AM2-D/De

Digital Bulk Call Generator
Instruction Manual

Ameritec

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Record of Revisions

01	December 14, 2000	Combined AM2-D and AM2-De manuals. Engineering review copy.
A	January 10, 2001	Incorporated Engineering review comments. Initial Release.
B	March 21, 2001	Added Call Program increment changes to Section 2 and Section 4 as per Host 5.0.
C	August 2, 2001	Revised Section 2 FeatureCall Getting Started per new FeatureCall program. Changed FTP site references to web site references.

This manual was produced on a Power Macintosh using MS Word 6.0 and Adobe Illustrator 6.0.

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1. INTRODUCTION

The AM2-D/De is a member of the Ameritec Niagara® family of bulk call generators. The Niagara family units have push-buttons to use in controlling a front panel display, and may also be operated by sending control commands across an RS-232/Ethernet port.

Ameritec offers a Microsoft Windows-based Graphical User Interface (GUI) called FeatureCall®. FeatureCall is a convenient way to program and control any of Ameritec's Bulk Call Generators.

The AM2-D/De Bulk Call Generator generates and receives large volumes of telephone traffic, generally for load and regression testing of telephone switching systems, and is designed for use on up to four PCM lines of a Central Office Exchange or PABX.

Introductory paragraphs 1.1, and 1.3 through 1.6, describe concepts involved in Bulk Call Testing using the Ameritec Niagara Bulk Call Generators. Introductory topics include describing the functions of Scripts, Call Programs, Call Test Sets, and Protocols.

1.1 Bulk Call Testing

Bulk call testing is a method of stress testing a switch or exchange. Generally such testing is used to generate high volumes of telephone traffic while exercising many features of the switch in a 'pre-service' of 'out-of-service' environment. The purpose of the high volume is to test the ability of the switch to perform its many functions under a heavy load. Stress testing may uncover an array of problems that might not show up under light traffic or single feature test conditions, such as software bugs, misrouted calls, broken connections, incorrect setup messaging, and others, up to and including total switch failure.

The easiest way to stress test a switch is to connect it to a bulk call generator. Once connected, it may be programmed to generate a large volume of calls and to exercise many switch features. For most applications, an Ameritec bulk call generator tests switches by simulating the terminal equipment that would normally be connected to the switch when it is placed in service.

1.2 AM2-D Functional Description

The AM2-D originates and/or terminates calls on up to 96 channels based on the directions it receives from a Call Test Set. Each AM2-D can store up to four Call Test Sets.

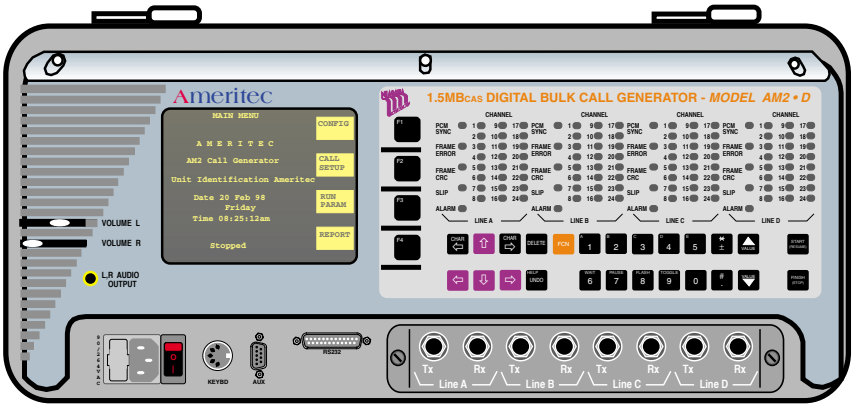


Figure 1-1. AM2-D

1.3 AM2-De Functional Description

The AM2-De originates and/or terminates calls on up to 120 channels or four E1 lines based on the directions it receives from a Call Test Set. Each AM2-De can store up to four Call Test Sets. Test results are displayed in Call Statistics reports.

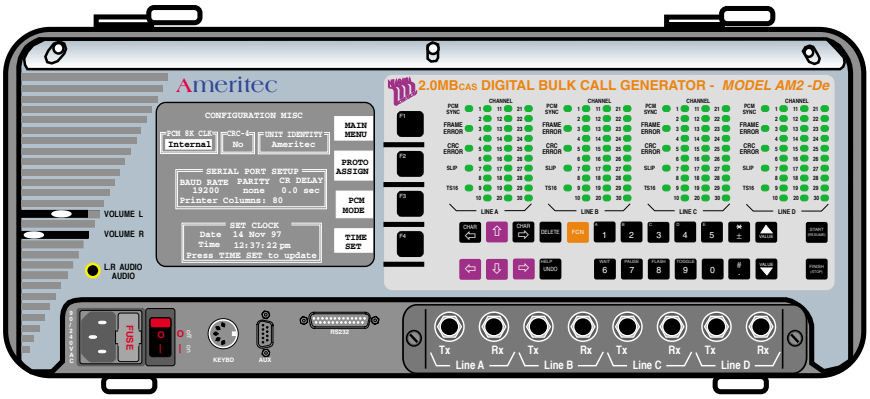


Figure 1-2. AM2-De

The AM2-D/De Call Statistics Report is user programmable and tracks items such as originating attempts and completions, terminating attempts and completions, and confirmations.

The descriptions in this subsection are based on Figure 1-3. Figure 1-3 is a simplified functional block diagram of the AM2-D/De and includes the I/O Ports. Only items that are relevant to understanding the operation of the unit are shown. The block diagram does not reflect the actual internal hardware layout.

The AM2-D/De portion of Figure 1-3 is divided into white and gray modules. The white modules with black text are the test modules that execute or translate the Call Program instructions by generating and terminating calls and measuring/ tracking the results. The dark gray modules with white text are front panel components related to the User Interface and chaining options.

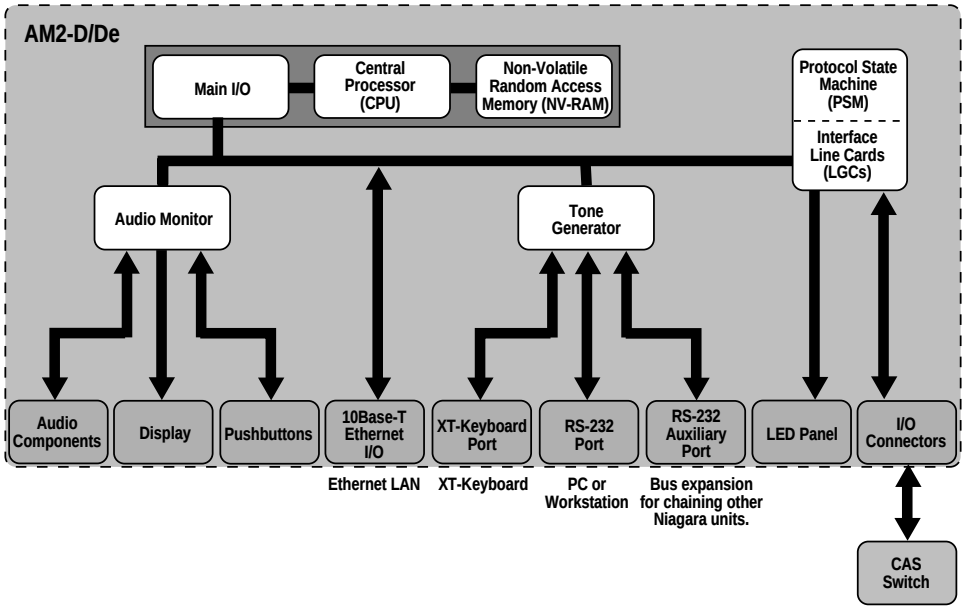


Figure 1-3. AM2-D/De Functional Block Diagram

Test Modules

The AM2-D/De Test Modules include the CPU, Main I/O, NV-RAM, Line Cards, Tone Generator, Audio Monitor, Audio Components, EL Display, Pushbuttons, LED panel, and I/O Ports.

- The CPU contains a high-speed microprocessor, ROM, RAM, decoders, buffers, and interrupt handlers to manage overall operation of the unit. In conjunction with the Main I/O card, the CPU controls the I/O interfaces.
- The NV-RAM stores the Protocols, Scripts, and Call Program files that the CPU and Protocol State Machine (PSM) use to execute test sequences. It also maintains these files when you remove power from the unit.
- The PSM is located in the Line Card logic. In accordance with the rules defined in a Protocol State Table (PST), the PSM responds to stimuli from the Call Programs (events) by outputting specified signal(s). PSM and Call Program activity allows the Line Interface Card to generate and react to inputs from the Line Card in the Switch Under Test. There is a separate PSM for each line
- The Line Cards also contain the LED interface. Under program and CPU control, specific front panel LEDs light when activity on those lines exist.
- The Tone Generator generates audio range tones to test the voice band capabilities of the voice path and inband applications. The Tone Generator also contains the RS-232 receiver, and driver chips for the RS-232 and Auxiliary ports as well as the XT-keyboard interface. The Ethernet Interface, on the other hand, interfaces directly with the Main I/O board via the backplane.
- The front panel contains audio components, pushbuttons, and an Electroluminous (EL) display that allows you to interact with the unit. The audio monitor board, under CPU control, interacts with the audio components, pushbuttons, and display. The display control and drive circuitry (not shown) mounts on the rear of the display. The audio components include a speaker, phone jack, and volume control.
- The Main I/O and CPU control the Ethernet Interface.

Test Interface I/O Modules

The AM2-D/De CPU routes Call Program instructions to the proper line cards. The line cards, in turn, convert Call Program instructions to the appropriate digital signaling format. They also translate incoming instructions from the digital Line Cards to a format that can be processed by the CPU and PSM.

The AM2-D connects to the switch mode tests via 4 2-pair bantam connectors. Section 1.9.7.4 provides information on other interface test port options available for the AM2-D.

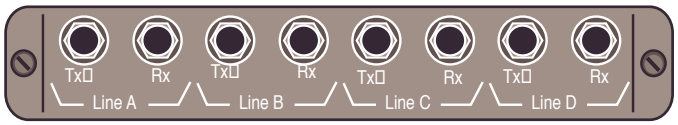


Figure 1-4. AM2-D PCM Line Connectors

The AM2-De connects to the unit under test via four BNC connectors (standard). Figure 1-23 through 1-27 show optional physical interface modules.

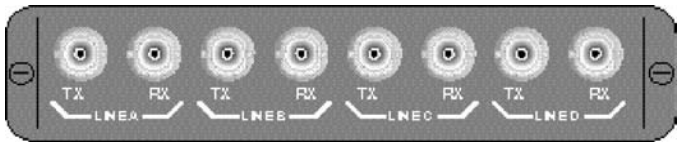


Figure 1-5. AM2-De BNC PCM Connectors

User Interface and Chaining I/O Modules

The Niagara has five significant I/O modules: an RS-232 Main I/O Port, an Auxiliary RS-232 Port, an Ethernet Port, a PC-XT keyboard jack and the line interfaces.

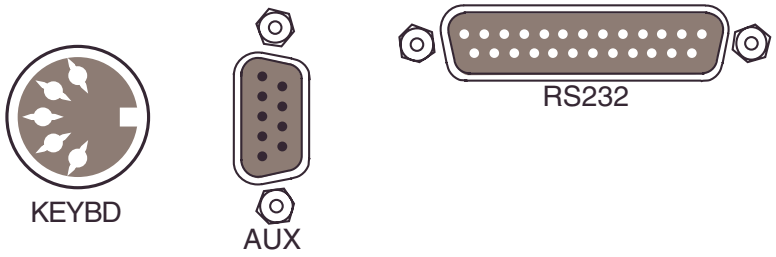


Figure 1-6. Interface Modules

- The RS-232 Main I/O Port (**RS232**) allows control of the AM2-D/De from a PC or RS-232 compatible terminal operating at a baud rate of 19.2K. This port may be used to download or backup unit Scripts and Protocols or for printing reports. It is also used as a control point for integration into a test system. Refer to paragraph 1.9.7.1 for details related to the RS-232 port. Figures 1-16 through 1-18 contain information about optional RS-232 cables available from Ameritec.

- The Auxiliary I/O Port (**AUX**) allows chaining of additional Niagara, Squirt, and Crescendo products to the AM2-D/De. Refer to Figure 1-22 to assist in configuring the RS-232 Port for chaining.
- The Ethernet Port (**RS232**) requires an Ethernet cable and adapter (Figures 1-19 and 1-21), and allows set up of a Local Area Network. You may use this port to download or backup Scripts and Protocols or for printing reports. It is also used as a control point for integration into a test system. Refer to ¶1.9.7.1 and 1.9.7.2 for details related to the Ethernet port.
- The **KEYBD** Jack allows you to simulate front panel keys by connecting an XT type keyboard. Section 6 presents the XT to AM2 key mapping
- The line interfaces (shown in Figures 1-4 and 1-5) are connectors that contain support for 24 channels (AM2-D) or 30 channels (AM2-De).

1.4 Scripts, Call Programs, Call Test Sets, and Protocols

To understand how to use an AM2-D/De unit, you need to understand four concepts: Protocols, Scripts, Call Programs, and Call Test Sets.

- A **Protocol** defines how the Niagara communications channels will respond to stimuli (Events). Each Protocol consists of a Protocol State Table (PST). The PST contains the rules of engagement between the Call Program, the Niagara Protocol State Machine (PSM), and the Digital Line Interface. The rules of engagement define the signal(s) that the PSM will send in response to specific events. Your unit is shipped with one or more Protocols installed.
- A **Script** is a text file with specialized syntax that forms the template for the unit to follow when it originates or terminates a call. Your unit is shipped with one or more Script files installed.
- A **Call Program** is a program that assigns user and default parameters, such as call channels and phone numbers, to a selected Script.

- A **Call Test Set** is a collection of Call Programs executed as a test during run mode. Each Call Program is based on one Script, and a Call Test Set may contain many Call Programs. Call Programs within each Set may be individually enabled or disabled without removing them from the Set.

1.5 Communicating with the AM2-D/De

You may interact with an AM2-D/De via the front panel, a PC-XT keyboard connected to the front panel, or by sending control commands to the RS-232 or Ethernet port.

Front Panel Interface

The front panel interface consists of an electro-luminescent display, push-buttons for control, an LED line display, and the actual interface connectors. Detailed functional descriptions and related graphics are provided in paragraph 1.9. Section 2, Getting Started, provides detailed step-by-step procedures related to setting up the unit for testing, designing call statistics reports, initiating testing, and interpreting test results.

PC-XT Keyboard Interface

Connecting a PC-XT keyboard to the front panel allows you to perform line editing on Scripts, enter all alpha-numeric characters, and emulate Front Panel push-button functions. The PC-XT Keyboard interface is covered in Section 6.

Control Command Interface

The command control interface allows you to:

1. connect the RS-232 Port to an Ethernet workstation using a 10Base-T adapter.
2. connect the RS-232 Port directly to a Personal Computer (PC) or to a workstation using a serial cable.
3. connect the RS-232 Port to a modem communicating with a PC or workstation.
4. connect the RS-232 port to the Auxiliary port of another Niagara that is connected via method two or three above.

You may also send control commands. Control commands fall into ten major categories and are usually one or two characters plus any applicable parameters. Section 5 lists each of the commands alphabetically. Command categories are listed below:

- Help Commands
- Chaining Commands
- Configuration Commands
- FeatureCall Commands
- File Operation Commands
- Miscellaneous Commands
- Ethernet Commands
- Program Operation Commands
- Report Commands
- Test Control Commands

Procedures for using these commands are covered in Sections 2 and 3. After you familiarize yourself with the commands, you can refer to the alphabetized command reference in Section 5.

FeatureCall® Graphical User Interface

The Ameritec Corp. (P/N 240034) FeatureCall® is a Microsoft® Windows® based application that runs on a personal computer with a 486 or higher microprocessor. This PC-based Graphical User Interface (GUI) provides a simplified human interface to control Ameritec Call Generators in either a system test environment, or as the control of a single test instrument.

A test environment can be created over an Ethernet® TCP/IP LAN or an RS-232 serial network. FeatureCall allows you to configure units, transfer files, control test sequences, request data, and generate reports.

1.6 Inspection

The AM2-D/De was thoroughly tested and carefully packed before shipment. Before operating the unit, visually inspect the unit for damage. If the unit looks fine, but you suspect rough handling because of the condition of the shipping container, remove the front panel and check for loose circuit boards before applying power. A screw on each side of the front panel vents secures the panel to the chassis. To remove the front panel, unscrew the two screws and gently lift out the panel. Be careful not to disconnect any internal cabling. Check that the circuit boards are seated, then reinstall the front panel.

Immediately contact the carrier in the event of physical damage to the unit. The carrier's name is printed on the packing slip. Notify Ameritec in the event of a shortage or malfunction. Save the container and packing material in case you need to return the unit.

1.7 Initial Test Setup

Most of your interaction with the AM2-D/De will be during your first test setup phase. During the first test setup, you will be:

- connecting the unit to the lines to be tested.
- creating Call Programs. You create a Call Program by assigning a Script to a Call Program number and then assigning parameter values to that Call Program. Values are items that make that Call Program unique and include things such as channel numbers, call digits, and delay times.
- assigning the Call Programs to a Call Test Set.
- assigning specific Protocols to each line pair.

Note: Appendix A contains a listing of the Call Statistic Data Register Codes and Real-Time, System, and Unit error messages pertaining to the Scripts that shipped with your unit.

Note: Once you have created Call Test Sets and assigned Protocols to each line pair, future setups can be as easy as enabling or disabling individual Call Programs within a Set.

1.8 Using the Manual

Sections 2 through 6 provide detailed operating instructions and/or related reference material. The following list provides a summary of each section:

- **Section 2, Getting Started**, contains the detailed instructions for setting up the unit for the first time. Later on, if you need a refresher, you can refer to *Section 4, Screen Reference*.

- **Section 3, Command Port Setup and File Management**, contains instructions for setting up the RS-232 and Ethernet ports as well as instructions for transferring files between the unit and the Terminal or Terminal Emulator on the PC/Workstation.
- **Section 4, Screen Reference**, presents the screens/menu in Function Key order and provides details on using each screen, menu, or dialog box. Each topic is complete. References to other sections and/or material are minimized.
- **Section 5, Command Reference**, provides an alphabetical listing of Control commands, accompanying syntax, and, where needed, a detailed description for complex commands.
- **Section 6, Front Panel Keyboard Equivalents**, contains a listing of the XT Keyboard commands that perform the equivalent front panel functions.

