illustrates how to setup this type of outdial program.

Section 11. Example Databases

Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)

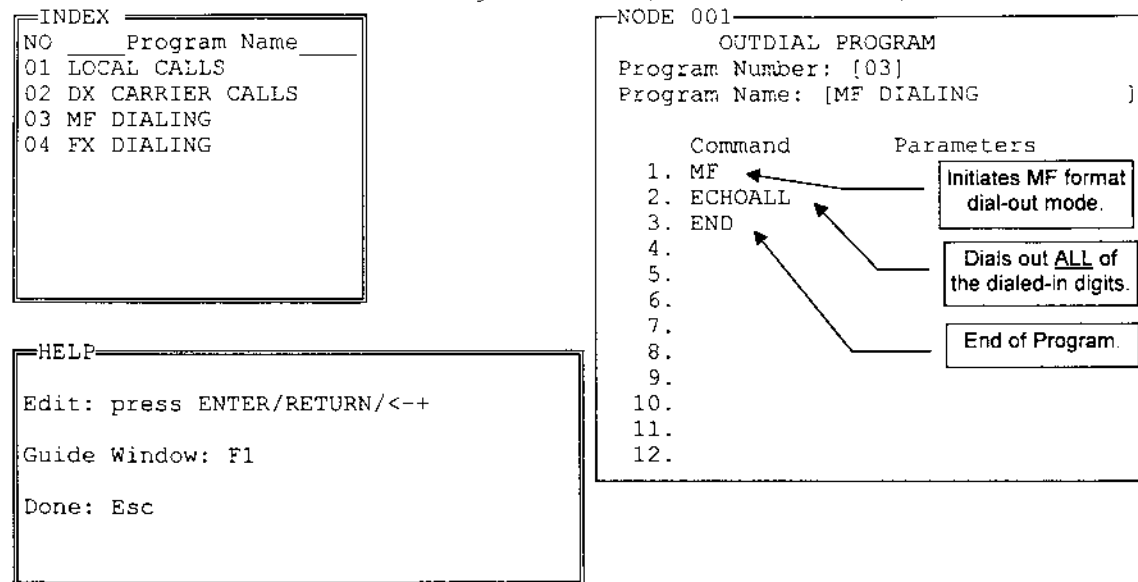


Figure 11-40. Outdial Program #3

Outdial Program #4

In this example, the FASTNet Switch is instructed to:

- strip off the 1 from 1+local long distance numbers
- echo the remaining digits to the FX trunk line

Figure 11-41 illustrates how to setup this type of outdial program.

Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)

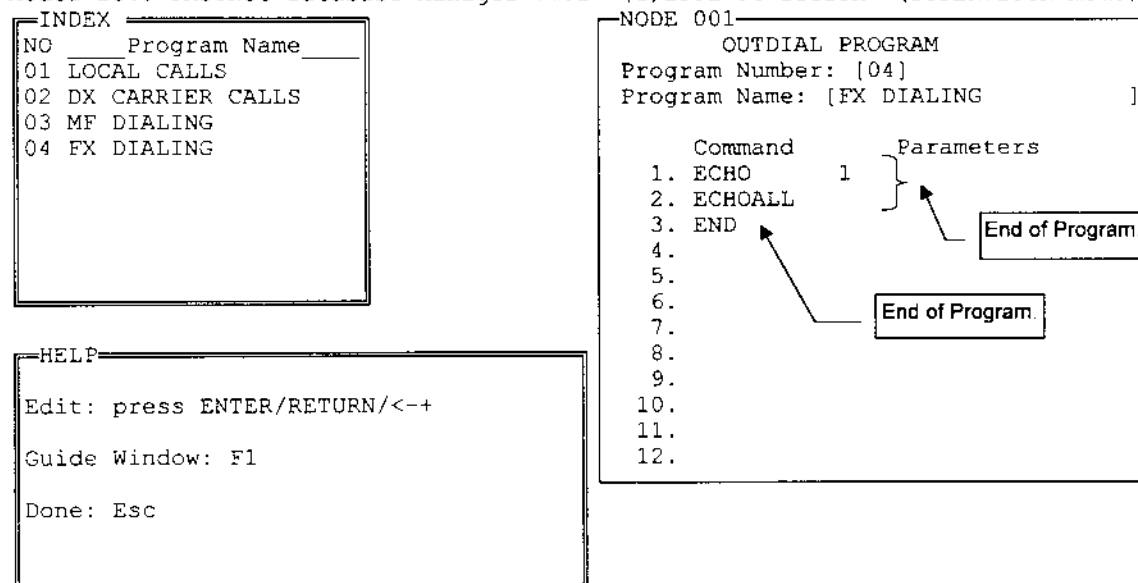


Figure 11-41. Outdial Program Example #4

Least Cost Routing

The following examples define Least Cost Routing tables for the trunk groups of Table 11-3, and the Outdial Program examples given in Figure 11-39 through Figure 11-41.