As you become a more advanced user, you may want to create your own Scripts. Detailed instructions for Script writing can be found in the Ameritec Call Generator Script Writer's Guide (Ameritec P/N 18-0134).

You may even have the opportunity to create new or modified Protocol State Tables (PST). Instructions for creating PSTs are contained in the AM2 Bulk Call Generator Protocol Table Development Guide (Ameritec P/N 18-0038).

1.9 Physical Description

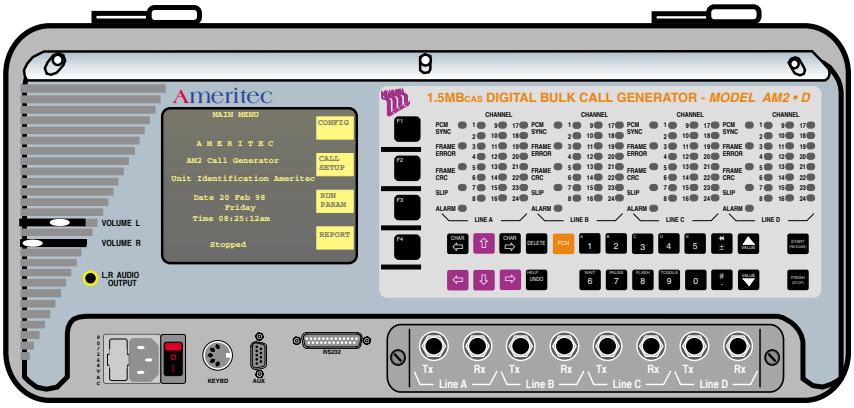


Figure 1-7. AM2-D

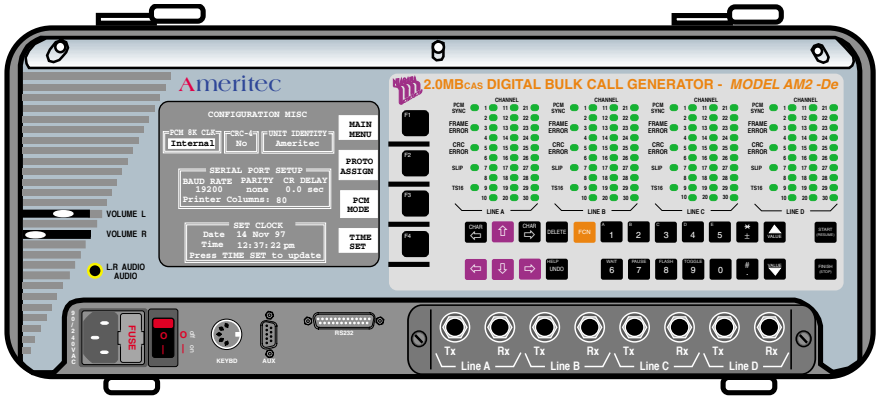


Figure 1-8. AM2-De

The AM2-D/De is 16.8 inches wide, 7.2 inches deep, 11.5 inches high, and weighs approximately 16.5 lbs (7.5 kg) depending on the option(s) ordered. The chassis shell with attached cover and handle serves as a convenient carrying case.

The video display, LED panel, and push-buttons mount on the rear of the front panel. The front panel is secured to the chassis with five recessed Philips screws and can be removed to access the power supply and line cards.

Although they appear on the front of the unit, the communications ports are mounted on the lower-left front of the chassis. The line interface module is a separate module that plugs into the lower-right side of the chassis front. The face of the unit consists of the following interface groupings:

- video display
- audio group
- line status indicators
- pushbutton group
- input power group
- communication ports
- line interface module

1.9.1 Video Display - Screen Overview

The video display is an electro-luminescent, amber-on-black, 40 x 16 character, constant contrast/brightness Liquid Crystal Display (LCD). To protect the LCD, the AM2-D/De enters screen saver mode when no front panel activity is detected for two minutes. In screen saver mode, the unit displays a bouncing Niagara logo. Press any key to display the previous screen/menu.

The Video Display interacts with you by displaying a variety of Screens, Menus, Dialog Boxes, and Message Only Windows in response to pushbutton commands that you enter from the front panel.

Screens

Screens are full size displays that present information only. The only choice other than viewing is to exit. Examples of screens are: INITIALIZATION SCREEN, REAL-TIME ERROR DISPLAY, and STATISTICS DISPLAY SCREEN.

Menus

Menus are full size displays that allow you to:

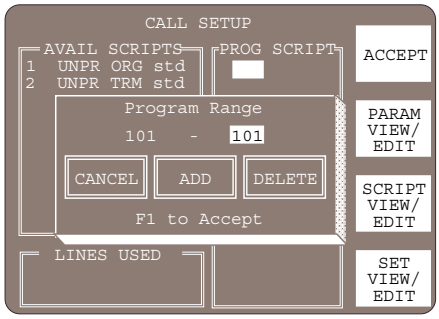
- highlight fields, add, change or delete values.
- select other menus/screens other than the calling screen.

Two examples of menus are the CONFIGURATION MISC menu and the CALL SETUP menu.

Dialog Boxes

Dialog boxes are interactive windows that overlay an existing screen in response to specific key entries. Dialog boxes prompt you to make a specific set of entries before continuing.

The example on the right shows the Program Range Dialog box overlapping the CALL SETUP menu.



Message Only Windows

Message Only windows also overlay an existing screen or menu. The CPU generates Message Only windows to inform you about the status of the unit. Message Only windows fall into two categories:

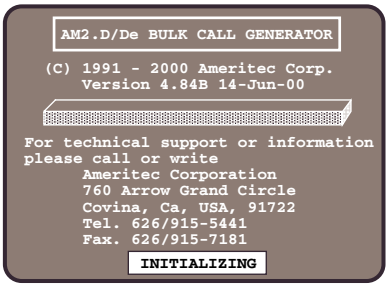
1. Windows that you need to clear. These windows indicate some action is required on your part to achieve the desired result. Clearing the windows acknowledges that you received the message. 'Conflicting Channel' and 'No Such Program' are examples of messages that need to be cleared. Press any key except **FCN**, **START**, or **FINISH** to clear.
2. Windows that the CPU displays while a specific activity is taking place. The 'Working' and 'Copying to' message windows are examples of windows that need not be cleared.

> **Note:** The unit displays Working when the CPU is busy processing a previous instruction. You may, however, enter keystrokes while the message is displayed. Keypad buffers store up to ten characters while 'Working' is displayed. If you enter more then ten characters, unwanted results may occur. To cancel buffered characters and stop any test in progress, press **FCN** followed by **FINISH**.

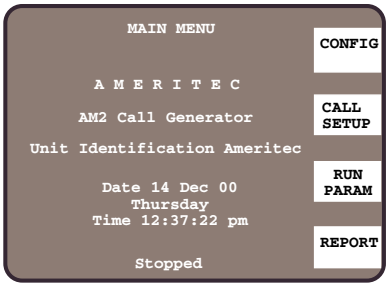
1.9.1.1 Screen Summary

The LCD under CPU control displays various menus and screens. The CPU directs the LCD to display the following menus/screens in response to pressing the key or key combinations shown, starting at the Main Menu. The screens are listed in function key order starting with the Main Menu.

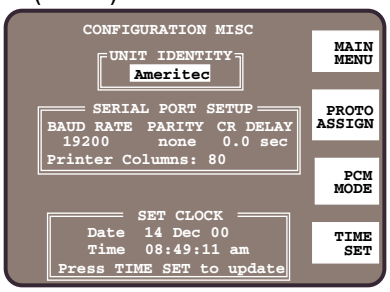
Power On



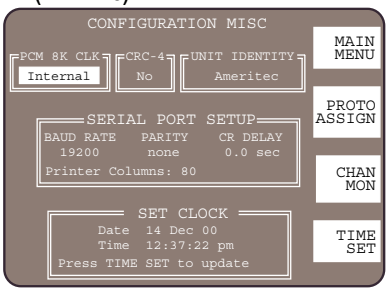
F1 one or more times



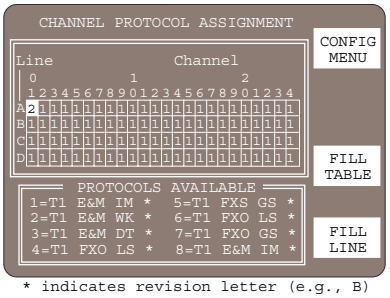
F1 (AM2-D)



F1 (AM2-De)

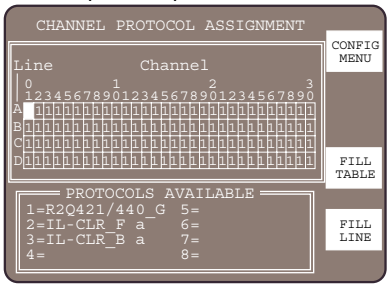


F1 > F2 (AM2-D)

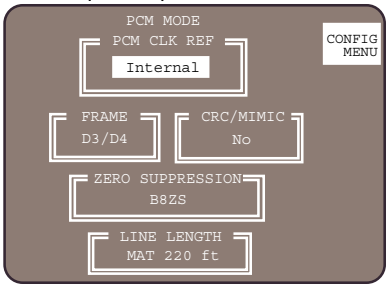


* indicates revision letter (e.g., B)

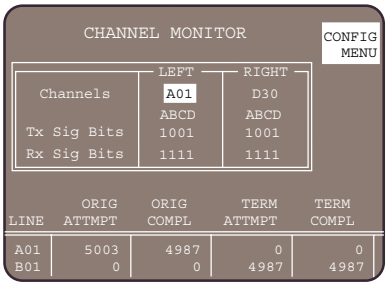
F1 > F2 (AM2-De)



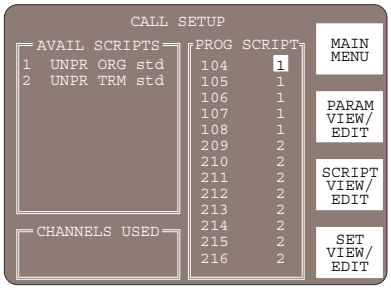
F1 > F3 (AM2-D)



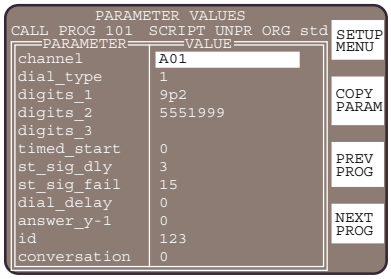
F1 > F3 (AM2-De)



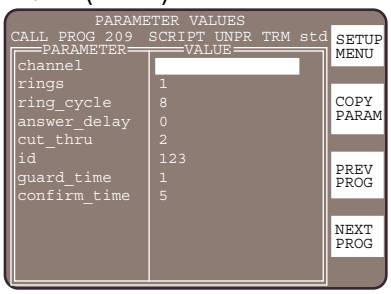
F2



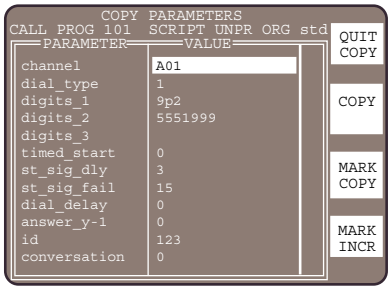
F2 > F2



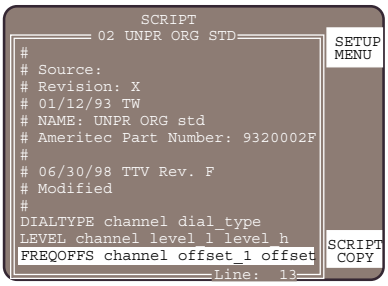
F2 > F2 (AM2-D)



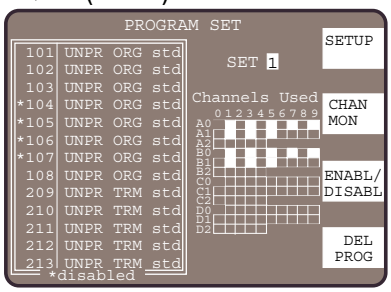
F2 > F2 > F2



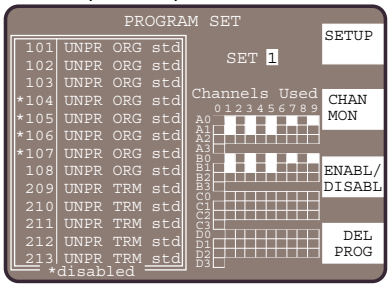
F2 > F3



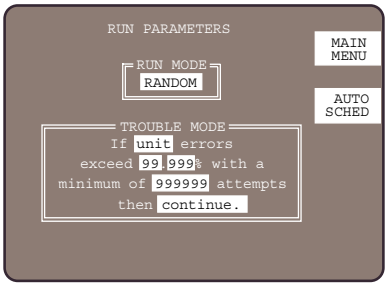
F2 > F4 (AM2-D)



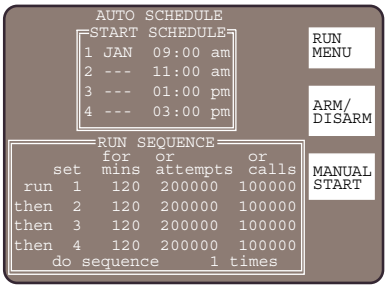
F2 > F4 (AM2-De)



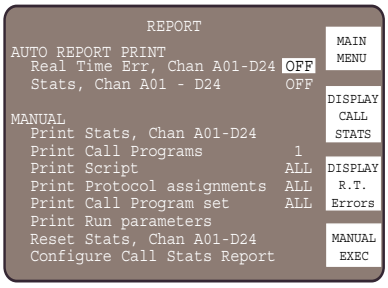
F3



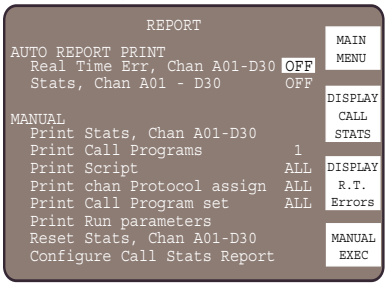
F3 > F2



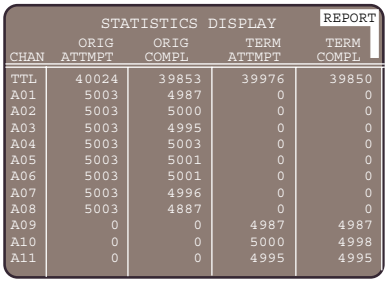
F4 (AM2-D)



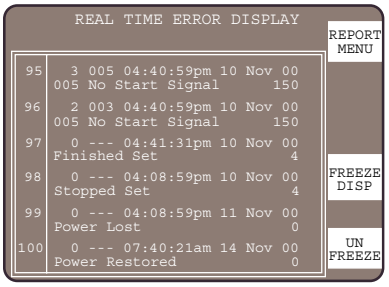
F4 (AM2-De)



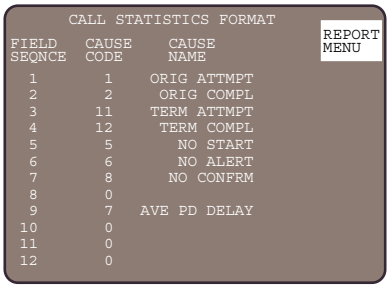
F4 > F2



F4 > F3



F4 > ⇧ > F4



The following lists each screen alphabetically followed by the function keys used to access that screen:

AUTO SCHEDULE menu F3 F2

CALL SETUP menu F2

CALL STATISTICS FORMAT menu F4 ⇧ F4

CHANNEL MONITOR (AM2-De) F1 F3 or FCN F1

CHANNEL PROTOCOL ASSIGNMENT menu F1 F2

CONFIGURATION MISC menu F1

COPY PARAMETERS menu F2 F2 F2

INITIALIZATION screen

MAIN MENU	F1 one or more times	REPORT menu	F4
PARAMETER VALUES menu	F2 F2	RUN PARAMETERS menu	F3
PROGRAM SET menu	F2 F4	SCRIPT VIEW/EDIT menu	F2 F3
REAL TIME ERROR DISPLAY screen	F4 F3	STATISTICS DISPLAY screen	F4 F2

The AM2-D/De contains on-line help for most screens, interactive message windows (dialog boxes), and message only windows. Step-by-step procedures for operating the unit are provided in Section 2, Getting Started. For easy reference, or as a refresher, Section 4, Screen Reference contains a listing of each screen/menu in Function Key order with detailed descriptions/instructions.

1.9.2 Audio

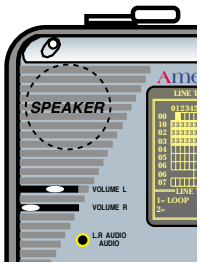


Figure 1-9. Audio Components

The audio components consist of a speaker, phone jack, and volume controls. The AM2-D/De allows you to monitor the audio output of the left and right channel numbers displayed/selected in the CHANNEL MONITOR menu.

The slide controls allow you to simultaneously listen to both channels or to selectively mute out one of the channels.

The phone jack allows you to monitor channels using a headset. When a phone jack is plugged in, the speaker will not operate.

Note: The audio jack is no longer available for CE units as of 1997.

1.9.3 Voice Replay Option (25-0306)

The Voice Replay Option consists of one or two Voice Replay boards (P/N 280183AY), installed in card slots 1 and 2, respectively. The boards hold Digital Signal Processors (DSPs) and EPROM memory that contain pre-recorded voice samples. Each board provides 64 channels of Voice Replay capability. The unit requires two boards to provide Voice Replay for the full complement of channels.

Each voice channel may be assigned to any PCM channel when needed, and released when done. The assignment and release of voice channels, as well as the selection of up to 64 two-second voice phrases, is controlled by Call Programs.

A Creative Labs Soundblaster™, or equivalent, 16-bit audio card, an EPROM programmer, and a PC running DOS 3.x or higher is required to record messages.

1.9.4 Line Status Indicators

The LED Panel, located on the upper half of the front panel, displays the line channel activity. Figure 1-10, AM2-D LED Panel, shows the LED for each of the 96 line channels. Each line has 24 channels.

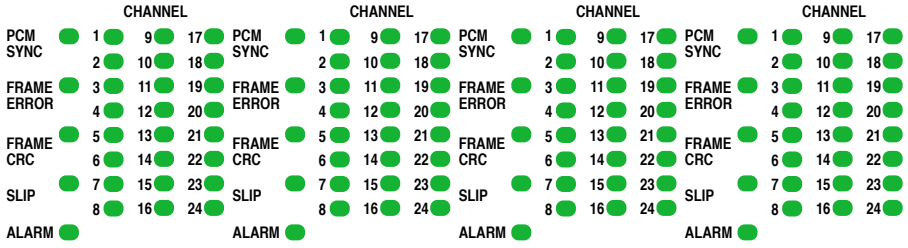


Figure 1-10. AM2-D LED Panel

Figure 1-11, AM2-De LED Panel, shows the LED for each of the 120 channels. Each line number corresponds to a span number.

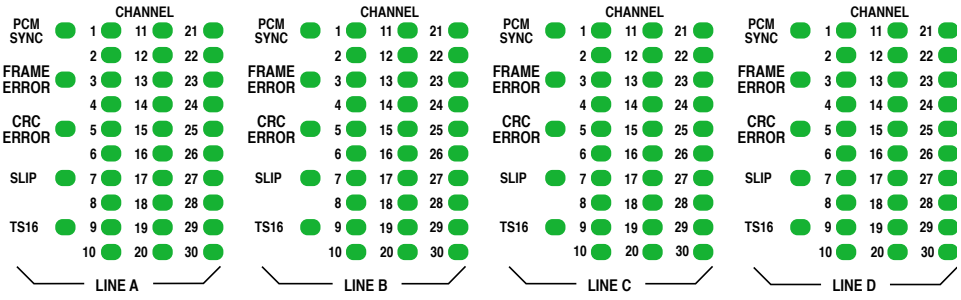


Figure 1-11. AM2-De LED Panel

The channel LEDs can be in one of four states. Table 1-1 shows each state based on the LED color or lack thereof (dark).

Table 1-1. Line LED Status

Color	Status
Dark (off)	Line is Idle (On Hook)
Green	Originate Off Hook (outgoing call)
Yellow	Terminate Off Hook (incoming call)
Red	Not used for factory standard loop or ground start protocols

1.9.5 Pushbuttons

There are three ways to control the AM2-D/De:

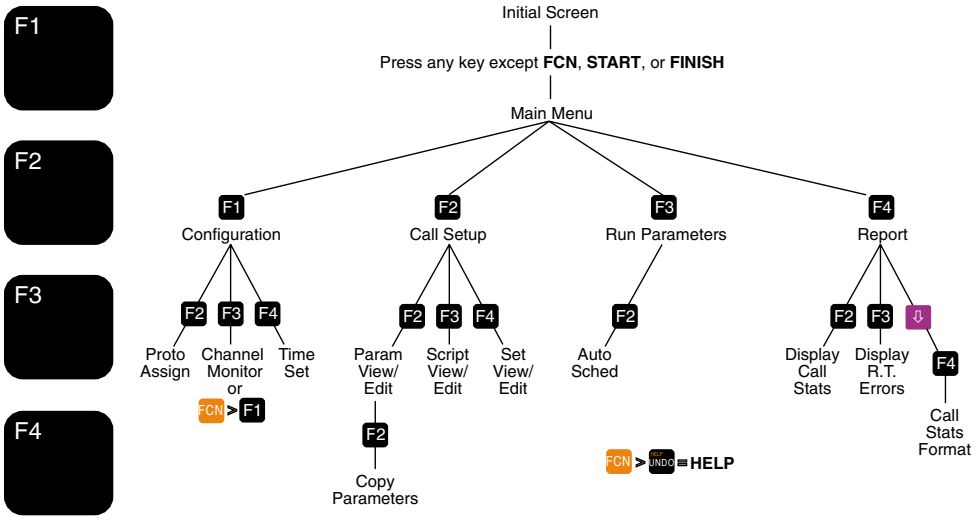
1. By sending commands to the RS-232 or Ethernet Ports. This can be accomplished by sending individual commands or using the Microsoft Windows-based FeatureCall GUI to send the commands.
2. By connecting a PC-XT keyboard to the front panel and sending the equivalent front panel commands.
3. By pressing pushbuttons on the front panel.

Front panel pushbuttons fall into eight categories:

- Soft Function Keys (**F1** - **F4**)
- Test Control Function Keys (**FCN>START** and **FCN>FINISH**)
- Field Control and Character Keys (⇧, ⇩, ⇦, ⇨, **FCN>**⇧ or ⇩, **FCN>**⇦ or ⇨, **CHAR**⇦, **CHAR**⇨, and **DELETE**)
- Value Keys (**VALUE** ⇧ or **VALUE** ⇩)
- Numeric Entry Keys (**0** - **9**, **±**, and **.**)
- Special Function Telephone Keys (**FCN> 1**-**7** or **9**, **±**, or **.** which equals **A**, **B**, **C**, **D**, **E**, **WAIT**, **PAUSE**, **TOGGLE**, *****, **#**, or **.** .
- Range Access Keys (**FCN>VALUE** or **FCN>DELETE**)
- Help Keys (**FCN>UNDO** which equals **HELP**)

1.9.5.1 Soft Function Keys

The soft function keys, located to the right of the LCD, are used primarily to access the various screens and menus. They are referred to as soft, because their functions change depending on the currently displayed screen/menu.



Note: Press **F1** from any screen/menu one or more times to access MAIN MENU. Press **FCN>F1** from any screen/menu to access CHANNEL MONITOR.

1.9.5.2 Test Control Function Keys

To start a test, press **FCN>START** when the **START/FINISH** LEDs are in one of the following three conditions:

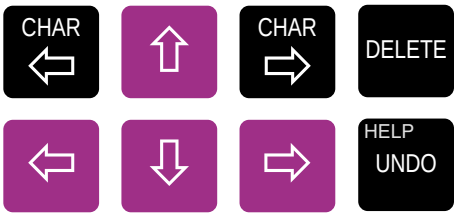
FCN + START (RESUME)

- Starts a new set when unit is stopped (**FINISH** LED solid Red).
- Resumes a halted test (**FINISH** LED flashing red).
- Resumes a test when the unit stopped on error (**START** and **FINISH** LED alternately flashing).

FCN + FINISH (STOP)

- Press **FCN>FINISH** once to halt a test (**FINISH** LED flashes red).
- Press **FCN>FINISH** twice to stop a test (**FINISH** LED solid red).

1.9.5.3 Field Control and Character Keys



Use the **FIELD CONTROL** keys to select a field within a menu or dialog box.

Use the **CHAR** keys to move the cursor to a position within a field.

Press **DELETE** to delete the character at the cursor position. Any characters to the right of the deleted character will shift one position to the left.

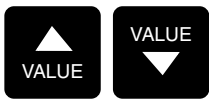
> **Note:** In some fields, when you insert characters the program pushes existing characters to the right, and sometimes out of view. To avoid this situation, delete unwanted characters before entering new ones.

Press **UNDO** to return a highlighted field to the value listed before you started making changes. **UNDO** does not apply to pre-assigned field values, such as the automatic statistics print values: (OFF, 1/4 hr, 1/2 hr, 1 hr) or conditional values such as the trouble mode field (unit, call).

Allows you to scroll through one page of data at a time, down (**FCN** ⇩) or up (**FCN**⇧), within selected windows in the CALL SETUP menu, PARAMETERS menu, SCRIPT menu, PROGRAM SET menu, STATISTICS DISPLAY screen, and REAL TIME ERROR DISPLAY screen.

Allows you to scroll to bottom (⇨), or top of list (⇦), within selected windows in the CALL SETUP menu, PARAMETERS menu, SCRIPT menu, and PROGRAM SET menus. You can also scroll left or right four columns at a time in the STATISTICS DISPLAY screen.

1.9.5.4 Value Keys

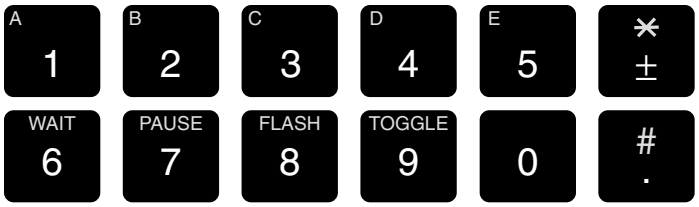


Value keys may be used in one of two ways, to:

1. increment or decrement a preset value or condition.
2. increment or decrement a number, within a range of values, by one.

Note: When a field value or condition is at the extreme of its range, only one **VALUE** key will cause the field to change values. If the highlighted field does not respond to a **VALUE** key entry, then press the other **VALUE** key.

1.9.5.5 Numeric Entry Keys

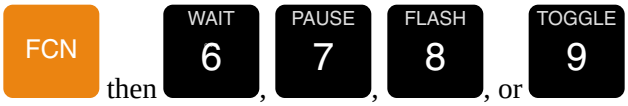


Press a numeric entry key within a highlight field to enter digits **0-9**, **±**, or a decimal point.

1.9.5.6 Special Function Telephone Keys

then one of the following:

You may enter these values in the digits parameter value field to generate the special key functions A, B, C, D, E, *, or #. You may also use these keys to generate alpha characters A through E in fields such as the Unit ID.



Press **FCN** followed by **6**, **7**, or **9** to enter the respective characters 'w', 'p', or 't' in parameter values where w = wait, p = pause, t = toggle.

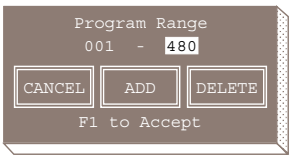
You may also use these keys to generate the alpha characters 'w', 'p', 'f', or 't' in the Unit ID field.

1.9.5.7 Range Access Keys

FCN + VALUE ▲

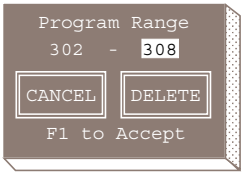
FCN + VALUE ▼

Press from the CALL SETUP menu to add or delete a script to or from a range of Call Programs. Press from the PROGRAM SET menu to add or remove a Call Program range to/from a set.



FCN + DELETE

Press from the CALL SETUP menu to delete a range of Call Programs. Press from the PROGRAM SET menu to remove a Call Program range from a set.



Press from SCRIPT menu to delete a Script.

1.9.5.8 Help Key

FCN + HELP UNDO

Press to access HELP screen(s) for currently displayed screen. If a screen does not have a related HELP screen, nothing happens when you press **FCN>UNDO**.

1.9.6 Input Power

The AM2-D/De operates on universal power: 90 VAC to 264 VAC @ 50 Hz to 60 Hz and fused with a 250V 2A fast-blow fuse. The input power group consists of a three-prong modular AC input connector, a fuse holder, and an on/off toggle switch. The fuse holder and connector are a single unit. An active and a spare fuse are located in a drawer to the right of the AC input connector.

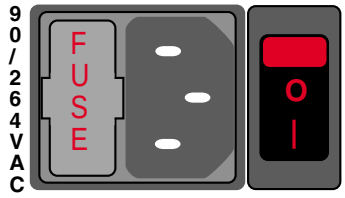


Figure 1-12. Input Power Group

To access the fuses, grip the small tabs in the center of the fuse holder and pull the drawer towards you. Two fuse compartments will be visible. The spare fuse is in the compartment nearest you.

CAUTION: For continuous protection against risk of fire, replace fuse with same type and rating only.

An AM2-D/De power supply converts the universal AC input into +5V, -5V, +12V, and -12V for use by the plug-in modules, fan, LEDs, and LCD.

Grounding

The center pin of the three-prong connector is ground (when connected to a wall socket - earth ground). If your switch is not connected to an earth ground, then make sure that the AM2-De and the switch share a common ground.

CAUTION: To prevent an electrical shock hazard, the power cord protective grounding must be connected to ground.

1.9.6.1 Chassis Grounding Kit Option Installation

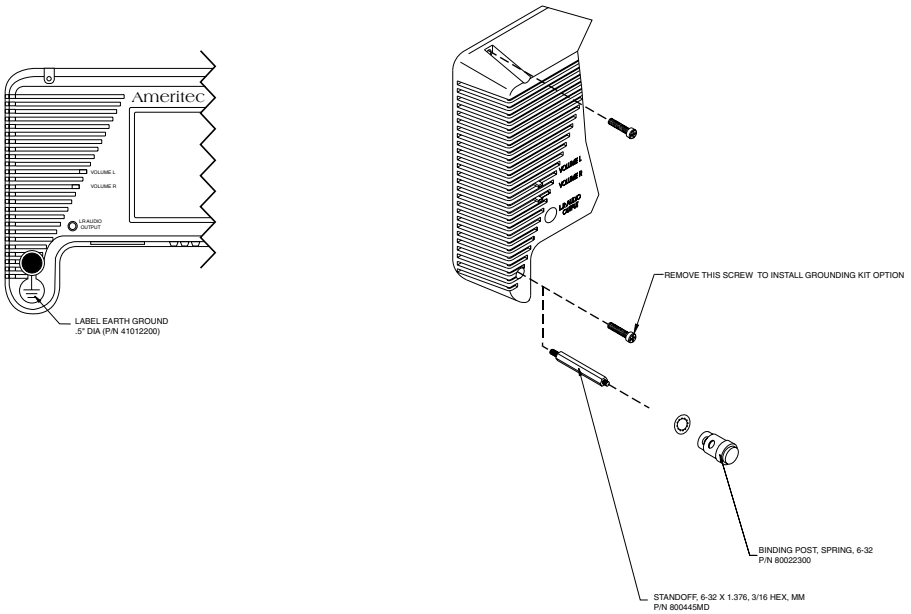


Figure 1-13. Chassis Grounding

1. Remove 1 screw (P/N 80028100) from the front panel of the AM2 assembly as indicated.
2. Insert the Standoff (P/N 800445MD) into the Front Panel as shown. Tighten the Standoff to it's fully clockwise position.
3. Insert a Lockwasher (P/N 80043400) and Spring Binding Post (P/N 80022300) onto the Standoff.
   Tighten the Binding Post to it's fully clockwise position.
4. Add the Earth Ground Label (P/N 41012200) below the Binding Post on the Front Panel.

1.9.7 Communications Interface

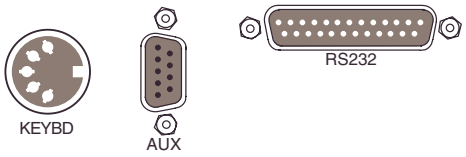


Figure 1-14. Communications Interface

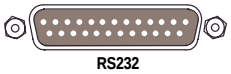
The communications interface consists of three ports, from right-to-left:

- RS-232 and Ethernet Port
- AUXiliary Port
- XT Keyboard Port

The **RS-232** connector is a dual function port. Pins 14 through 19 are dedicated to the Ethernet Port and pins 2, 3, and 7 are dedicated to the RS-232 Port.

The **AUX**iliary Port is used for chaining units. The **KEYBD** port is used for connecting a PC-XT keyboard to the unit.

1.9.7.1 RS-232/Ethernet Port



The 25-pin 'D' connector (labeled RS232) is a dual-function connector, with three pins dedicated to the RS-232 I/O and six pins dedicated to the Ethernet I/O.

DB25 Pin #	Ethernet Function
14	Transmit +
15	Transmit -
16	Receive +
17	Receive -
18	Clock +
19	Clock -

DB25 Pin #	Ethernet Function
2	Transmit Data
3	Receive Data
7	Signal Ground

DB-25 Male Connector on Front of AM2 or one of the two male connectors on the 1-into-2 DB-25 Expansion Cable Ameritec P/N 48-018900

Figure 1-15. RS-232/Ethernet Port

1.9.7.1.1 RS-232 Port

The RS-232 port is used for the following:

- Downloading Scripts and Protocols
- Saving Scripts and Protocols
- Sending Control Commands (in lieu of using the Ethernet port)
- Used in conjunction with the AUX connector to chain units (Fig 1-22)
- Setting up the Ethernet address

Figures 1-16 through 1-18 list the optional Ameritec cables that are available for connecting to a PC, a Printer, or for Chaining.

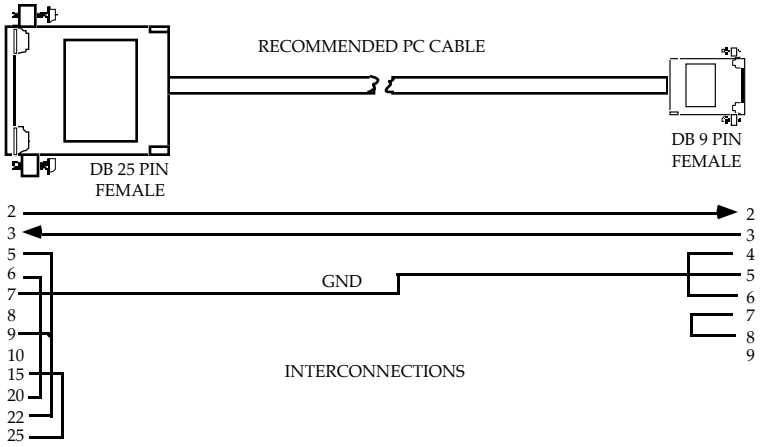


Figure 1-16. PC Cable [RS-232 Port to 9-pin Female Connector (48-0107)]

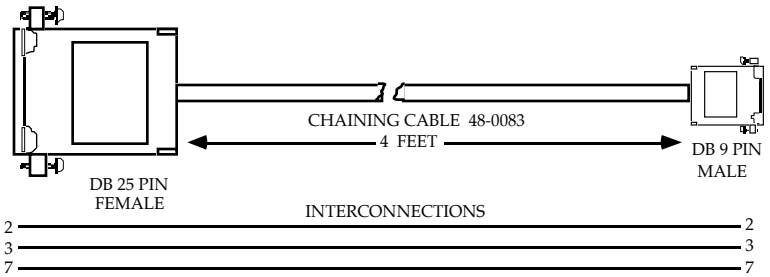


Figure 1-17. Chaining Cable [Auxiliary Port to RS-232 Port (48-0083)]

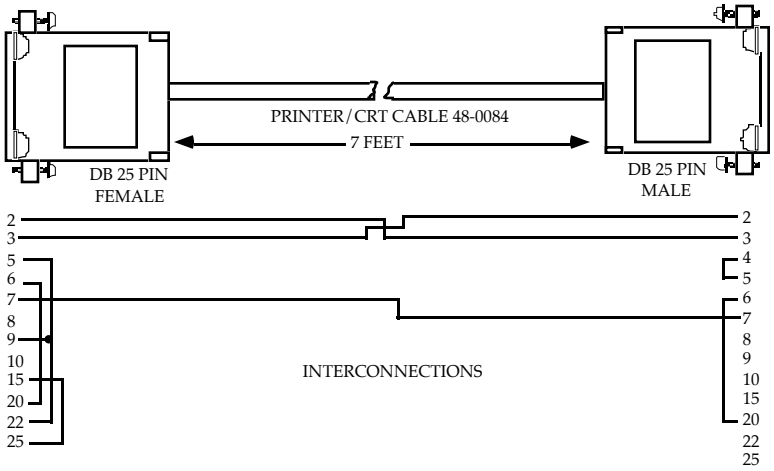


Figure 1-18. Printer Cable (48-0084)

1.9.7.2 RS-232/Ethernet Port and 10BASE-T Interface

The Ethernet connections are made through the RS-232 connector as shown in ¶1.9.7.1. A DB-25 to RJ-45 (P/N 480192) 10Base-T Ethernet adapter is shown in Figure 1-19, and conforms to the IEEE 802.3 Specification.