LCR #1 - Local Calls

The FASTNet Switch should begin processing local numbers as shown in Figure 11-42. All local calls are routed out one of the three trunk lines to the local CO, if possible. This is achieved in outdial program #1, which echoes all the digits. If none of the local lines are available, the MF trunks can be used, provided that they are E&M 4-wire hardware / telco trunks. The MF trunks are used last since they are primarily for incoming calls.

Dual Telco Card DID hardware is normally connected to telco DID-only lines, which *do not* support outdialing.

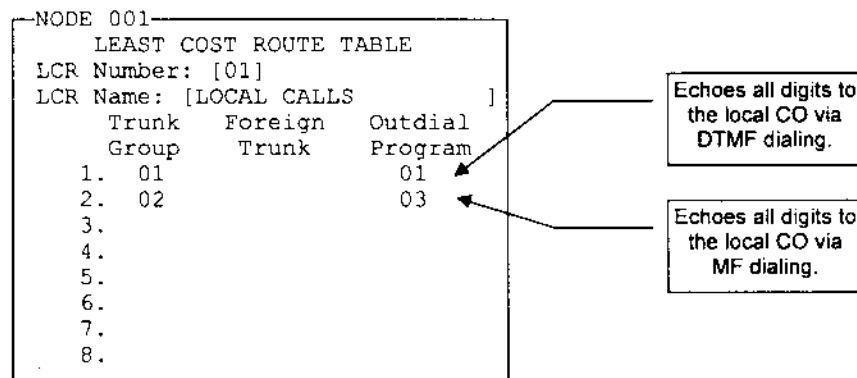


Figure 11-42. Least Cost Route Table #1: Local Calls

LCR #2 - "1-800" Calls

The next type of calls which may be encountered are "1-800" calls, which are normally treated as local calls. Refer to Figure 11-43. In the USA, if these calls are not specifically routed to the local lines, they use the local cut-rate carrier, which is not a toll-free call.

Section 11. Example Databases

NODE C01			
LEAST COST ROUTE TABLE			
LCR Number: [02]			
LCR Name: [1-800 CALLS]			
	Trunk	Foreign	Outdial
	Group	Trunk	Program
1.	01		01
2.	02		03
3.			
4.			
5.			
6.			
7.			
8.			

Echoes all digits to the local CO via DTMF dialing.

Echoes all digits to the local CO via MF dialing.

Figure 11-43. Least Cost Route Table #2: 1-800 Calls

LCR #3 - Local, Long-Distance Calls

The third group of calls that need routing are local long distance calls (1 + local number) that are local to the FX (Foreign Exchange) line. When routing these calls, the FX trunk is tried first with outdial program #4 to strip off the '1', as shown in Figure 11-44. If the FX line is busy, then the local trunks are tried using outdial program #2 which uses the local long distance carrier. As a final resort, the local trunks are tried with a '1' + dialing string.

NODE 001			
LEAST COST ROUTE TABLE			
LCR Number: [03]			
LCR Name: [FX LOCAL LONG DIST]			
	Trunk	Foreign	Outdial
	Group	Trunk	Program
1.	03		04
2.	01		02
3.	01		01
4.			
5.			
6.			
7.			
8.			

Strips off "1", then dials remaining digits, to be routed to the "FX" trunk.

Strips off "1" and dials remaining digits via the long distance cut-rate carrier service.

Echoes all digits via the local trunks, using 1+ dialing.

Figure 11-44. Least Cost Route Table #3: FX Local Long Distance Calls

LCR #4 - Long Distance Carrier Service Calls

The fourth routing category in this example, illustrated in Figure 11-45, is long distance calls that are *not local* to the FX line. The preferred routing is to the cut-rate long distance carrier company.

NODE 001

LEAST COST ROUTE TABLE		
LCR Number: [04]		
LCR Name: [LONG DX CARRIER SVC ;		
	Trunk	Outdial
	Group	Program
1.	01	02
2.	01	01
3.	02	03
4.		
5.		
6.		
7.		
8.		

Dials local cut-rate long distance carrier service, then strips "1" from dialed

Dials local trunk and echoes "1+" dialed digits via DTMF dialing.

Dials MF trunk and echoes "1+" dialed digits via MF protocol.

Figure 11-45. Least Cost Route Table #4: Long Distance Carrier Service

LCR #5 - Emergency and Operator-Assisted Calls

The fifth routing category in this example includes emergency '911' calls and '0' for the operator. These calls should be routed only to the local trunks. This LCR routine is shown in Figure 11-46.

NODE 001

LEAST COST ROUTE TABLE		
LCR Number: [05]		
LCR Name: [OPERATOR, 911 ;		
	Trunk	Outdial
	Group	Program
1.	01	01
2.	02	03
3.		
4.		
5.		
6.		
7.		
8.		

Echoes all digits to the local CO via DTMF dialing.

Echoes all digits to the local CO via MF dialing.

Figure 11-46. Least Cost Route Table #5: 911 and 'O' Calls

Section 11. Example Databases

LCR #6 - Standard Long Distance Calls

All other long distance calls use the MF trunk group as specified in LCR table example #6, shown in Figure 11-47.