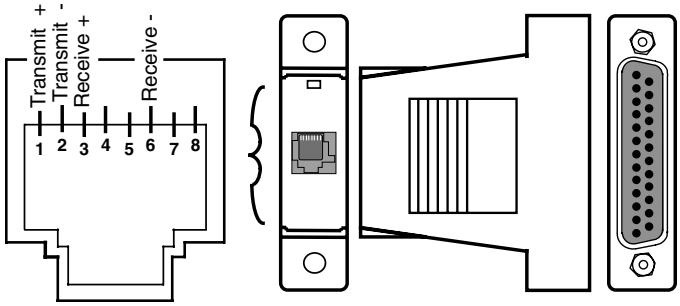


Figure 1-19. DB-25 to RJ-45 10Base-T Ethernet Adapter (48-0192)

The Standard RJ-45 cable is used to connect to an Ethernet hub, while the Crossover RJ-45 cable is used to connect to a Workstation. Both configurations require the Transmit and Receiver pairs to be twisted pairs. Tables 1-2 and 1-3 show the cabling pinouts for each configuration.

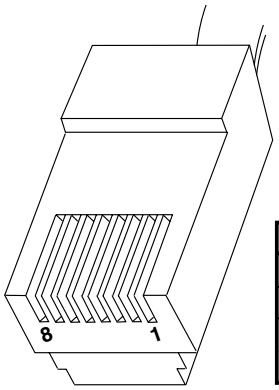


Table 1-2. Standard RJ-45 Cable Pinout

RJ-45	Signal	RJ-45
1	Transmit +	1
2	Transmit -	2
3	Receive +	3
6	Receive -	6

Table 1-3. Crossover RJ-45 Cable Pinout

RJ-45	Signal	RJ-45
1	Transmit +	3
2	Transmit -	6
3	Receive +	1
6	Receive -	2

The adapter can be connected to one of the male connectors on the dual-function cable to provide a 10Base-T Ethernet interface.

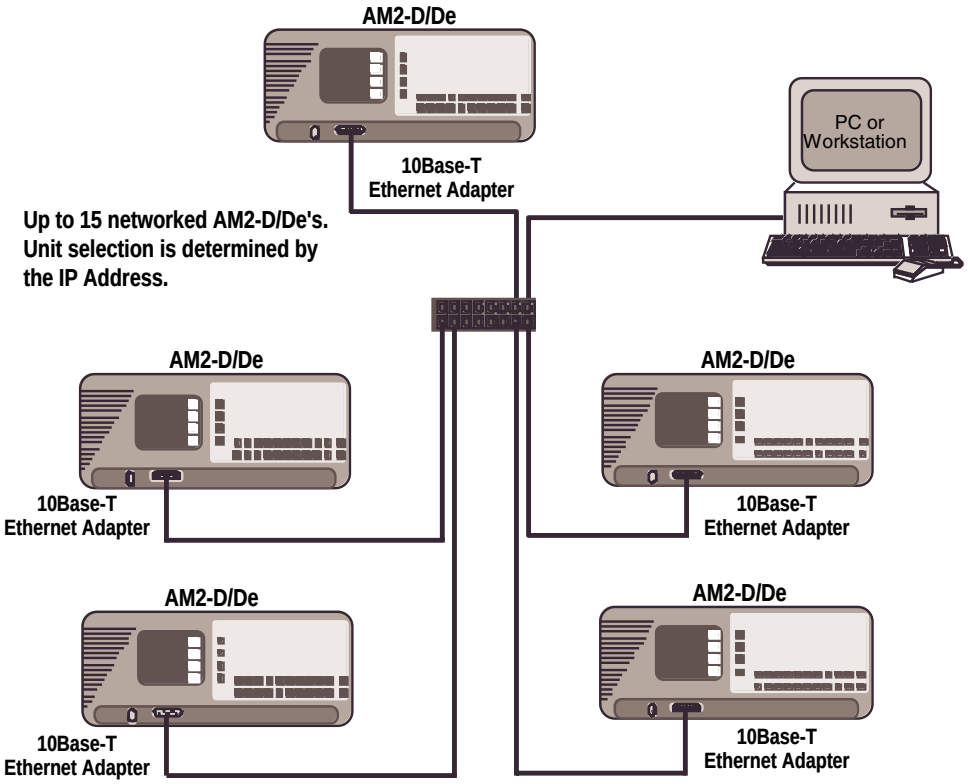


Figure 1-20. Ethernet Network Layout

The dual function cable, P/N 48-0189, allows you to simultaneously connect the Ethernet and RS-232 ports. Only one port, however, can be active at a time. The cable is a 15-inch long ribbon cable with a single DB-25 female connector on the AM2-D/De end and two identically-wired DB-25 male connectors on the other end.

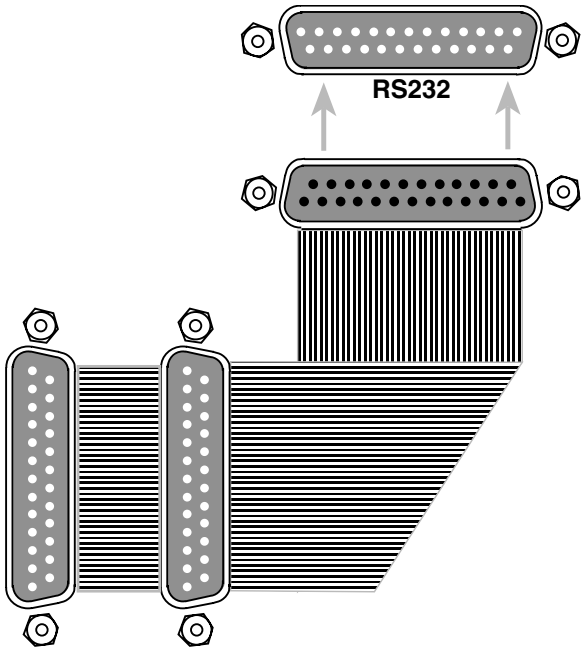


Figure 1-21. RS-232/Ethernet Dual Function Cable (48-0189)

1.9.7.3 AUXiliary Port for Chaining Units

The auxiliary port allows you to chain additional Niagara bulk call generators. Figure 1-22 shows how to interconnect multiple units in a chain. The **AUX** port of one unit connects to the RS-232 port of the next unit and so on, for up to a maximum of 15 units. Each unit is addressed individually, based on its position in the chain.

The unit directly connected to the PC or RS-232 Terminal is always Unit A and is addressed as **!A**. The second unit in line is addressed as **!B**, and so on, with the fifteenth unit addressed as **!O**. A sixteenth address, **!Z** allows you to broadcast the same command to all units simultaneously.

Broadcast mode is the default mode that the chain assumes before any other addressing commands are sent. If any unit in the chain lost power or was rebooted, try sending a **Ctrl-E** to clear the communications channel before attempting to send any further chaining commands. Once you initiate an address command for a specific unit, all future commands are directed to that unit until you send a different address command.

When chaining, you can mix Niagara (AM2), Crescendo (CRS), and Squirt (AM2S) units on the same chain. You can also mix individual models within each group such as an AM2-P, AM2-A, AM2-D, AM2-B, etc.

CAUTION: If you do mix models, be careful not to send model specific commands in broadcast mode.

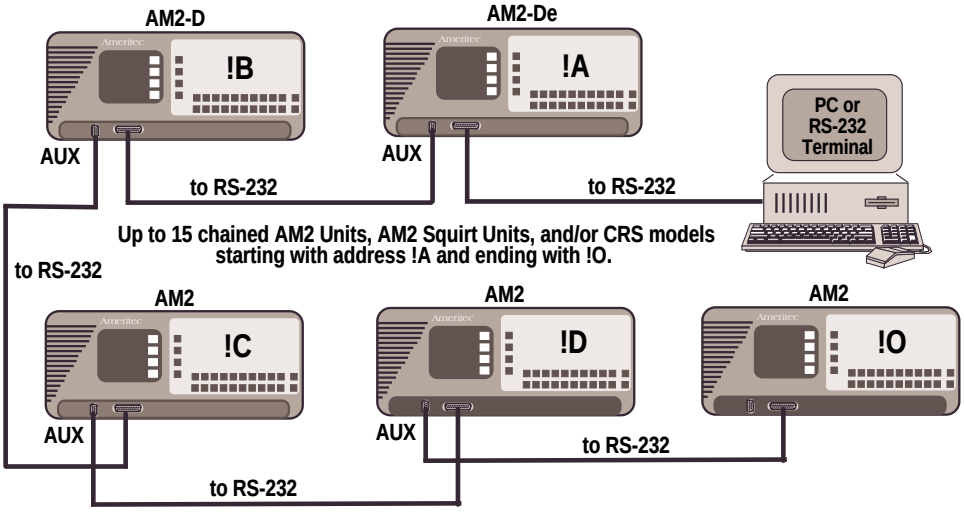


Figure 1-22. Chaining Layout

1.9.7.4 Test Ports

WARNING: To prevent an electrical shock hazard, during normal operation avoid connecting PCM I/O Ports or cables with exposed metal conductors to an unprotected external telephone network such as a line repeater.

The Line Interface consists of six possible connector port options.

- Bantam PCM Connector(option no. 280130AY-1) (standard with AM2-D)
- Tri-Banana PCM Connector (option no. 280130AY-2)
- BNC PCM Connector (option no. 280130AY-3) (standard with AM2-De)
- Siemens PCM Connector (option no. 280130AY-4)
- Bantam PCM Connector (120Ω impedance) (option no. 280130AY-5)

Each option contains four multiplexed paired lines (24 bearer channels allowing for a 96-call total for AM2-D, and 30 bearer channels allowing for a 120-call total for AM2-De). Each pair is the equivalent of a two wire digital line with one Tip and one Ring lead. Each line is designated by a letter (A to D), and each channel by a number which corresponds to channel assignments in the Call Program parameter channel_no.

AM2-D Line/Channel Designations

Line A Tx	Line A Rx	Line B Tx	Line B Rx	Line C Tx	Line C Rx	Line D Tx	Line D Rx
A01-A24	A01-A24	B01-B24	B01-B24	C01-C24	C01-C24	D01-D24	D01-D24

AM2-De Line/Channel Designations

Line A Tx	Line A Rx	Line B Tx	Line B Rx	Line C Tx	Line C Rx	Line D Tx	Line D Rx
A01-A30	A01-A30	B01-B30	B01-B30	C01-C30	C01-C30	D01-D30	D01-D30

PCM Line Interface Connector Options

The unit comes with one of five different PCM Line Interface Connectors. There are five options in all, and any of the options may be ordered from Ameritec to be retrofitted, or when ordering the unit.

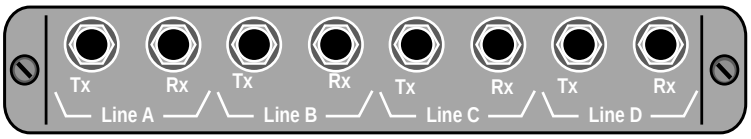


Figure 1-23. Bantam PCM Interface Connector (280130AY-1)

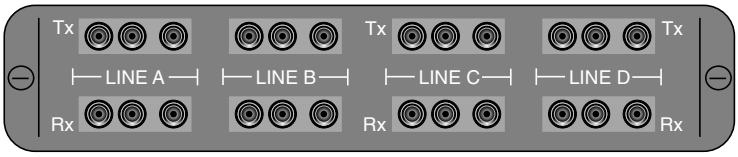


Figure 1-24. Tri-Banana PCM Line Interface Connector (280130AY-2)

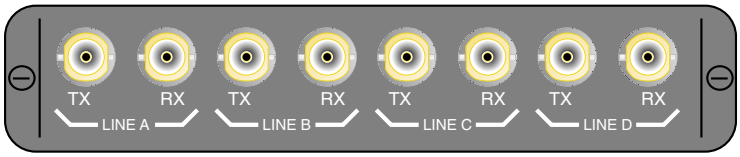


Figure 1-25. BNC PCM Line Interface Connector (280130AY-3)

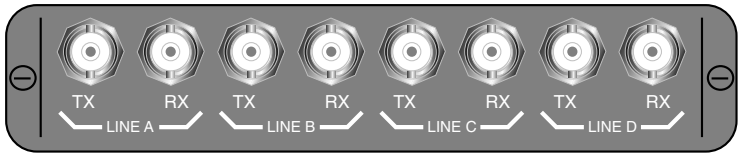


Figure 1-26. Siemens PCM Line Interface Connector (280130AY-4)

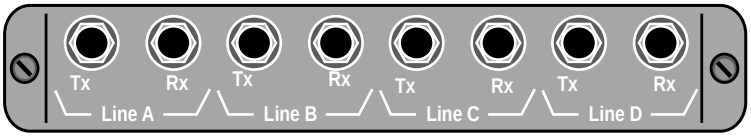


Figure 1-27. Bantam PCM Interface Connector with 120Ω balanced impedance (280130AY-5)

1.9.8 Non-Volatile Memory

Power loss during a test causes unit operation to cease, however, non-volatile memory maintains Scripts, Protocols, and test setups such as Call Test Sets. At restoration, the unit outputs real-time messages indicating the time that power was lost and when it was restored. The unit also automatically restarts any tests that were in progress at the time of a power loss.

Non-volatile memory is maintained by a 3.9V Lithium battery (P/N 88000100) and has a life expectancy of six years if the unit were operated continuously.

Table 1-4 shows battery life expectancy based on usage. The battery is drained anytime AC power is removed from the unit. The battery will not run the unit; its sole purpose is to maintain the integrity of files stored in non-volatile memory.

Table 1-4. Battery Life Expectancy

Unit On-Time (hours per day)	Battery Life before Replacement
0	458 days (15 months)
8	687 days (23 months)
24	6 years (72 months)

CAUTION: Dispose of Lithium Batteries in accordance with applicable local regulations.

To avoid downtime, the battery, Ameritec P/N 88000100, should be replaced periodically, based on the usage indicated in Table 1-4. Battery replacement can be performed in the field or at Ameritec. For field replacement, contact Ameritec Customer Service and ask for a new battery. Follow the procedures listed below to replace a battery:

1. Back up Scripts, Protocols, Call Programs, and Call Test Sets before replacing the battery. See paragraph 3.5 as it relates to the **Backup Unit Files** from the FeatureCall **File** pull-down menu.

1.9.8.1 Replacing the Lithium Battery

The lithium battery is located on the Master I/O board, P/N 280191AY-1. The CPU board, P/N 280190, is piggy-backed onto the I/O board and must first be removed to access the battery.

Perform the following to replace the battery.

1. If battery is not completely dead, backup Scripts, Protocols, Call Programs, and Call Test Sets using the **Backup Unit Files** feature in FeatureCall (see ¶3.5, this manual, for details).
2. Remove front panel.
3. Locate the piggy-backed cards in slots 13 and 14 and remove the applicable cables.
4. Slide the piggy-backed cards out of the card slot.
5. Using a #1 Philips screwdriver remove the four screws securing the CPU to the Master I/O card.
6. Gently separate the two boards.

CAUTION: To avoid bending connector pins avoid separating the boards as a clamshell. Keep the boards as close to parallel as possible during separation.

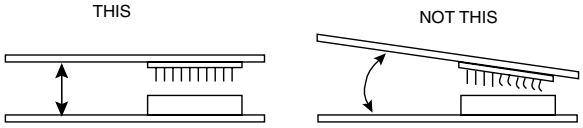


Figure 1-28. Separating CPU and Master I/O

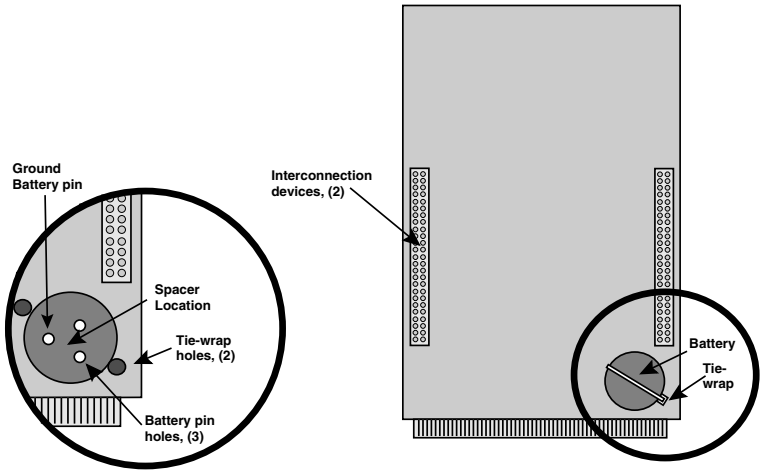


Figure 1-29. Lithium Battery Location on Master I/O Board

7. Using side-cutters cut the tie wrap securing the battery to the Master I/O card. If it is real tight, you may use an orange stick to gently pry it out.
8. Align the pins on the new battery with the receptacles on the Master I/O card and press the new battery in place.
9. Install a new tie wrap with the knot facing the nearest corner.
10. Tighten the tie wrap as needed to secure the battery and trim the excess.
11. Align the CPU connectors with the Master I/O connectors and press the two boards together being careful not to bend any pins.
12. Reinstall the Philips screws.
13. Slide the piggy-backed card set back into the card cage and press the Master I/O connector into the back plane.
14. Reconnect the cables.
15. Re-install the front panel. Tighten each screw about a 1/4 turn at a time, alternating back and forth between the screws until the front panel is secure.
16. Reconnect power and the Network.
17. Using the FeatureCall **Restore Unit Files** feature, transfer the Scripts, Protocols, Call Programs, and Call Test Sets previously removed.

Which Files Do I Transfer to a PC?

If you have the original factory diskette that contains factory loaded scripts and protocols, you only need to transfer user created programs. These usually include user-written or modified factory scripts stored in locations 11-20. If you don't have the factory diskette, transfer all the protocol and script files to a PC/Workstation.