NODE 001			
LEAST COST ROUTE TABLE			
LCR Number: [06]			
LCR Name: [1+ LONG DISTANCE]			
	Trunk	Foreign	Outdial
	Group	Trunk	Program
1.	02		03
2.			
3.			
4.			
5.			
6.			
7.			
8.			

Echoes all dialed digits to the CO via MF protocol.

Figure 11-47. Least Cost Route Table #6: 1 + Long Distance

Dialing Plans

Dialing plans are setup to correspond to the examples shown in the previous subsections as follows:

- All local numbers (NXX-XXXX) are assigned LCR #1. (See Figure 11-42)
- Toll-free, '1-800' calls are assigned LCR #2. (See Figure 11-43)
- Certain '1+' local long distance numbers are assigned LCR #3. (See Figure 11-44)
- Long distance calls to the cut-rate carrier are assigned LCR #4. (See Figure 11-45)
- Emergency and operator assisted calls are assigned LCR #5. (See Figure 11-46)
- All others are assigned LCR #6. (Standard long distance calls, Figure 11-47)

The sample dialing plan shown in Figure 11-48 uses Least Cost Route (LCR) numbers from our previous examples.

Section 11. Example Databases

```
Model 2540 FASTNet Database Manager V7.2 (c)1992-94 Zetron (SUPERVISOR mode)
```

INDEX	
NO	Dialing Plan Name
01	SAMPLE PLAN 1
02	SAMPLE PLAN 2

HELP	
Edit: press ENTER/RETURN/<--+	
Guide Window: F1	
Done: Esc	
WARNING: Route(s) must be defined before Dial Plan can be saved.	

NODE 001	
DIALING PLAN	
Plan Number: [01]	
Plan Name: [SAMPLE PLAN 1]	
Digit Plan	Route Number
1. 411	01
2. 911	05
3. 0	05
4. NXX XXXX	01
5. 1 800 Z	02
6. 1 XXX XXXX	03
7. 1 222 XXXX	04
8. 1 234 XXXX	04
9. 1 333 XXXX	04
10.	
11.	
12.	
13.	
14.	
15.	
16.	
Next Page: N ... 00 On Next Page	

Figure 11-48. Dialing Plan Screen

EXAMPLE #3 – SCRIPTS

This example illustrates applications of scripts. The three scripts that provide special forwarding features are exemplified first, followed by an example of TeamTalk.

Forwarding

This example system has two trunk groups: the one in the local city feeds 820-xxxx numbers, and the one in another city feeds 488-xxxx numbers. Bill's mobile number is 820-6363. When callers call Bill's mobile number (820-6363), his mobile rings (no forwarding unless busy or no answer). For callers in the other city, which is in a long-distance (foreign exchange) area (488), he has a toll-avoidance number, 488-6363. This number gives Bill a local calling presence in the other city. When callers call this number, the call is forwarded to Bill and his mobile rings exactly as if the caller had called 820-6363.

For callers who just want to leave a message without talking to Bill or for callers Bill wants to screen, he has a leave-message-only number, 820-6301. When callers call this number, they are immediately put into voice messaging.

To make his project information available and to allow callers to redirect their calls after hours, Bill has a caller-directed-call-routing number, 820-6400 with choices 1 through 4. When callers call this number, they hear an announcement describing the choices 1 through 4. If they press 1, the call is forwarded to 820-6301 so the caller can leave a message for Bill to check the next morning. If they press 2, Bill's mobile 820-6363 is called. If they press 3, Bill is paged. If they press 4, they hear an announcement about the current status of his projects.

Section 11. Example Databases

Node Configuration

Figure 11-49 illustrates the Node User screen for Bill's LTR mobile (820-6363) that has forward to voice messaging on busy or no answer .

```

NODE 001
      NODE USERS
Phone #: [8206363]
Name: [BILL'S MOBILE      ]

User Type: [N]      Valid: [V]
Homed on this Node: Y ...
Personal Passcode:

----- CLASS OF SERVICE (COS) -----
General:001 Toll:001   Roaming:001
----- INITIAL FORWARDING -----
Initial Mode: R
All Calls:N.. Busy: M  No Answer: M
Message Notification: Beeps
Final Destination:    N ...
----- BILLING INFORMATION -----
Acct No:              Rate Code:
Bill Duplicate: N     Num. Mobiles:
Comment:
Create Date: 08/16/99
Alter Date: 08/17/99

```

Figure 11-49. Node User for #820-6363

Figure 11-50 illustrates the node user and script screen for the foreign exchange number (488-6363) in the FASTNet switch that is forwarded to Bill's mobile (820-6363).

```

NODE 001
      NODE USERS
Phone #: [4886363]
Name: [820-6363 FX #      ]

User Type: [S]      Valid: [V]
RUN_SCRIPT

Please see HELP Window.

Script Name: IFORWARD
Parms: 8206363

Message Notification: ...
Final Destination:    N ...
----- BILLING INFORMATION -----
Acct No:              Rate Code:
Bill Duplicate: N     Num. Mobiles:
Comment:
Create Date: 08/16/99
Alter Date: 08/17/99

```

Figure 11-50. Node User and Run Script Window for the Bill's Local Presence in 488

Figure 11-51 illustrates the node user and script screen for Bill's leave-message-only number (820-6301).

NODE 001	
NODE USERS	
Phone #: [8206301]	
Name: [leave message only #]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: FWDVMESS	
Parms: 8206363	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 11-51. Node User and Run Script Window for Leave-Message-Only

Figure 4-52 through Figure 11-58 illustrate the screens for Bill's caller-directed call routing number.

NODE 001	
NODE USERS	
Phone #: [8206400]	
Name: [Bill's callerd #]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: CALLERD	
Parms: 0016400	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 4-52. Node User and Run Script Windows for the Caller-Directed Number

Section 11. Example Databases

NODE 001
 NODE USERS
 Phone #: [0016400]
 Name: [Bill callerd announ.]
 User Type: [N] Valid: [V]
 Homed on this Node: Y ...
 Personal Passcode: 1212
 ----- CLASS OF SERVICE (COS) -----
 General: 100 Toll: Roaming:
 ----- INITIAL FORWARDING -----
 Initial Mode: A
 All Calls: N.. Busy: No Answer:
 Message Notification:
 Final Destination: N ...
 ----- BILLING INFORMATION -----
 Acct No: Rate Code:
 Bill Duplicate: N Num. Mobiles:
 Comment:
 Create Date: 08/16/99
 Alter Date: 08/17/99

This field must be set to Network.
 This field must be set to Valid.
 This field must be set to the correct General COS.
 This field must be set to Announce.

Figure 11-53. Node User for Caller-Directed Call Base Number 0016400

NODE 001
 GENERAL CLASS OF SERVICE
 COS Number: [100]
 COS Name: [announcement]
 Dialing Plan: 01 Voice Msg Only: N
 Roamer Reset: 01:00 Follow Me: N
 Mobile to Mobile: Y Voice Msg: Y
 ----- Forwarding -----
 To: phone:Y mobile:Y voice msg:Y
 On: busy:Y no answer:Y
 Max Forwarded Call Time Limit: 005
 Ring Out Time: 35
 User Message Prompt Limit: 015
 Voice Message Limit: 025
 Number of Messages: 20
 Retention Time: 048
 Announcement: Y
 Voice Announcement Limit: 060
 Phone Notify: N Call Splitting: N
 Client Welcome Msg: Y Thank You: N
 Busy Queuing: N Call Waiting: N

This field must be used in the Node User, COS, General field (see Figure 11-53).
 This field must be set to Yes.
 This field must be set to Yes.
 This field must be set to allow enough time for the announcement.

Figure 11-54. General Class of Service for Announcement

Section 11. Example Databases

NODE 001	
NODE USERS	
Phone #: [0016401]	
Name: [choice1, mess only]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: FWDVMESS	
Parms: 8206363	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 11-55. Node User Screen for Choice 1 (Leave Message)

NODE 001	
NODE USERS	
Phone #: [0016402]	
Name: [choice2, forw to Bill]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: IFORWARD	
Parms: 8206363	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 11-56. Node User Screen for Choice 2 (Ring Bill's Mobile)

Section 11. Example Databases

```
-----NODE 001-----
                        NODE USERS
Phone #: [0016403]
Name: [choice3, page Bill]

User Type: [P]          Valid: [V]
Homed on this Node: Y ...
Personal Passcode:

----- CLASS OF SERVICE (COS) -----
General:001  Toll:001  Roaming:001
----- INITIAL FORWARDING -----
Initial Mode: R
All Calls:N.. Busy: M  No Answer: M
Message Notification: Beeps
Final Destination:    N ...
----- BILLING INFORMATION -----
Acct No:           Rate Code:
Bill Duplicate: N  Num. Mobiles:
Comment:
Create Date: 08/16/99
Alter Date:  08/17/99
```

Figure 11-57. Node User Screen for Choice 3 (Page Bill)

```
-----NODE 001-----
                        NODE USERS
Phone #: [0016404]
Name: [choice4,status    ]

User Type: [N]          Valid: [V]
Homed on this Node: Y ...
Personal Passcode:

----- CLASS OF SERVICE (COS) -----
General:100  Toll:      Roaming:
----- INITIAL FORWARDING -----
Initial Mode: A
All Calls:N.. Busy:      No Answer:
Message Notification:
Final Destination:      N ...
----- BILLING INFORMATION -----
Acct No:           Rate Code:
Bill Duplicate: N  Num. Mobiles:
Comment:
Create Date: 08/16/99
Alter Date:  08/17/99
```

Figure 11-58. Node User Screen for Choice 4 (Current Status Announcement)