1.9.8.2 Battery Back-Up Board

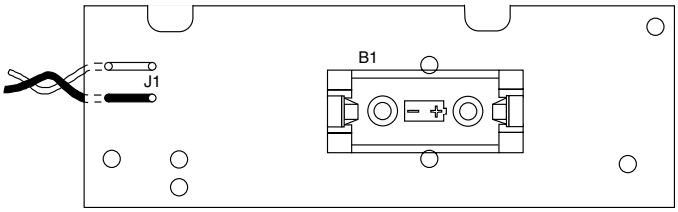


Figure 1-30. Battery Back-Up Board

The Battery Back-up Board provides 6V power at 1/2 amp to the AM2 unit from an internal source if there is a drop in the external voltage coming into the unit. The board is capable of supplying 6V power for up to one year if the unit is maintained in a power-off condition, or for up to three years if the unit is maintained with power on. This provides enough power to save Customer Statistics in CMOS in case of an external power failure.

The Battery Back-up Board is attached on the LED Display board, P/N 280125AY.

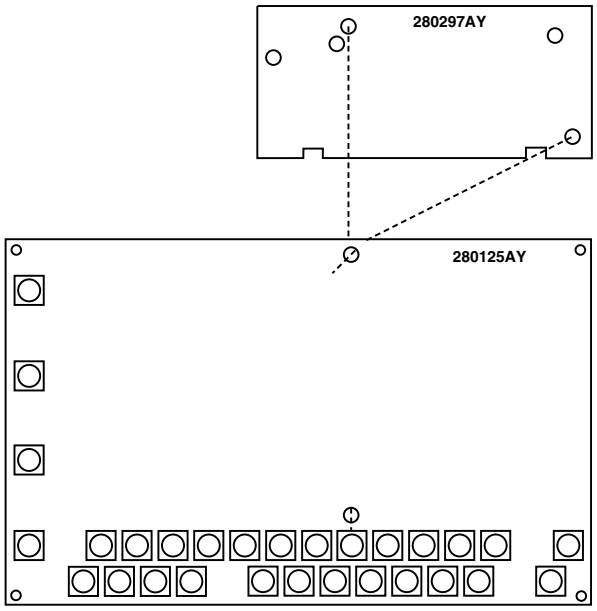


Figure 1-31. Battery Back-Up Board Location

1.9.9 Cooling

The AM2-D/De dissipates less than 300 Watts of exchanged heat. A fan draws heated air away from the power supply, display, and plug-in modules and exhausts it out vents on the tapered left side of the front panel. For most environments, no special-concern airflow clearance requirements are needed.

2. GETTING STARTED

There are three methods available to assist a new user in controlling the AM2-D/De Call Generator: the Front Panel, Command Line Interface, and FeatureCall®.

2.1 Front Panel Getting Started

This section is task oriented. The presentation order is generally the order in which you would perform these tasks. The majority of the functions that you will be performing are presented in this section. Some features are not needed for the basic operations and are covered elsewhere. These features include items such as Auto Scheduling of Tests and outputting various listings from the report menu (Section 4), and editing Script Files (Script Writer's Guide). Other sections of the manual include:

- **Section 3.** File management tasks, including the editing and transferring of files. Chaining multiple units is covered in Paragraph 1.9.7.3.
- **Section 4.** A listing of each AM2-D/De screen in function key order.
- **Section 5.** An alphabetical listing of commands and related syntax.
- **Section 6.** Keyboard equivalents for an XT-compatible keyboard.

2.2 Test Setup Procedures

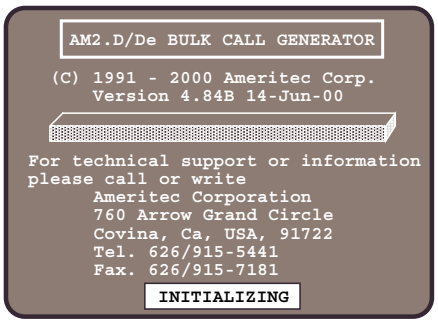
Test Setup consists of:

- applying power
- configuring the unit
- assigning protocols to specific line numbers
- assigning a script to a numbered call program
- assigning values to the call program parameters
- assigning call programs to sets
- selecting and running a set of call programs
- selecting the test results format
- viewing the test results

Note: Related Control Commands are provided at the end of each topic, to enable this section to be used as a guide to operating the unit from an RS-232/Ethernet Workstation.

2.2.1 Applying Power

1. Connect the PCM cables to/from the AM2-D/De in the following manner:
   Tx Line A to Rx Line B
   Tx Line B to Rx Line A
2. Connect the AC adapter to a universal AC Source: (90-264 VAC @ 50-60 Hz).
3. Turn the power switch on. The unit displays the initialization screen, which lists the:
   - Model Number
   - Software Version
   - Address and Phone Number for Technical Support
   - Current Status Caption

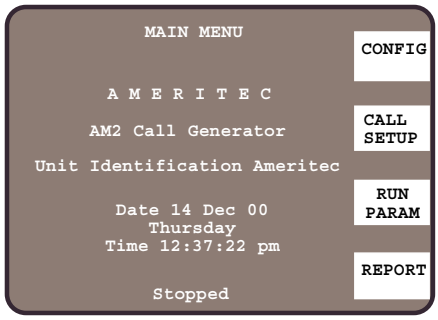


The current status caption displays four power-up messages in the following order: **INITIALIZING**, **TESTING DSP CARDS**, **SETTING UP TESTS**, and **Press a key to start** .

4. Press any key except **FCN**, **START**, or **FINISH**. The unit displays the MAIN MENU.

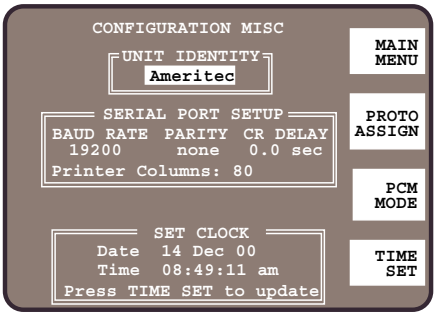
Related Control Command	
RM	Displays Unit ID, Model Number, Software Revision and Date, as well as the unit status.

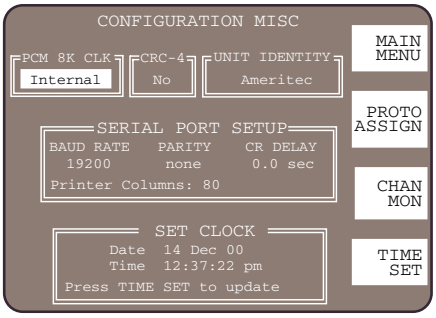
The MAIN MENU is the point of access for the CONFIGURATION MISC, CALL SETUP, RUN PARAMETERS, and REPORT menus. The MAIN MENU displays the unit ID, the date and time, and the current status. Status messages include: Stopped, Running Set n, Finished, Sequence Armed, and Running Null Set.



2.2.2 Configuring the AM2-D/De

Configuring the AM2-D/De consists of selecting the CONFIGURATION MISC menu by pressing **F1** on the MAIN MENU.





The following actions are required to configure the AM2-D/De:

- setting the clock for internal or external
- setting the framing with or without CRC-4 (AM2-De only)
- setting the Unit ID
- setting the RS-232 Serial Port
- setting the report column width
- setting the date and time
- setting the error message format (Command Mode Only)

2.2.2.1 Clocking

The AM2-D/De provides you the option of synchronizing the 8 KHz PCM clock internally (Internal) or by selecting the clock from one of the four lines (Line A, Line B, Line C, Line D).

2.2.2.2 Framing (AM2-De only)

The AM2-De provides a choice of multiframe with (Yes) or without (No) Cyclic Redundancy Check. To change framing, use the **FIELD CONTROL** keys to highlight the CRC-4 box and the Δ or ∇ **VALUE** keys to select Yes or No.

2.2.2.3 Unit ID

Setting the UNIT IDENTITY allows you to have a specific Unit ID appear in the command prompt, on reports, and on error messages. The default Unit ID is Ameritec. To set the UNIT IDENTITY, perform the following:

1. From the MAIN MENU press **F1** (CONFIG). The unit displays the CONFIGURATION MISC menu with the UNIT IDENTITY field highlighted.
2. Using the front panel 'Input' keys or a PC-XT keyboard, enter an alpha-numeric sequence up to eight characters long.

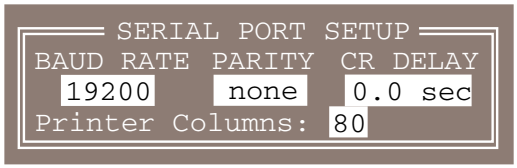
Note: Alpha characters A, B, C, D, E, w, p, f, and t may be entered from the front panel. To enter other alpha characters, connect a PC-XT keyboard to the **KEYBD** connector below the display.

Related Control Commands:

MU <name> Allows entry of a new Unit Identity up to eight characters in length.

M1 Entering **M1** causes the monitor to display the new Unit Identity followed by a prompt (>) on the next command line.

2.2.2.4 Serial Port Setup



The SERIAL PORT SETUP allows you to set both the baud rate and parity for the serial port. It also allows you to set the printer column width.

Baud Rate

The SERIAL PORT SETUP allows you to configure the RS-232 settings to match your terminal or printer. The RS-232 settings include BAUD RATE and PARITY. Using the Δ or ∇ **VALUE** keys, you may set the baud rate to 300, 1200, 2400, 4800, 9600, or 19200.

Parity

Press the Δ or ∇ **VALUE** keys to set the parity for none, odd, or even.

CR Delay

The carriage return delay (CR DELAY) setting allows you to connect an older printer that requires a delay to allow the print head to move to the left and the paper to move up one line. Most printers do not require a delay. Using the numeric keys, you may enter a value from 0.0 to 9.9.

Printer Column Width

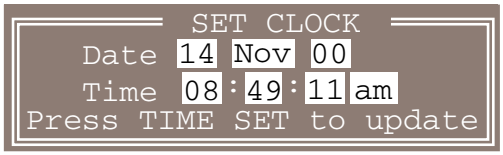
The Printer Columns setting allows you to adjust the width of your listing to accommodate the width of the multiple column Call Statistics Report or to adjust the width of your listings to accommodate the maximum allowable characters that the printer can print per line. You may enter a printer column width of 40 to 132 characters.

Note: To assure column alignment, set the character width on your printer and/or PC, workstation, or terminal to the same setting as the AM2-D/De.

Related Control Command:

CC nnn where **nnn** is a column width between 40 and 132.

2.2.2.5 Setting the Time and Date



The SET CLOCK field allows you to set the time and date. The unit prints/displays the Time and Date on all reports and error messages.

Date

The Date setting contains three fields, the day, month, and year. You may use the **VALUE** or numeric keys to set the day and year, but you must use the **VALUE** keys to set the month.

Time

The Time setting contains four fields, the hour, minute, seconds, and am/pm field. The hour setting is based on a twelve-hour clock. You may use either the **VALUE** or numeric keys for the first three entries, but you must use the **VALUE** keys to set the am/pm entry.

When you finish entering the time or date, press **F4** (TIME SET) for the changes to take effect. The unit displays a clock symbol to the right of the time setting. Press **F1** to return to the MAIN MENU to view the new time/date.

Related Control Command:	
MT yyMMDDdhhmmssp	See Section 5, Command Reference for details.

2.2.2.6 Setting the Error Message Format (Command Mode Only)

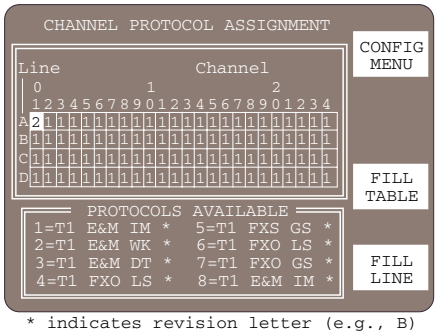
This command allows you to display/print error messages in a long (verbose) or short (terse) format. The long form is the default. You cannot change the Error Message Format from the unit Front Panel.

To set the Error Message Format, perform the following related Control Command:

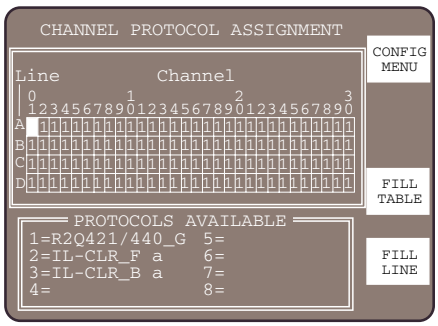
Enter **MV 0** for the short format or **MV 1** for the long format.

2.2.3 Assigning Protocols to Specific Channel Numbers

A protocol defines how an AM2-D/De line responds to stimuli (Events). Each AM2-D contains four line cards that control 24 channels per line. Each AM2-De contains four line cards that control 30 channels per line. Each channel has its own protocol state machine that must be assigned a protocol.



AM2-D



AM2-De

Figure 1-6, LED Panel, contains the channel assignments. To assign protocols to one or more channels, perform the following:

1. From the CONFIGURATION MISC menu, press **F2** (PROTO ASSIGN). The AM2-D displays the CHANNEL PROTOCOL ASSIGNMENT menu, shown above on the left. The AM2-De displays the CHANNEL PROTOCOL ASSIGNMENT menu, shown below on the left.
2. Use the **FIELD CONTROL** keys to highlight the channel to which you want to add or change a protocol assignment, then the numeric keys to enter the selected protocol.

Note: The unit does not display the soft functions **F3** (FILL TABLE) and **F4** (FILL LINE) until you highlight a channel box and change a protocol assignment number.

The listed protocols available are examples only and may not reflect the actual protocol(s) loaded on your unit.

3. Enter a protocol number from the PROTOCOLS AVAILABLE list. The unit displays the FILL TABLE and FILL LINE options (**F3** and **F4**).

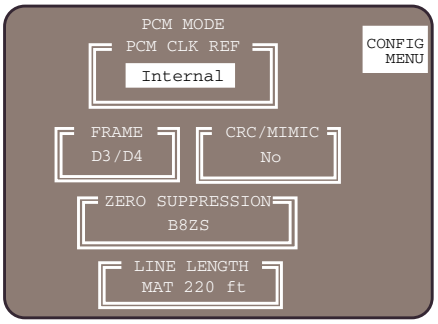
4. If you are only using one protocol for all testing, press **F3**. The unit assigns the same protocol to all channels on all lines.
5. For multiple protocol assignments, you can select **F4**, and the unit will assign the remainder of the channels on the line to that same protocol.
6. Repeat steps 2, 3, and 5 for multiple channel assignments.
7. Press **F1** twice to return to the MAIN MENU.

Related Control Commands

RA To view current protocol assignments.
PA ccc=n To assign a protocol to a single channel (**ccc**=channel #; **n**=protocol #).
PA ccc-ccc=n To assign a protocol to a range of channels.

2.2.4 PCM Mode (AM2-D only)

The PCM Mode screen allows you to match the physical characteristics of T1 lines with that of the switch under test. To select the PCM Mode menu, press **F3** (PCM MODE) on the CONFIGURATION MISC menu. After setting the parameters on this menu, press **F1** (CONFIG MENU) to return to the CONFIG MISC menu.



PCM CLK REF

This parameter sets the source of the PCM clocking.

- **Internal:** The clocking signal originates within the AM2-D. The LINE TX connector becomes the source clock.
- **Line A, B, C, or D:** Selects the respective Line receive port (RX) as an external source clock.

FRAME

This parameter selects the span framing type assignment for the tested circuit.

- D3/D4 selects superframe.
- ESF (Extended Super Frame) selects Extended Super Frame.

CRC/MIMIC

This parameter selects whether CRC/MIMIC checking is enabled (YES) or disabled (NO). The setting must match the CRC/MIMIC setting of the equipment under test. When set to YES:

- CRC checking is performed on PCM lines with ESF framing.
- MIMIC is performed on PCM lines with D3/D4 framing.

ZERO SUPPRESSION

This parameter determines the way that a PCM line handles a string of zeroes. Most T1 configurations use B8ZS.

- B8ZS (BiPolar with Eight Zeros Substitution): Inserts two bipolar violations when eight consecutive "0's" are encountered. The receiving equipment recognizes the BPVs and correctly interprets the data.
- AMI (Alternate Mark Inversion): AMI does not inject Bi-Polar Violations and is subject to synchronization loss with a long string of zeroes. AMI is seldom used.

LINE LENGTH

This parameter selects the Cable Type and Line Length. Cable types are MAT and ABAM. Several Line lengths are provided for each cable type.

2.2.5 Creating a Call Program

A Call Program consists of an assigned script with one or more parameter values that make it unique from other Call Programs. This subsection describes how to assign a script to one or more Call Programs. Subsection 2.2.6 describes how to assign unique values to a Call Program's parameters.

A script is a text file with specialized syntax that forms the template for the AM2-D/De to follow when it originates or terminates a call. Your unit shipped with one or more script files installed. Factory loaded scripts are also contained on a diskette that is shipped with the unit. These scripts reside in locations 1-10. User modified scripts, if any, occupy locations 11-20.

A call program is a program that assigns user and default parameters, such as call channels and phone numbers, to a selected script. The AM2-D/De can have a total of 480 different call programs.

Note: On a new unit, you need to create your own call programs. When creating call programs, try organizing your most frequently used call programs to track the sequence of the originating or terminating line numbers. Where more than one script is used, try grouping Call Programs by script numbers; e.g., if you assign Script #1 to channels A01 through A10 and Script #2 to channels B12 through B21, assign the Call Program numbers as 101 to 110 and 212 through 221, respectively.

Any program number between 1 and 480 may be used, but the general idea is to make it easy to keep track of which scripts and call programs control which channels without having to scroll through the CALL SETUP menu PROG SCRIPT window. This method should allow enough open ranges of numbers to create programs for specialized testing.

Creating Call Programs

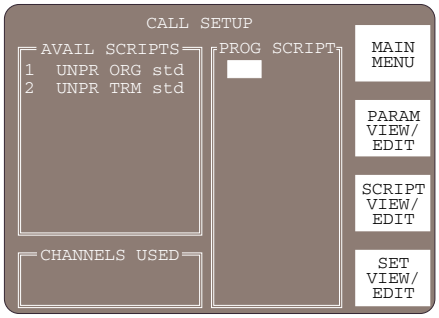
This subsection and subsection 2.2.6, Viewing, Editing, and Assigning Values to a Call Program's Parameters, are presented both as a tutorial and step-by-step procedure.

If you follow the next few pages as a tutorial, you will be assigning Script 1, unpaired originate, to Call Programs 101-108 and Script 2, unpaired terminate, to Call Programs 209-216. Any variables and results in the text that are based on these examples are shown as ***bold italic***. A ***bold italic*** entry indicates that you can substitute real testing values.