Section 11. Example Databases

Node Users Printout

DATABASE nusr001, sorted by Number -- PAGE 1
Tue Aug 02 15:52:17 1999

FASTNet ROAMING USERS

```
0016400 - Phone Number      Name: Bill callerd announ.      FASTNet USER
Account Number:              Rate Code:
Bill as Duplicate: N         Number of Mobiles:
Class of Services - General: 100   Toll:           Roaming:
User homed on this Node, Site: 001
Personal Passcode: 1212      Initial Mode: A
Forwarding - All Calls: None
                        On Busy : None
                        No Answer: None
Mail Notification: None
Final Destination: None
Over Dial Digits:  Site   Over Dial
                        001:
Comment:                    Create Date: 08/16/99   Alter Date: 08/17/99

0016401 - Phone Number      Name: choicel, mess only      INVOKES SCRIPT
This Number invokes Script: FWDVMESS
Parameters: 8206363
Comment:                    Create Date: 08/16/99   Alter Date: 08/17/99

0016402 - Phone Number      Name: choice 2,forw to Bill  INVOKES SCRIPT
This Number invokes Script: IFORWARD
Parameters: 8206363
Comment:                    Create Date: 08/16/99   Alter Date:08/17/99

0016403 - Phone Number      Name: choice3, page Bill     Paging USER
Account Number:              Rate Code:
Bill as Duplicate: N         Number of Mobiles:
Class of Services - General: 001   Toll: 001
Paging Terminal Site: 200   Dial String: 5551212
Default Display: 0016403      Max Length of Display: 12
Send Reminder Pages: Y       How often: 030
Comment:                    Create Date: 08/16/99   Alter Date:08/17/99

0016404 - Phone Number      Name: choice4,status        FASTNet USER
Account Number:              Rate Code:
Bill as Duplicate: N         Number of Mobiles:
Class of Services - General: 100   Toll:           Roaming:
User homed on this Node, Site: 001
Personal Passcode:          Initial Mode: A
Forwarding - All Calls: None
                        On Busy : None
                        No Answer: None
Mail Notification: None
Final Destination: None
Over Dial Digits:  Site   Over Dial
                        001:
Comment:                    Create Date: 08/16/99   Alter Date:08/17/99

4886363 - Phone Number      Name: 820-6363 FX #         INVOKES SCRIPT
This Number invokes Script: IFORWARD
Parameters: 8206363
Comment:                    Create Date: 08/16/99   Alter Date:08/17/99
```

Section 11. Example Databases

```
8206301 - Phone Number      Name: leave message only #      INVOKES SCRIPT
This Number invokes Script: FWDVMESS
Parameters: 8206363
Comment:                      Create Date: 08/16/99   Alter Date: 08/17/99

8206363 - Phone Number      Name: BILL'S MOBILE                FASTNet USER
Account Number:              Rate Code:
Bill as Duplicate: N        Number of Mobiles:
Class of Services - General: 001    Toll: 001    Roaming: 001
User homed on this Node, Site: 001
Personal Passcode:          Initial Mode: R
Forwarding - All Calls: None
                        On Busy : Mail Box
                        No Answer: Mail Box
Mail Notification: Beeps
Final Destination: None
Over Dial Digits:  Site   Over Dial
                        001:   6363
                        002:   6363
                        003:   6363
                        004:   6363
                        005:   6363
Comment:                      Create Date: 08/16/99   Alter Date: 08/17/99

8206400 - Phone Number      Name: Bill's callerd #          INVOKES SCRIPT
This Number invokes Script: CALLERD
Parameters: 0016400
Comment:                      Create Date: 08/16/99   Alter Date: 08/17/99
```

Total Records Printed: 9

* * * End of Listing * * *

TeamTalk

In this example system, there are five directly connected sites and two TeamTalk groups. One group includes sites 2 – 5. Another group includes all sites, 1 – 5. To make a dispatch call to sites 2 – 5, group members key up 1111. To make a dispatch call to sites 1 – 5, group members key up 1234. So that a dispatch call can be made to sites 1 – 5 using a telco line, 820-1234 is programmed to forward to 1234.

Node Configuration

Figure 11-59 and Figure 11-60 illustrate the roaming COS screens set up for the two TeamTalk groups.

```

NODE 001
ROAMING SITES ENABLED
Roam COS Number: [001]
Roam COS Name: [all sites 1-5      ]

  Site#      Site#      Site#      Site#
1. 001      2. 002      3. 003      4. 004
5. 005      6.          7.          8.
9.          10.         11.         12.
13.         14.         15.         16.
17.         18.         19.         20.
21.         22.         23.         24.
25.         26.         27.         28.
29.         30.         31.         32.
33.         34.         35.         36.
37.         38.         39.         40.
41.         42.         43.         44.
45.         46.         47.         48.

Next Page? N ...      00 On Next Page

```

Figure 11-59. Roaming COS for All Sites TeamTalk Group

```

NODE 001
ROAMING SITES ENABLED
Roam COS Number: [002]
Roam COS Name: [ sites 2-5        ]

  Site#      Site#      Site#      Site#
1. 002      2. 003      3. 004      4. 005
5.          6.          7.          8.
9.         10.         11.         12.
13.        14.         15.         16.
17.        18.         19.         20.
21.        22.         23.         24.
25.        26.         27.         28.
29.        30.         31.         32.
33.        34.         35.         36.
37.        38.         39.         40.
41.        42.         43.         44.
45.        46.         47.         48.

Next Page? N ...      00 On Next Page

```

Figure 11-60. Roaming COS for Sites 2 - 5 TeamTalk Group

In addition to setting up the roaming COS for a TeamTalk group, a scripted node user is set up. Figure 11-61 illustrates the settings for making a dispatch call to sites 2-5, and Figure 11-62 illustrates the settings for making a dispatch call to all sites. Figure 11-63 illustrates the settings for making a dispatch call to all sites by calling telco number 820-1234.

Section 11. Example Databases

NODE 001	
NODE USERS	
Phone #: [0001111]	
Name: [TEAMTALK SITES 2-5]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: TEAMTALK	
Parms: 2'1111'5	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 11-61. Node User and Run Script Windows for TeamTalk Group (Site 2 - 5)

NODE 001	
NODE USERS	
Phone #: [0001234]	
Name: [TEAMTALK 1-5]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: TEAMTALK	
Parms: 1'1234'5	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 11-62. Node User and Run Script Windows for TeamTalk Group (All Sites)

Section 11. Example Databases

NODE 001	
NODE USERS	
Phone #: [8201234]	
Name: [TEAMTALK TELCO 1234]	
User Type: [S]	Valid: [V]
RUN_SCRIPT	
Please see HELP Window.	
Script Name: IFORWARD	
Parms: 1234	
Message Notification: ...	
Final Destination: N ...	
----- BILLING INFORMATION -----	
Acct No:	Rate Code:
Bill Duplicate: N	Num. Mobiles:
Comment:	
Create Date: 08/16/99	
Alter Date: 08/17/99	

Figure 11-63. Node User and Run Script Windows for TeamTalk Group (All Sites) via Telco

Node Users Printout

0001111 - Phone Number	Name: TEAMTALK SITES 2-5	INVOKES SCRIPT
This Number invokes Script: TEAMTALK		
Parameters: 2'1111'5		
Comment:	Create Date: 08/16/99	Alter Date: 08/17/99
0001234 - Phone Number	Name: TEAMTALK SITES 1-5	INVOKES SCRIPT
This Number invokes Script: TEAMTALK		
Parameters: 1'1234'5		
Comment:	Create Date: 08/16/99	Alter Date: 08/17/99
8201234 - Phone Number	Name: TEAMTALK TELCO 1234	INVOKES SCRIPT
This Number invokes Script: IFORWARD		
Parameters: 1234		
Comment:	Create Date: 08/16/99	Alter Date: 08/17/99

12. GLOSSARY	12-1
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12. GLOSSARY

The glossary provides definitions of some industry-specific terms. Many of the glossary words are defined loosely because they are used in a wide variety of applications. In addition, some of the glossary words can be defined differently if they are used out-of-context. The glossary definitions are meant to be applied only to the text of this and other related Zetron manuals.

- A -

Address	The "location" of a user; usually the ID code.
Alarm	A monitor of specific critical conditions at the site.
Answer-originate	A method of establishing a modem communications link. When the site answers the phone line, the calling modem emits answer tone, which is detected by the site modem.

- B -

Batch	A set of information generated by the radio equipment that is transferred to other equipment at a specified interval. In a FASTNet System, two types of batches are collected; by the radio sites and by the nodes. When a batch timer expires, the data is updated to the connected equipment.
Busy	An already-in-use condition in the mobile or repeater.

- C -

Call Detail	A file that contains billing information for interconnect phone calls processed by the FASTNet Switch. The call detail record includes the phone number of the FASTNet Node user, the time, date, and length of the call, and the status of the call.
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Section 12. Glossary

Call Forwarding	There are three main types of call forwarding: 1) The first is a method of making a "second effort" to complete an incoming call to a FASTNet Node User. When the mobile does not answer the call within a specified time period, the call is rerouted to another phone number, or voice messaging, or a paging terminal, etc. This type is designed to keep the users always in-touch. 2) The second uses a script to always reroute the call to another number. This type can be used to avoid paying toll-call charges. 3) The third uses a script to always reroute the call to another number's voice mailbox. This type enables the user to screen his or her calls.
Caller-Directed Call Routing	This type of call allows the caller to choose how to reroute his or her call. The choices are explained in an announcement recorded by the user. This type of call is implemented by using a script.
Call Networker	A FASTNet option that allows for a multi-site FASTNet system.
Carrier	A physical connection carrying more than one communication channel.
Carrier Operated Relay (COR)	A data input that determines whether the transmission path is already busy.
Cell Number	A cell number (programmed in Ebase) is the ESAS™ Radio Site number.
Central Office (CO)	The telephone company's switch that connects a phone line to the public switched network.
Channel	An electronics communications path (a single repeater). A narrow band of frequencies that a radio system must operate within to avoid interference with other adjacent channels.
Class-of-Service (COS)	A set of operating parameters that define certain users. Fastbase has three unique classes of service; roaming, toll, and general.
Clear to Send (CTS)	A data input that determines when the line is clear (not busy) for transmission of information.
Compandor	A circuit that compresses the dynamic range of an input signal to eliminate noise and interference.
Coverage	The useable radio time and geographic area of a system.