If you are a new user, try entering the tutorial values and checking the onscreen results. When you feel comfortable with the concepts, repeat the procedure using values that match the switch that you are testing. If you have used other AM2 products, start substituting values on your first pass through the procedure.

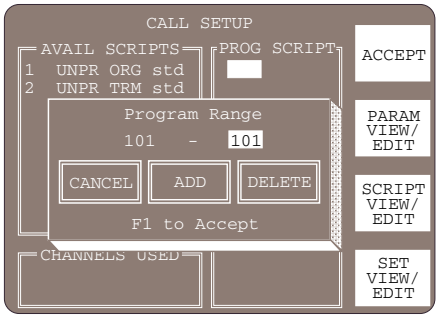
In the following steps, the most direct approach is not always given, so that a less intuitive approach, such as entering a range, can be presented and repeated.

For example, steps 2 and 3 ask you to enter a range from 101 to 101. An easier alternative would be to enter 101 in the PROG column. For your first pass, however, try using the procedure the way that it is presented.

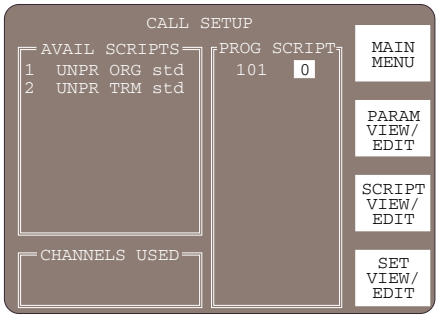


If you want to create new Call Programs or modify existing Call Programs on a unit that has already been used, perform the following:

1. From the MAIN MENU, press **F2** (CALL SETUP). The unit displays the CALL SETUP menu.
2. Press **FCN** followed by a **VALUE** key. The unit displays the Program Range window and changes the function of **F1** to ACCEPT.



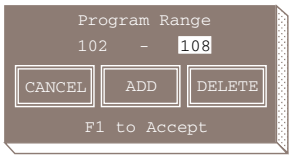
3. Using the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys, enter a single Call Program (e.g. ***101*** to ***101***).



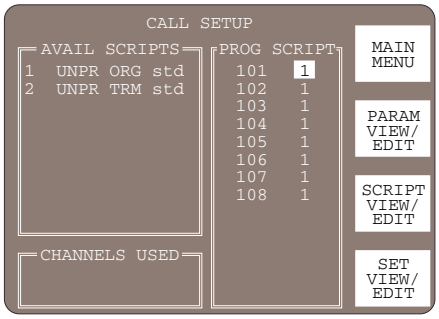
4. Using the **FIELD CONTROL** keys, highlight ADD and press **F1** (ACCEPT). The unit displays one call program with a script assignment of zero.

Note: If the unit has Call Program assignments, you can use the same Program Range window to delete unwanted programs, then repeat the process for programs to add.

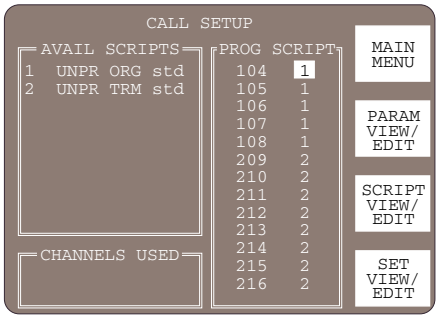
5. Using the **FIELD CONTROL** keys, highlight the zero in the Script column and enter script number ***1*** from the AVAIL SCRIPTS list.



6. Highlight a Call Program in the PROG column (***101*** in our example).
7. Press **FCN** followed by a **VALUE** key. The unit displays the Program Range window and changes the function of **F1** to ACCEPT.



8. This time, add a range of call programs that will be using the same script (in our example, Call Programs ***102*** to ***108***).
9. Use Field Control keys to highlight ADD and press **F1** (ACCEPT). The unit displays the new programs in the PROG SCRIPT window with the designated Script assigned (in our example, ***101*** to ***108*** with Script ***1***).
10. Repeat steps 2 through 9 for each additional Script assignment. If you are following our example, assign Script ***2*** to Call Programs ***209*** to ***216***.



Hint: During step 10, if you highlighted a previous program with Script ***1*** assigned and entered the new range in the Program Range window, then the new Call Programs all have Script ***1*** assigned and need to be individually changed to Script ***2*** ... a tedious process, at best. An easier way to have the range appear with the correct script assignments is to:

- create the lowest numbered Call Program in the new range
- assign the new script to that program
- highlight that program number
- assign the new range in the Program Range window.

Note: The PROG SCRIPT window can only display 13 Call Programs at a time. When creating more than 13 Call Programs, verify your assignments by using the ⇧ and ⇩ keys to scroll through the list.

Note: In our examples, scripts 1 and 2 represent unpaired scripts. However, the number associated with these scripts may be different on your unit. Remember to use the number on your unit accordingly.

Before moving on to the next subsection, take a few moments to practice adding and deleting Call Programs. If you're following our example, try deleting all the programs, then try entering the same programs without looking at the procedure. Also try a few new things, like pressing the **FCN** key followed by the **DELETE** key with a Call Program number highlighted. Try the same thing with a SCRIPT number highlighted (it doesn't work). Also try entering the programs and scripts without using the range window.

Related Control Commands

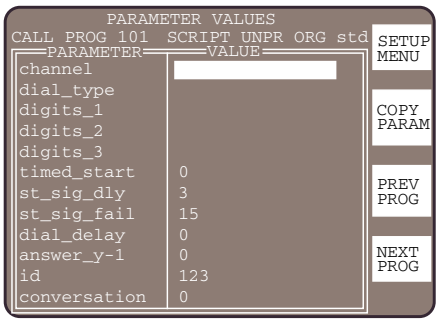
RT 0 Lists available scripts.
HD prog Lists assigned Call Programs.
TK ppp/ppp-ppp Delete one Call Program or a range of Call Program(s).
PL ppp/ppp-ppp ss Assigns script **ss** to Call Program(s) **ppp**.

2.2.6 Viewing, Editing, and Assigning Values to a Call Program's Parameters

Parameter values are the items that make one Call Program different from another Call Program that uses the same Script. Parameters are script variables that allow you to assign lines and telephone numbers, establish delays, set the number of rings, etc. Some parameters have factory defaults assigned, while others, such as line/channel assignments, must be entered for the Call Program to operate.

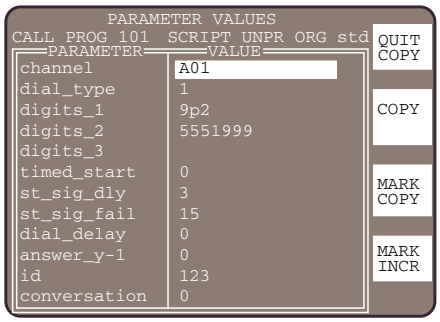
To view, edit, or enter a Call Program's parameters, perform the following:

1. From the CALL SETUP menu, highlight the lowest numbered Call Program you created (in our example, Call Program ***101***).
2. Press **F2** (PARAM VIEW/EDIT). The unit displays the PARAMETER VALUES screen.
3. Using the ⇩ key, scroll through the listed parameters.



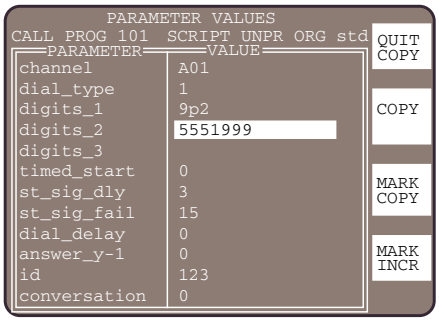
Note: Two types of parameters are listed, those with factory defaults assigned and those with no values assigned. For the purposes of Getting Started we will be focusing only on the parameter values that must be entered to make the Call Program run.

4. Using the⇧ key, scroll back to the top of the parameter list and highlight the channel VALUE.
5. Using the numeric entry keys, enter ***A01*** for Line 1.
6. Highlight the dial_type value field and enter ***1*** for pulse dialing.
7. Highlight the digits_1 value field, and enter ***9p2***. To enter p, press **FCN** followed by **7**.

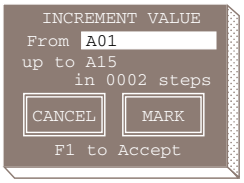


Note: In this step, enter ***9*** to simulate asking the switch for an outside line. Enter ***p2*** to tell the unit to pause in the dialing sequence for a maximum of 2 seconds to wait for the switch to provide dial tone.

8. Highlight the digits_2 value field. Enter ***5551999***.



9. Highlight the channel VALUE field and press **F2** (COPY PARAM). The unit displays the COPY PARAMETERS screen. Two means of copying parameters are presented, MARK INCR and MARK COPY. MARK INCR specifies that a value is to be copied to other Call Programs incrementally. MARK COPY specifies that a value is to be copied to other Call Programs as is.
10. Press **F4** (MARK INCR). The unit displays the INCREMENT VALUE window.



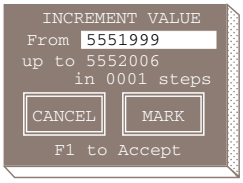
11. Using the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys, enter a range from ***A01*** to ***A15*** and an increment of ***2*** **steps**. This will copy the digits_2 value to channels ***A01***, ***A03***, ***A05***, ***A07***, ***A09***, ***A11***, ***A13***, and ***A15***.
12. Highlight MARK, and press **F1**. The unit displays the COPY PARAMETERS screen and marks the channel value with a plus sign (+).

Note: Always add leading zeroes to the step value, otherwise mathematical carry operations may not work correctly.

Note: In this step, you are assigning odd numbered channels A01 through A15 to the unpaired originate Script #***1***. Later in step 20, you will be assigning these channels to Call Programs ***101*** through ***108***. We are selecting these channels to give you an example of incrementing by 2, you could just as easily have incremented by 1 and assigned channels A01 through A15 both odd and even to Script 1.

13. Highlight the dial_type value ***1*** and press **F3** (MARK COPY) to copy the value "as-is" to the designated Call Programs. The unit marks the dial_type value with an asterisk (*).

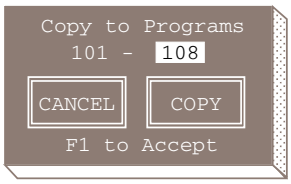
14. Highlight the digits_1 value ***9p2*** and press **F3** (MARK COPY) to copy the value "as-is" to the designated Call Programs. The unit marks the digits_1 value with an asterisk.
15. Highlight the digits_2 value ***5551999*** and press **F4** (MARK INCR). The unit displays the INCREMENT VALUE window.



16. Using the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys, enter a range from ***5551999*** up to ***5552006*** with an increment of ***0001*** **steps** to copy digits_2 values from ***5551999*** to ***5552006*** to the designated Call Programs.

Note: Reference ¶2.10.3.1.1 for specific details related to Incrementing a value.

17. Highlight MARK, and press **F1**. The unit displays the COPY PARAMETERS screen and marks the channel value with a plus sign (+) to indicate that the value is to be copied incrementally.
18. Press **F2** (COPY). The unit displays the Copy to Programs window.



19. Enter a range of ***101*** to ***108***, highlight COPY, and press **F1**. The unit copies the four marked parameters to Call Programs ***101*** - ***108*** while displaying the Copying status window for each Call Program affected. When all the Call Programs have been updated, the unit displays the COPY PARAMETER menu.
20. Press **F1** (ABORT COPY). The unit displays the PARAMETER VALUES menu with CALL PROG 101 in the title bar.
21. Using **F4** (NEXT PROG), step through the newly created call programs and verify that each Call Program has the correct parameter values.

If you are following the tutorial examples, the incremented values should be as follows:

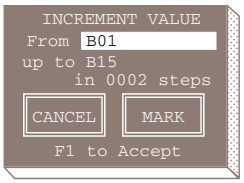
Call Program #	channel	digit_1	digits_2
101	A01	9p2	555-1999
102	A03	9p2	555-2000
103	A05	9p2	555-2001
104	A07	9p2	555-2002
105	A09	9p2	555-2003
106	A11	9p2	555-2004
107	A13	9p2	555-2005
108	A15	9p2	555-2006

Note: If you had any difficulty with the channel (line) assignments or the digit_2 assignment, now might be a good time to practice entering various Mark Increment values and checking the results.

In the following steps, you will be assigning channel numbers to the B channel terminate Call Programs. In our example we will be assigning only the odd-numbered channels ***B01*** through ***B15*** to Call Programs ***209*** to ***216***.

Note: In many cases when performing a line test, originate and terminate may end on different channel numbers. In order to represent a proper line test without an intermittent calling office, the unit must be assigned equal originate and terminate channel numbers, but must contain separate letters (e.g. A to B, C to D).

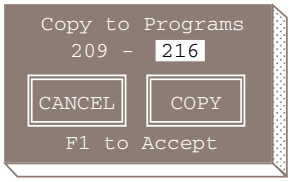
22. From the PARAMETER VALUES menu, press **F3** (PREV PROG) or **F4** (NEXT PROG) until the unit displays CALL PROG ***209*** in the title bar.
23. Highlight channel VALUE and press ***B01***.
24. Press **F2** (COPY PARAM). The unit displays the COPY PARAMETERS menu.
25. Press **F4** (MARK INCR). The unit displays the INCREMENT VALUE window.



26. Using the **FIELD CONTROL**, **CHAR**, **DELETE**, and numeric keys, enter a range of ***B01*** to ***B15*** in ***0002*** step increments, highlight MARK, and press **F1**. The unit displays the COPY PARAMETERS menu and marks the channel VALUE with a plus sign (+).

CAUTION: If you are creating your own Call Programs, do not assign the same channel number to more than one call program if those Call Programs are to be run at the same time.

27. Press **F2** (COPY). The unit displays the Copy to Programs window.



28. Enter the range of the terminate programs (in our example, ***209*** to ***216***), highlight COPY, and press **F1**. The unit copies the channel assignments to Call Programs ***209*** - ***216*** while displaying the Copying status window for each Call Program affected. When all the Call Programs have been updated, the unit displays the COPY PARAMETER menu.
29. Press **F1** (QUIT COPY). The unit displays the PARAMETER VALUES menu with CALL PROG ***209*** displayed in the title bar.
30. Using **F4** (NEXT PROG), scroll through each terminate call program and verify the channel number assignments.
31. Using **F4** (NEXT PROG), step through the newly created call programs and verify that each Call Program has the correct parameter values.

If you are following the tutorial examples, the incremented values should be as follows:

Call Program #	channel
209	B01
210	B03
211	B05
212	B07

Call Program #	channel
213	B09
214	B11
215	B13
216	B15

Related Control Commands	
RV #	Displays the parameters for the designated Call Program #.
PC ppp/ppp-ppp <name>=<value>	Assigns a value to a parameter for a single Call Program or range of Call Programs.
PV ss	Allows you to mark a parameter from a script **ss** for copying or incrementing. Enter **PV** to open up an interactive dialog, which allows you to continue until all parameters for copy or incrementing are added.

This is the end of the tutorial portion of Getting Started. From here forward we will be presenting generic concepts. In the next subsection, you will be adding your own Call Programs to a Call Test Set, so that you can begin actual testing.

Before moving on to the next subsection, take a few moments to practice creating Call Programs and adding or changing Parameters. When you feel comfortable with the concepts presented thus far, enter the actual values that correspond to a switch that you will be testing. Refer to the preceding paragraphs or the related topic in Section 4 only if you are having difficulties.

2.2.7 Call Programs and Call Program Sets

In order for a Call Program to run, you must assign it to a Call Test Set. Once a Call Program is assigned to a set you may:

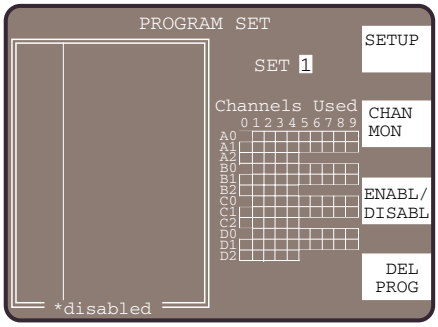
- enable or disable the program.
- remove it from the set.
- return to the CALL SETUP menu and delete it entirely.

2.2.7.1 Assigning Call Programs to One or More Sets

The AM2-D/De allows you to assign a Call Program to up to four sets. Two conditions that will prevent you from assigning a Call Program to a set are:

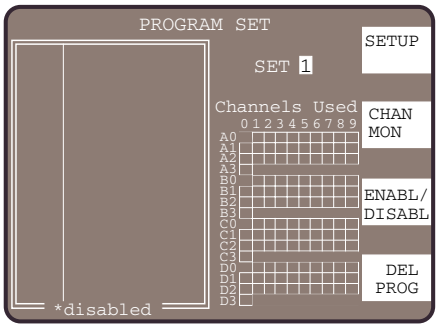
- A Call Program is missing a necessary parameter value, such as a channel number assignment.
- Another Call Program with the same channel number assignment already exists in the set. This condition holds even if the existing Call Program in the set is disabled.

To assign a Call Program or a range of Call Programs to a set, perform the following:



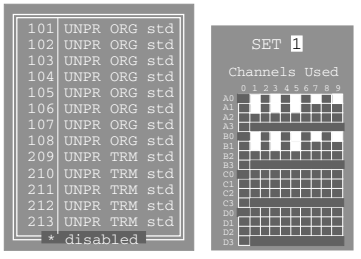
AM2-D

1. From the Call Setup menu, press **F4** (SET VIEW/EDIT). The PROGRAM SET menu is displayed with the SET # highlighted.



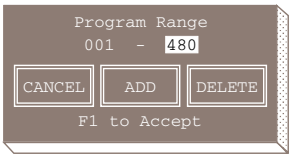
AM2-De

2. Use the **VALUE** keys to select a set. The figure on the left displays an empty set. The double-bordered box on the left of the window lists the Call Program number(s) and script(s) assigned to the highlighted Set #. The Matrix on the right of the screen indicates which channels have been assigned by Call Programs within the set. Shaded boxes indicate a line has been assigned, e.g., A01-A15 (odd) and B01-B15 (odd).



CAUTION: Before loading your Call Programs into a non-empty set, check the Channels Used matrix to verify that programs in the existing set do not have the same line assignments as Call Programs that you are planning to add.

3. To add a single Call Program to a Set, use the ⇦ key to move the cursor to the Table on the left of the menu. Enter a Call Program number at the cursor location.