- D -

Data Terminal Ready (DTR)	A data output that determines when the receiving party is set to accept information.
Decoder	A device that receives input data and translates it into a usable format.
Delay	The time difference between initiation of an event and the response.
Dial Click	The audio data produced by a rotary dial telephone. The “clicks” are a result of the phone line loop current being broken and reconnected via a relay. Each digit is a series of one to ten audible clicks.
Dialing Plan	A set of digit strings that Node users are allowed to dial. The dialing plan sets up the correspondence between the number dialed and the best least cost routing.
Dialtone	A phone line condition that indicates to the calling party that the exchange is ready to receive information.
Direct Inward Dial (DID)	A type of phone line (from the C.O.) that transfers the last few digits of the phone number dialed. A DID line allows direct dialing to a PBX network without operator assistance.
Dispatch	The normal method of transmission between radios in the same group. Using a repeater, one radio broadcasts to one or more radios, all with the same LTR ID. Dispatch calls are transmission trunked, meaning that every time a group member keys up another channel may be used.
Dual Tone Multi-Frequency (DTMF)	A touch-tone signaling protocol used in telephone equipment. DTMF uses two voice-band tone signals at the same time.

- E -

E & M	A telephone line type that indicates seizure and supervision on two separate wires. E and M refer to the two data wires - Ear (receive) and Mouth (transmit).
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Section 12. Glossary

Ebase	Zetron's multi-site, multi-channel ESAS LTR user database program. It manages the Model 49 (and Uniden MRS804ZX) user database information and retrieves interconnect billing data and repeater loading information from the site equipment.
End-to-End	A standard telephone line type like that available in a home. Also referred to as a POTS line.
ESAS™	Uniden's Enhanced Sub-Audible Signaling protocol. ESAS provides enhanced networking capabilities, including true automatic roaming, extended radio ID names, up to 8196 unique mobiles per radio site, and enhanced network billing.
Expander	A circuit that expands the dynamic range of an output signal that was companded.

- F -

FASTNet	Zetron's high-speed digital switching network that connects LTR™ systems for wide-area coverage.
FCC	Federal Communications Commission. A Presidentially-appointed board that regulates non-governmental, domestic communications systems.
Follow-Me Roaming	An optional feature that enables FASTNet users to travel to another, networked node and register. Once the user is registered as a roamer at the host node, all of the calls and message beeps (if enabled) are forwarded to the mobile. The net result is the user can enjoy "true" roaming privileges.
Foreign Exchange (FX)	Phone lines from a central office that is not the local central office.
Full-duplex	A mobile radio that can transmit and receive simultaneously. Requires two separate frequencies for data transmission in both directions.

- G -

- Ground Start** A telephone signaling protocol where a ground condition represents seizure of the phone line by the originating equipment.
- Guide Window** A help screen in Fastbase and TCE that provides shortcut key sequences for database operations. Two different guide windows are available; the Data Window Guide and the Index Window Guide. The Guide Windows are accessed by pressing the <F1> key.

- H -

- Half-duplex** A mobile radio that can only perform one-way communications at any given time - transmit or receive.

- I -

- Immediate Start** A telephone signaling protocol that does not require a start indication. The CO sends digits to the terminal immediately after the line is taken offhook.
- Interconnect** A transmission link between trunking repeaters (radio) and standard telco lines. In the Model 49/459, interconnect is a purchased option.
- Interface** A connection between multiple pieces of hardware equipment.

- L -

- Least Cost Routing** A method of directing each call through the FASTNet Switch in the most efficient, cost-effective manner. Least cost routing does a sequential search of the programmed trunks to determine which lines are available and most desirable.
- Loop Start** A telephone signaling protocol that initiates a call upon connection of the tip and ring leads (loop closed).
- LTR™** Logic Trunking Radio. EF Johnson's protocol for mobile trunking radios.

- M -

Maintenance Port	<p>A port on the Model 2540 chassis for PC communications with the FASTNet Switch. The maintenance port can be either a local, serial connection or a remote, modem connection. The maintenance port is needed for updating the database and modifying system operating characteristics.</p> <p>Zetron strongly recommends that a modem maintenance port is available for factory support and troubleshooting.</p>
Message Beeps	<p>Several short beeps issued to the mobile upon key-up to indicate that the user has unretrieved voice message(s) waiting in their mailbox.</p>
Mobile	<p>A hand-held LTR™ radio unit.</p>
Modem	<p>A computer communications device that transmits and receives data over telephone lines for remotely located systems.</p>
Modem Initialization String	<p>A set of commands issued to a modem to define its operating characteristics. The modem initialization string usually consists of standard Hayes "AT" commands. Refer to the modem manual for model-specific commands.</p>
Multibase	<p>Zetron's trademarked database program for managing the Zetron Model 49 Trunking Repeater Manager (and the Uniden MRS804ZX Repeater).</p>
Multi-frequency (MF)	<p>A touch-tone protocol used in telephone equipment. MF is similar to DTMF, but uses different combinations from another tone set.</p>
Multiple-Site Dispatch	<p>A generic term for sending the same broadcast out on multiple sites at the same time. TeamTalk and Network Dispatch are the two ways the FASTNet Switch can achieve multiple-site dispatch.</p>