4. To enter a range of Call Programs to a Set, press **FCN** followed by a **VALUE** key. The unit displays the Program Range window with a default range of 001-480. If you want to assign all of the Call Programs on the unit to a single set, highlight ADD and press **F1**. Otherwise, enter a unique range of Call Programs, highlight ADD and press **F1**.
5. Repeat steps 3 and 4 as many times as needed to add selected Call Programs to a set.

Related Error Messages

If the unit encounters an error, or fails to load a call program, it will issue one of the following error messages:

Conflicting Channel

If a set has a call program containing the same channel numbers as a call program that you are adding, the unit returns the error message Conflicting Channel. The unit leaves the existing call program in the set and will not add the new one. This message is displayed if the conflicting channel occurs within a single Call Program that you are adding, or if the offending Call Program is within a Range of Call Programs that you are adding.

Note: You can have multiple call programs with the same channel numbers, but each set may only have one call program per channel number.

No Such Program

If you try to add a single call program without the proper parameter values or missing values, or if you try to add a call program number that doesn't exist, the unit returns the error message No Such Program. This message is not displayed if the offending call program(s) is within a range of call programs being added. The unit simply will not add that program(s).

Note: The unit displays the Conflicting Channel or No Such Program error message until you press any key except **FCN**, **START**, or **FINISH**.

2.2.7.2 Enabling/Disabling Call Programs

When you add a Call Program or range of Call Programs to a Call Test Set, the programs that you are adding are enabled and ready-to-run. If during the course of testing, you discover a problem in one or more channels, you can localize your testing by disabling unrelated Call Programs. Disabling certain ranges of Call Programs and enabling others also gives you more testing versatility within each Call Test Set. An asterisk to the left of the Call Program number in the PROGRAM SET screen indicates a Call Program is disabled.

To enable or disable one or more Call Programs, perform the following within the PROGRAM SET screen:

1. Use the **FIELD CONTROL** keys to highlight a Call Program number and press **F3**. The unit displays the Program Range screen with the range for the highlighted program listed.
2. To change the minimum range, highlight the minimum range field and enter a new value.
3. To change the maximum range, highlight the maximum range field and enter a new value.
4. Highlight either ENABLE or DISABLE and press **F1**. The unit performs the desired action.

Note: A channel in a disabled Call Program is still an assigned channel. A channel may only be assigned to each set once, regardless of the status of its respective Call Program (enabled or disabled).

2.2.7.3 Removing Call Program(s)

Removing a Call Program removes the Call Program from the displayed set. It does not delete the Call Program. The Call Program is still available to be added, reassigned, or modified.

Removing a Single Call Program

To remove a single call program, highlight the program number and press **F4** (DEL PROG). The unit removes the Call Program from the set.

Removing a Range of Call Programs

To remove a range of call programs:

1. Highlight a program number and press **FCN** following by a **VALUE** key. The unit displays the Program Range window.
2. Enter a range of programs for removal, highlight the DELETE window, and press **F1**. The unit removes the specified program from the set, but does not delete it. The Call Program still exists and may be added later.

Related Control Commands	
RE s/0	Lists the Script and Channel assignments for each Call Program in Set **s** or, if you enter **RE 0**, all sets.
TD s, ppp/ppp-ppp	Disables Call Program(s) **ppp** in Set **s**.
TE s, ppp/ppp-ppp	Enables Call Program(s) **ppp** in Set **s**.
TL s, ppp/ppp-ppp	Adds Call Program(s) **ppp** to Set **s**.
TU s, ppp/ppp-ppp	Removes Call Program(s) **ppp** from Set **s**.

2.3 Selecting the Run and Trouble Mode Parameters

Selecting the Run Mode parameters consists of:

- setting the run mode to synchronous or random operation.
- setting the error thresholds (trouble mode parameters).

2.3.1 Setting the Run Mode

The AM2-D/De gives you a choice of two run modes, **synchronous** or **random**.

In **synchronous** mode, all originate channels go off-hook simultaneously and will not go off-hook again until the longest call is complete.

In **random** mode, after the initial start, each channel operates independently. Random mode generates the highest call generation rate.

To set the run mode, perform the following:

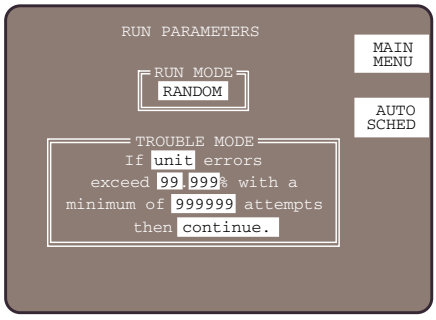
1. From the MAIN MENU, press **F3** (RUN PARAM). The unit displays the RUN PARAMETERS menu with the RUN MODE highlighted.
2. Use the **VALUE** keys to select RANDOM or SYNCH mode.

Related Control Commands	
RR	displays a listing of the current run and trouble mode settings.
TM m	where **m = 0** places the unit in random mode and **m = 1** places the unit in synchronous mode.

2.3.2 Setting the Trouble Mode Parameters

The Trouble Mode settings allow you to set the fault tolerance threshold of the AM2-D/De as well as the action that the unit initiates once the threshold is exceeded. You may set the threshold for single call errors or for total call errors but not both.

To set the trouble mode parameters, perform the following:



1. From the MAIN MENU, press **F3** (RUN PARAM). The unit displays the RUN PARAMETERS menu with the RUN MODE highlighted.
2. Use the field control keys to highlight the error type field and select **unit** or **call** errors using the VALUE keys. If you select **unit**, the AM2-D/De calculates the error thresholds based on all the calls received or generated by the unit. If you select **call**, the unit calculates the error thresholds based on the total errors of a single call.
3. Highlight the error percentage field, and enter an error threshold between 00.000 and 99.999.
4. Highlight the call attempts field and enter the number of calls that the threshold is based on from 0 to 999,999.

5. Highlight the action field and enter the action that the unit will take when the threshold is exceeded. The choices are **continue**, **stop call**, **stop unit**, or **act varies**.
    - **Continue** causes the unit to ignore all errors and continue testing.
    - **Stop Call** causes the unit to stop an in-progress call when the error threshold is met. You would normally use this action for errors calculated on a single call (when call is selected in error type field).
    - **Stop Unit** causes the unit to completely stop when the error threshold is met. You would normally use this action for errors calculated on all calls (when unit is selected in error type field).
    - **Act Varies** indicates the trouble mode has unique actions for both the call and the unit. Configuring these actions is accomplished via the CT remote command described in Section 5.

Note: When the unit stops on an error, the green LED above the **START** button and the red LED above the **FINISH** button alternately blink. The LED for the channel handling the call when the error threshold was met turns red.

Related Control Commands

RR displays a listing of the current run and trouble mode settings.
CT sets trouble mode parameters. See *Section 5, Command Reference* for details.

2.4 Starting & Stopping a Test

This subsection covers manually starting, halting, resuming, and stopping a Test. In the following descriptions **FCN>** means **FCN** followed by.

2.4.1 Starting or Resuming a Test

To start a test, press **FCN>START** when the **START/FINISH** LEDs are in one of the following three conditions:

1. **FINISH** LED solid red (**Unit Stopped**)
   When you press **FCN>START**, the unit:
   a. Requests a Set #.
   b. Reloads the Line Group Controller (LGC) anytime that you select a different set to run.
   c. Starts testing using the new settings, if any.
2. **FINISH** LED flashing (**Unit Halted**)
   The unit immediately resumes testing using the same set that was being run when testing was halted.
3. **START** and **FINISH** LED alternately flashing (**Unit Stopped on Error**)
   The unit immediately resumes testing using the same set that was being run when testing was halted.

Related Control Commands	
TS s	Starts set **s** where **s** is a Set in the range of 1 to 4 and returns a status message.
TR	Resumes a halted test and returns a status message.

2.4.2 Halting or Stopping Test

Halt (FINISH)

To stop a test in progress in an orderly fashion, or to temporarily halt a test in progress, press **FCN>FINISH**. The unit responds by completing any tests in progress. Unless an error occurs, the corresponding channel LEDs extinguish as the individual tests are completed.

STOP

To stop testing immediately, press **FCN>FINISH** a second time. If you press **FCN>FINISH** a second time before the unit has a chance to complete the tests in progress (orderly halt), all the channel LEDs extinguish, and the unit does not update the Call Statistics screen.

CAUTION: If you need to stop a test but want the unit to update the Call Statistics, pause long enough for the channel LEDs to extinguish between the first and second pressing of **FCN>FINISH**.

App Note: If you want to resume testing using the same setups as your previous test, then press **FCN>FINISH** one time (**halt**). If you want to change any channel assignments, testing parameters, call programs, or set assignments before restarting, press **FCN>FINISH** again (**stop**).

Related Control Commands

TF	Stops a test in progress in an orderly fashion and returns a status message.
TQ	Stops tests immediately and returns a status message.

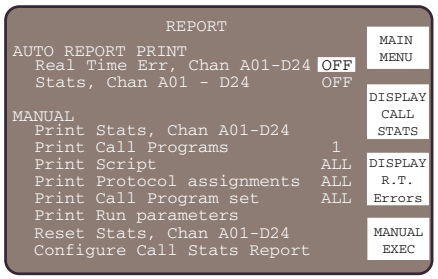
2.4.3 Automatically Scheduling Tests

In addition to manually starting and stopping tests, the unit also contains an Auto Schedule feature. Auto-scheduling allows you to program the test duration and the sequence in which call test sets will be tested. This feature is out of the scope of Getting Started. For details, refer to AUTO SCHEDULE in *Section 4, Screen Reference* or the **RR**, **TA**, **TP**, and **TC** commands in *Section 5, Command Reference*.

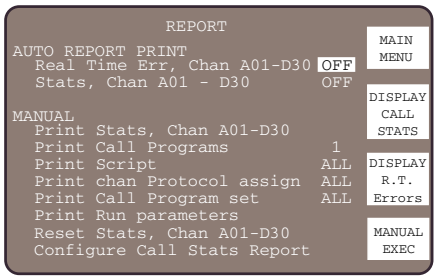
2.5 Test Results

Test results can be displayed on the LCD or ported via the RS-232/Ethernet connector to a printer or terminal. The AM2-D/De allows you to control certain report features. These features are controlled by the settings in the REPORT menu. REPORT menu features are covered in detail in *Section 4*, *Screen Reference*.

For the purposes of getting started, we will use the REPORT menu to access the CALL STATISTICS FORMAT configuration menu (⇩+**F4**), the STATISTICS DISPLAY menu (**F2**), and REAL-TIME ERROR DISPLAY (**F3**).



AM2-D



AM2-De

2.5.1 Setting Up the Call Statistics Options

The AM2-D/De displays call statistics in a tabular format similar to a spreadsheet. The unit displays the Call Statistics register either on demand or at programmed intervals that you specify.

You can enter up to 32 column headers from a list of headers, which may be selected from the cause codes in the assigned scripts.

To access the STATISTICS DISPLAY screen, perform the following:

From the MAIN MENU, press **F4** (REPORT). The unit displays the REPORT menu.

From the REPORT menu, press **F2** (DISPLAY CALL STATS). The unit displays the four left-most columns of the STATISTICS DISPLAY screen.

Selecting Column Headers (Stat Categories)

An AM2-D/De Call Statistics Report can contain up to 32 columns of data for up to 96 (AM2-D) or 120 (AM2-De) channels starting with column 1 on the left. Each channel is assigned an individual row in the listing. Column headers and the data accumulated in the columns are based on cause codes. Cause codes are script dependent. Cause codes for each of the factory-loaded scripts may be found in the appendices.

The following is a listing of common cause codes.

TITLE	#	TITLE	#
ORIG ATTMPT	1	NO CONFRM	8
ORIG COMPL	2	CALL BUSY	9
AVG START DELAY	3	NO ANS SIGNAL	10
SLOW START	4	TERM ATTMPT	11
NO START	5	TERM COMPL	12
NO ALERT	6	RING TIMOUT	13
AVG PD DELAY	7		

These codes are provided as an example to aid in setting up the headings for the Call Statistics Report. Again, the actual cause codes/headers that you choose for your Call Statistics Reports should reflect the cause codes found in the script(s) that you've chosen for your call program.

The factory default cause code settings for an AM2-D/De are as follows, starting with column 1 on the left: 1, 2, 11, 12, 5, 6, and 8. The following is a sample of a factory set report:

CHAN	ORIG ATTMPT	ORIG COMPL	TERM ATTMPT	TERM COMPL	NO START	NO ALERT	NO CONFRM
TTL	51	0	0	0	51	0	0
A01	6	0	0	0	6	0	0
A02	0	0	0	0	0	0	0
A03	6	0	0	0	6	0	0
.							
.							
A11	7	0	0	0	7	0	0

The unit's LCD can only display four columns of the Call Statistics report at a time. To see a complete report you need to press the ⇨ and ⇦ keys to scroll across the screen.

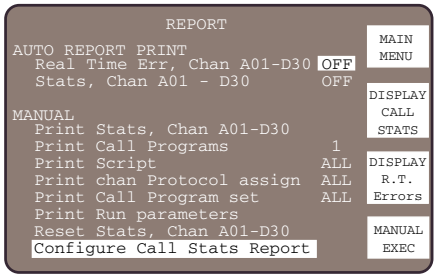
To view all the columns at once:

1. connect a printer or terminal to the RS-232/Ethernet port and set up the RS-232/Ethernet configuration accordingly.
2. from the REPORT menu, use the **FIELD CONTROL** keys to highlight Print Stats, Chan A01-D24 (AM2-D) or A01-D30 (AM2-De).
3. press **F4** (MANUAL EXEC).

Adding, Changing, or Deleting a Cause Code

To add, insert, change, or delete a Cause Code in a column heading, perform the following:

1. From the REPORT menu, use the **FIELD CONTROL** keys to highlight Configure Call Stats Report.
2. Press **F4** (MANUAL EXEC). The unit displays the CALL STATISTICS FORMAT screen.
3. Perform one of the following substeps.



Adding a Cause Code

Highlight the first zero in the CAUSE CODE column and replace the zero with the Cause Code number that you wish to add.

Note: In the FIELD SEQUENCE column, the lowest sequenced number (1) is the left most report column and the highest (32) is the right most.

As soon as you perform another action, such as highlighting another field, after adding, inserting, or replacing an existing cause code, the unit inserts the formal name for that cause code in the CAUSE NAME column.

Inserting a Cause Code Between Existing Codes

To insert a Cause Code:

a. Using the **FIELD CONTROL** down arrow, highlight the first zero that you come to as you scroll down the list and add the cause code number in the list that is displayed just above the zero.

b. Press the ⇧ key to move the cursor up one line and replace the existing cause code with the one in the line just above it.

c. Continue performing step b until you highlight the cause code in the position in which you want to insert the new cause code.

d. Replace the existing code with the new one.

Changing/Replacing a Cause Code

To replace an existing cause code with another:

Using the ⇧ and ⇩ keys, highlight the cause code that you wish to replace and enter a new cause code.

Deleting a Cause Code

To delete an existing cause code:

a. Highlight the cause code that you wish to delete.

b. Enter a zero.

Note: If you want to close up the gap created by deleting a cause code, enter the cause code number that is located just below the one that you are eliminating. Continue this process until each of the remaining cause codes are moved up one.

Related Control Commands

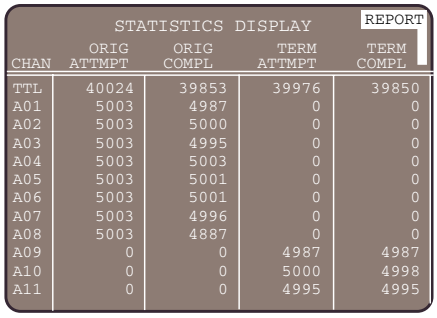
RF <col #> <cause code> Adds a cause code to a specific column in the Call Statistics report.

RF <col #> <0> Removes a cause code assignment from a specific column in the Call Statistics report.

2.5.2 Viewing Call Statistics

You may view the Call Statistics Registers in either of two screens: the STATISTICS DISPLAY screen or the CHANNEL MONITOR screen. The STATISTICS DISPLAY screen displays Call Statistics for one channel, a range of channels, or all channels. The CHANNEL MONITOR screen permits statistics viewing on only two channels; however, you can monitor the audio activity on the channels using the internal speaker or external headsets (non-CE units).

Accessing the Statistics Display Screen



STATISTICS DISPLAY REPORT

CHAN	ORIG ATTMPT	ORIG COMPL	TERM ATTMPT	TERM COMPL
TTL	40024	39853	39976	39850
A01	5003	4987	0	0
A02	5003	5000	0	0
A03	5003	4995	0	0
A04	5003	5003	0	0
A05	5003	5001	0	0
A06	5003	5001	0	0
A07	5003	4996	0	0
A08	5003	4887	0	0
A09	0	0	4987	4987
A10	0	0	5000	4998
A11	0	0	4995	4995

To access the STATISTICS DISPLAY screen perform the following:

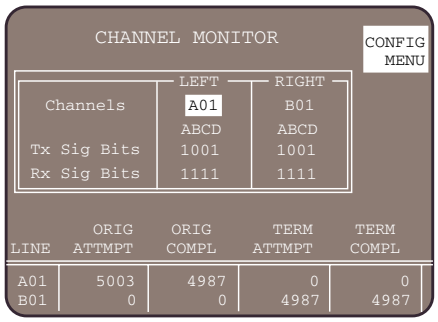
1. From the MAIN MENU press **F4** (REPORT). The unit displays the REPORT menu.
2. From the REPORT menu, press **F2** (DISPLY CALL STATS) to display the STATISTICS DISPLAY screen.

   The STATISTICS DISPLAY screen displays the register totals for all channels on the first data row followed by eleven rows of channel data.
3. To access more lines of data, press the ⇩ key.

Related Control Commands

RS ccc|ccc-ccc|ALL lists call statistics for channels **ccc** where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De) and **ALL** is all 96 (AM2-D) or 120 (AM2-De) channels.

Accessing the Channel Monitor Screen



To access CHANNEL MONITOR screen:

1. From the MAIN MENU press **F1** (CONFIG) to display the CONFIGURATION MISC menu.
2. From the CONFIGURATION MISC menu, press **F3** (CHAN MON). The unit displays the CHANNEL MONITOR screen.

2.5.3 Scheduled Listing of Call Statistics

The AM2-D/De can be scheduled to display or print Call Statistics at 15-minute, 30-minute, or hourly intervals via the RS-232 port. To set the schedule:

1. From the MAIN MENU press **F4** (REPORT). The unit displays the REPORT menu.
2. Using the **FIELD CONTROL** keys highlight the range field of the Stats, Chan xxx-xxx and enter the range of channels to appear in the report.
3. Press ⇨ and highlight the interval.
4. Press **VALUE** ∇ or Δ to select OFF, 1/4 hr, 1/2 hr, or 1 hr.