- N -

Netlink	<p>A Zetron proprietary serial communications program for use with the FASTNet Switch. Netlink is used for transferring files back and forth between the Model 2540 and the office PC and modifying various system parameters.</p>
----------------	--

Netview	An optional on-screen display of FASTNet system traffic. Netview is useful for monitoring system loading and call routing.
Network	A set of communications lines or devices that are connected together to provide greater coverage area and availability.
Network Dispatch	A FASTNet and Model 49 feature (not supported by the Model 459) that allows multiple-site group calls with directly connected and dial-up sites. The radios operate in half-duplex mode. A telephone caller may initiate and participate in a Network Dispatch call.
Node	A single FASTNet Switch. Each node is identified by a unique three-digit number from 0 to 255.

- O -

Outdial Table	A command set that determines how the FASTNet Switch processes the feed digits it receives from a mobile unit. Outdial commands define the type of signaling (pulse, DTMF, or MF) and the outbound dialing sequence (including pauses and dialtone detection).
Overdial	Touch-tone signals sent to the hardware from a modem or telephone keypad. Overdial often indicates that tones are dialed before the prompt is through playing.

- P -

PBX	Private Branch Exchange. A private telephone switch network that connects lines at a single site to the public switched network.
Prompts	A tone or voice message that guides a caller in using the radio system. Prompts tell the user when and what type of action is appropriate.
Pulse Dialing	The signaling of digits 1 to 9 and 0 by breaking (disconnecting) and making (reconnecting) the phone line connection quickly one to ten times. A rotary phone uses this type of dialing.

- R -

Radio Site	Any radio system that is connected (either directly or through a remote media, e.g., microwave) to the FASTNet Switch. Radio Sites can include any equipment from a Zetron Model 49 to a paging terminal.
Range	The usable coverage area of a radio system or transmitter.
Repeater	A radio station that receives a signal on one frequency and immediately rebroadcasts it on another frequency. Repeaters are used to increase the coverage area of a given system.
Request to Send (RTS)	A data output that announces to the receiving party that data is ready for transmission and requests a chance to send it.
RIC	Repeater Interconnect. A radio station that is connected to other radio station(s) through telephone lines to increase the coverage area.
Roaming	<p>Refers to a mobile user traveling outside of their “home” site and accessing another site. There are several different types of roaming. A user can roam between Radio Sites, between Nodes, and between totally separate LTR™ systems.</p> <p>Network Roaming should not be confused with the traditional industry term “roamer”; they are <i>not</i> the same. A “roamer,” as traditionally defined in the mobile telephone industry, is a user from a foreign (out-of-town) system who desires temporary authorization to use the local interconnect system. This type of roamer is merely another “node user” to FASTNet.</p>
Routing	The data path through which calls or information are passed. In an LTR system, routing is the sequence in which a call is trunked between repeaters.

- S -

Script	A specialized user type that defines the communication between the FASTNet Switch, the Radio Site, and the CO. The Model 2540 is shipped from the factory with several predefined scripts.
Site	The radio equipment at a single location. The site may consist of a single repeater or an entire bank of repeaters with connected accessories.

SMDR	Specialized Mobile Detail Record. A billing record for LTR calls. The file contains specific information about each call made on a system.
SMR	Specialized Mobile Radio. A group of several different types of two-way radio communications. See also LTR™ .
Supervision	When a switching network monitors the status of a line for the duration of a call.
Switch	A telephone device that connects multiple inputs and outputs. The switch controls the routing and organization of the data transmission paths.
System Configuration Files	Several customized ASCII files stored in the Model 2540 that define the operating characteristics of the trunk groups, nodes, and trunk cards. System configuration files are easily modified using the TCE program.

- T -

TCBase	Zetron's multi-site, multi-channel LTR user database program. It manages the Model 459 user database information and retrieves interconnect billing data and repeater loading information from the site equipment.
TeamTalk Dispatch	A FASTNet and Model 49/459 feature that allows faster multiple-site dispatch between directly connected sites than that provided by Network Dispatch.
Touch-tone	AT&T's registered trademark name for push-button dialing. See DTMF .
Traffic	The frequency, volume, and duration of calls on a radio system.
Transmission	Broadcast of communications data over a specific frequency range.
Trunk Card Editor (TCE)	A user-friendly database program used for modifying the operating characteristics of the FASTNet Switch trunk cards.
Trunking	The process of rerouting calls between repeaters in an LTR system.

- W -

Wide Area Dispatch	Another term for network dispatch and TeamTalk.
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Section 12. Glossary

Wink Start A telephone signaling protocol where the initiating offhook from equipment A is acknowledged with a brief offhook and onhook from equipment B. Equipment A waits for the response from equipment B before proceeding to signal digits.