Related Control Commands

RP m ,ccc/ccc-ccc/ALL lists call statistics for channel **ccc** at interval **m**. When **m=0** scheduling is shut off. When **m=1**, the unit lists the call statistics for channel **ccc** every 15 minutes; **m=2**, every 30 minutes; or **m=3**, every hour.

2.5.4 Viewing Real-Time Error Reports

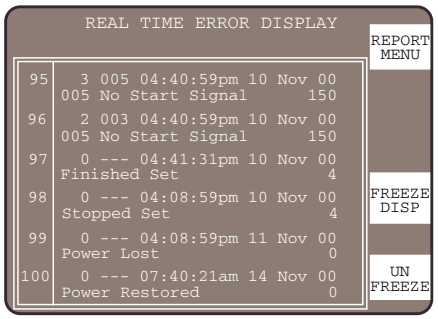
There are two ways to view errors: in real time, or by listing a log of the most recent 150 errors.

2.5.4.1 Viewing Errors As They Happen

To view errors as they happen, perform the following:

a. From the MAIN MENU, press **F4** (REPORT). The unit displays the REPORT menu.

b. Highlight OFF on the top line of the screen and press the **VALUE** ∇ key. The unit changes the entry to ON and begins logging errors as they are reported to the RS-232 or Ethernet port.



c. From the REPORT menu, press **F3** (DISPLY R.T. Errors). The unit displays each error as it occurs on the REAL TIME ERROR DISPLAY screen.

Note: Multiple error conditions occurring in a short timeframe cause the display to scroll rapidly, making it difficult to read. The display also may not be able to keep up. If either condition occurs, press **F3** (FREEZE DISPLAY). The unit allows you to view the most recent errors while continuing to store errors; however, only 150 of the most recent errors will be stored while the display is frozen, and these cannot be viewed until the screen is unfrozen. A screen message counts down as the last 50 errors fill the buffer. When the counter displays zero, the buffer stops storing new error messages and all new error messages are lost. After viewing, you can press **F4** (UNFREEZE) for the unit to again display the errors as they occur.

Related Control Commands	
RL 1	The RS-232 or Ethernet port lists each error as it occurs.
RL 0	The RS-232 or Ethernet port stops listing the errors as they occur. The most recent 150 occurrences, however, will be stored in the real-time error log.

2.5.4.2 Resetting Call Stats and the Real-Time Error Log

Once you've set up a Call Statistics Report, you need only reset the call statistics between tests. If you don't reset the report registers, the AM2-D/De will add the new statistics to the previous statistics. You may reset the report registers for a single channel, for a range of channels, or for all channels from either the REPORT menu or the STATISTICS DISPLAY screen.

Note: Resetting even a single channel of call statistics will clear the Real Time Error Log.

Resetting statistics from the REPORT menu

To reset the registers from the REPORT menu, perform the following:

a. From the MAIN MENU, press **F4** (REPORT). The unit displays the REPORT menu.

b. Use the **FIELD CONTROL** keys to highlight Reset Stats, Chan xxx-xxx.

c. Enter the channel range for the channel(s) that you want to reset.

d. Press **F4** (MANUAL EXEC).

Resetting statistics from the STATISTICS DISPLAY screen

To reset the registers from the STATISTICS DISPLAY screen:

a. From the MAIN MENU, press **F4** (REPORT). The unit displays the REPORT menu.

b. Press **F2**. The unit displays the STATISTICS DISPLAY screen.

c. Press the **DELETE** key. The unit displays the Range to Clear message window.

d. Using the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys, select the range of channel registers that you want to clear. To clear all channel registers, enter the range A01 to D24 (AM2-D) or A01 to D30 (AM2-De).

e. Using the **FIELD CONTROL** keys, highlight CLEAR and press **F1**.

Related Control Commands
RC ccc[-ccc]/ALL The unit resets the designated Call Statistics registers.

2.6 Online Help

The AM2-D/De provides you with three types of help:

- Screen Help - per most screens (**FCN>UNDO**)
- Control Command Syntax Help (Command Mode only)
- Topical Help - per keywords (Command Mode only)

2.6.1 Menu/Screen Help

You may access help for any menu/screen, at any time, by pressing **FCN** followed by **UNDO**. The unit displays the first of one-or-more screens of information about the selected menu/screen. If a menu/screen does not have a HELP screen associated with it, pressing **FCN>UNDO** will not display a HELP screen.

When a HELP screen is displayed, you can move forward to the next screen (if one exists) with the **F1** key or you can use the **F4** key to quit the HELP.

After the last HELP screen has been reached, either key will again display the screen that was displayed when HELP was selected.

2.6.2 Control Command Syntax Help *(Command Mode Only)*

? Lists all commands with their related syntax.

α? Lists only commands of the command type α, where α is the first letter of that command type, e.g. **m?** lists only the Miscellaneous Commands.

2.6.3 Topical Help *(Command Mode Only)*

MH ?..... List Index of AM2 Help Subjects.
MH <Topic>..... Lists Help for selected topic.

2.7 FeatureCall Getting Started

The Ameritec Corp. (P/N 240034) FeatureCall® is a PC-based Graphical User Interface that provides a simplified human interface to control an Ameritec Call Generator in either a system test environment, or as the control of a single test instrument.

FeatureCall is a Microsoft® Windows® based application that runs on a personal computer with a 486 or higher microprocessor. It allows you to configure units, transfer files, control test sequences, request data, and generate reports. A test environment can be created over an Ethernet® TCP/IP LAN or an RS-232 serial system to test your equipment by running sets of scripted Call Programs controlled by Protocols.

The Getting Started section is task oriented. The presentation order is generally the order in which you perform the tasks. The majority of the FeatureCall functions that you will be performing are presented in this section. Some features are not needed for the basic operations and are covered elsewhere. These features, shown in Chapter 4 of the FeatureCall manual, include items such as Auto Scheduling of Tests and outputting listings from the Report menu.

FeatureCall includes the FirstCall™ Wizard. The Wizard provides step-by-step instructions for setting up your first Call Test Set.

2.8 System Testing

FeatureCall creates a test environment on an Ethernet® or RS-232 system, and provides workstation control for Ameritec call generators.

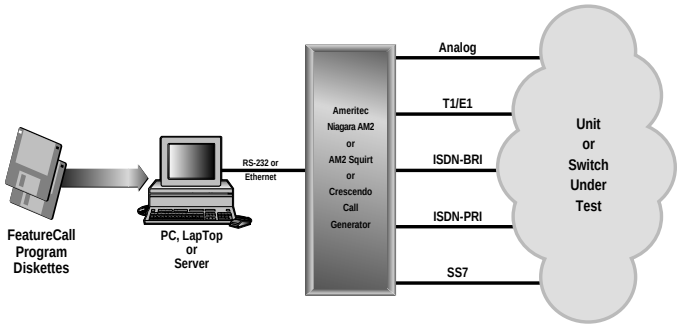
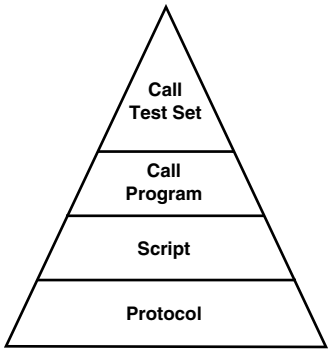


Figure 2-1. System Test Equipment Setup

There are four basic building blocks used to generate multiple calls on a Call Generator:

- A **Protocol** defines how the Call Generator communications channels respond to stimuli (Events). Each Protocol consists of a Protocol State Table (PST). The PST contains the rules of engagement between the Call Program, the Protocol State Machine (PSM), and the Line Interface. The rules of engagement define the signal(s) the PSM sends in response to specific events. Your unit shipped with one or more Protocols installed.



- A **Script** is a text file with specialized syntax that forms the template for the unit to follow when it originates or terminates a call. Your unit shipped with one or more Script files installed.
- A **Call Program** is a program that assigns user and default parameters; such as call channels and phone numbers, to a selected Script.
- A **Call Test Set** is a collection of Call Programs executed as a test in run mode. Each Call Program is based on one Script, and a Call Test Set may contain many Call Programs. Call Programs within each Set may be individually enabled or disabled without removing them from the Set.

Establishing an automated call is accomplished by:

- assigning a Protocol to a specific line number
- assigning a Script to a numbered Call Program
- assigning values to the Call Program's parameters
- assigning Call Programs to Call Test Sets

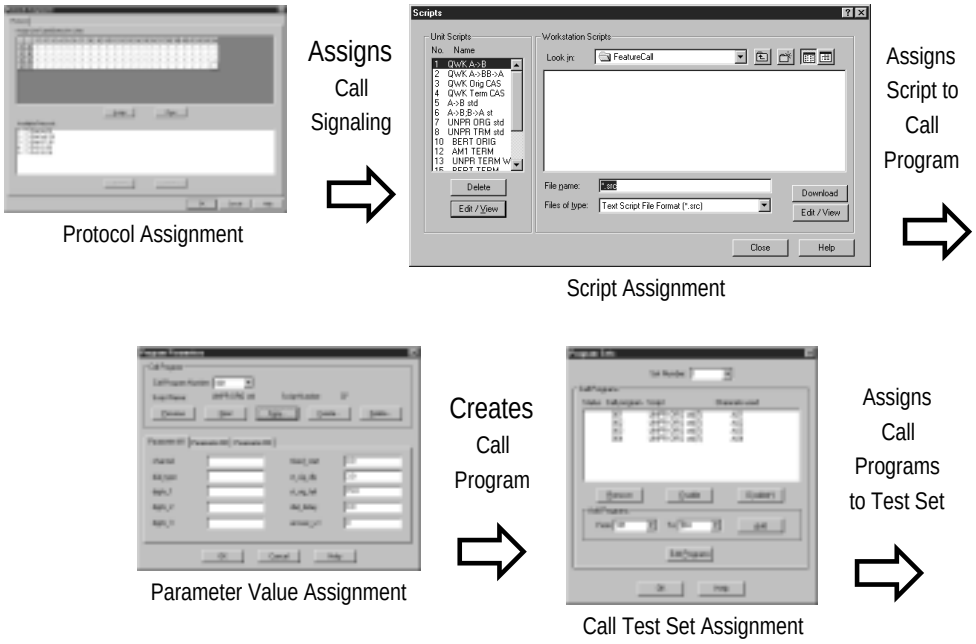


Figure 2-2. System Call Test Setup

2.9 Test Setup Procedures

To run a test:

- open FeatureCall
- configure the AM2-D/De
- access FirstCall
- assign Line Type configurations and protocols via FirstCall
- select the Call Program Script and Set via FirstCall
- create a Call Program and enter the program variables via FirstCall
- run the Call Test Set and view the results via FirstCall

2.9.1 Open FeatureCall

- Start Microsoft Windows.
- Double-click on the Ameritec Program Group. The system displays the FeatureCall Icon.

Double-click on the FeatureCall icon. The system momentarily displays the Copyright Screen, followed by the FeatureCall Explorer window with the **FeatureCall System Directory** highlighted and opened.

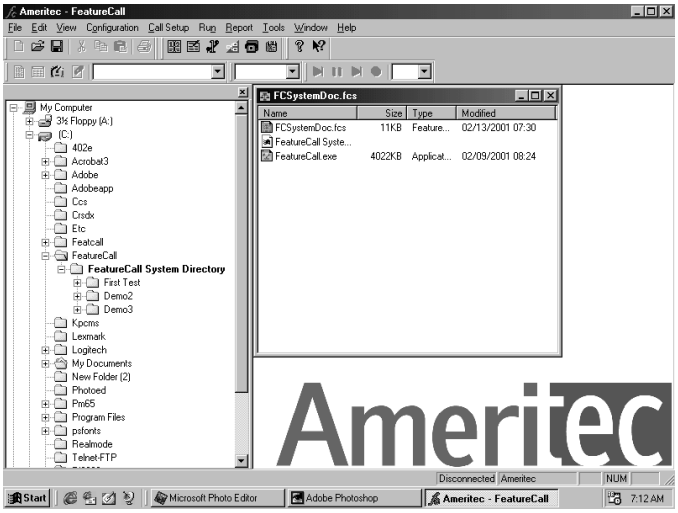


Figure 2-3. FeatureCall Explorer Window

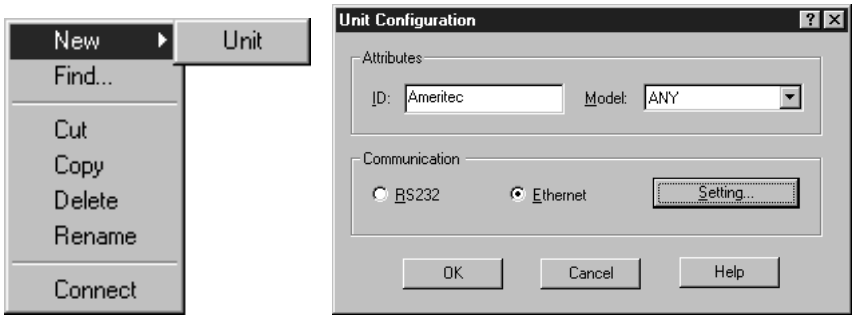
2.9.2 Configure the AM2-D/De

Call generators may be connected either across the RS-232 port or by a Telnet connection. A system may be comprised of a single unit, connected via RS-232 or Ethernet, or it may be a group of Ethernet-ready units on a TCP/IP network (LAN or WAN). To add a new system:

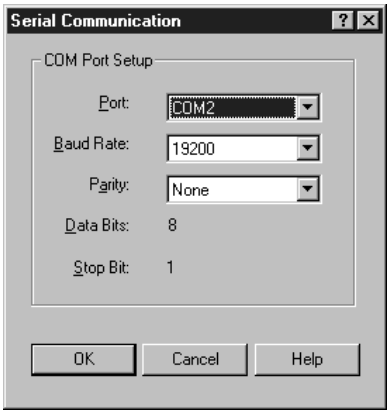
1. Right-click on the **FeatureCall System Directory**, select **New** to display the **System** prompt, then click on **System** to add a **New System** folder to the **FeatureCall System Directory**.

To add a new unit:

1. Right-click on the **New System** folder, and select **New** to display the **Unit** prompt. Click on New to display the Unit Configuration screen.



2. In the **Attributes** section, in the **ID** window, type in the name by which you want the unit addressed, i.e., **Ameritec**.
3. In the **Attributes** section, in the **Model** window, select the type of unit to which you want **Ameritec** to connect from the drop-down list.
4. The **Communications** section allows you to select RS-232 or Ethernet connectivity. For a Serial connection, select **RS232** and click on **Setting**. The **Serial Communication** screen is displayed.

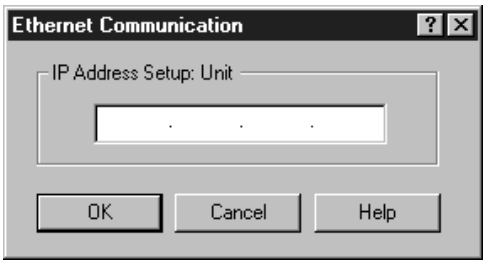


   a. Display the **Port** drop-down list in the **COM Port Setup** section. Select a COM port for connection.

b. Display the **Baud Rate** drop-down list in the **COM Port Setup** section. Select a Baud Rate for serial communication.

c. Display the **Parity** drop-down list in the **COM Port Setup** section. Select the parity for serial communication.

5. For an Ethernet connection, select **Ethernet** and click on **Setting**. The **Ethernet Communication** screen is displayed.

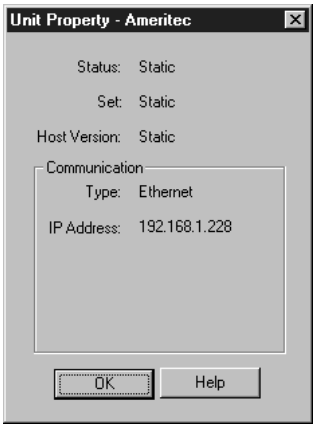


a. Type the IP Address into the **IP Address Setup: Unit** field and click **OK**.

Right-click on the new unit folder (i.e., **Ameritec**) to display the unit menu.

- **Connect** provides communication between the program and the selected unit. This permits the selected unit (i.e., **Ameritec**) to be operated via the FeatureCall GUI.
- **Config Connection** displays the Unit Configuration screen previously described.
- **Cut** removes the selected system/unit and stores it on the clipboard.
- **Copy** copies the selected system/unit and stores it on the clipboard.
- **Delete** removes the selected unit from the system.

- **Rename** allows you to changes the name of the selected system unit.
- **Properties** displays a screen listing the properties of the selected system unit.



When a connection is made to the call generator:

- The red symbol and bar across the unit symbol is replaced with a red down arrow on the unit symbol.
- **Scripts**, **Protocol**, **Call Programs**, and **Test Sets** folders are displayed beneath the unit folder
- The **Standard Report Page** and **Unit** name are displayed in the **Tool Bar**.
- The **Run**, **Finish**, **Resume**, and **Stop** buttons located on the **Tool Bar** are enabled.
- **CONNECTED** is displayed in the **Status Bar**.

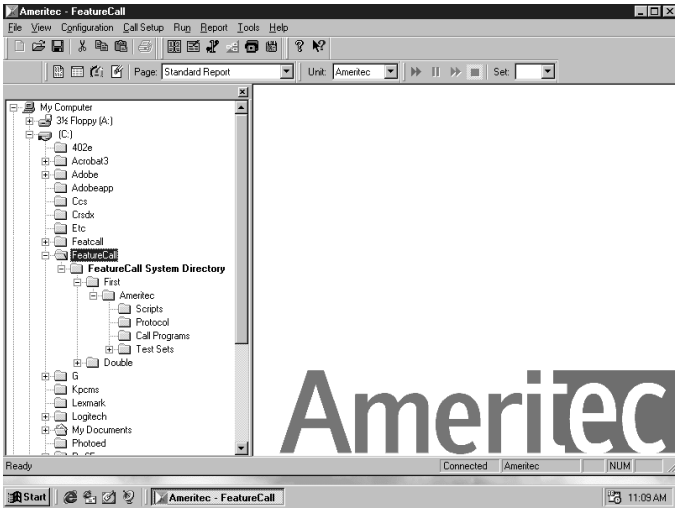


Figure 2-4. FeatureCall Main Window

2.9.2.1 PCM Mode Parameter Entry

Call generators that utilize PCM (T1 or E1) require that the PCM mode be set up properly. To set up PCM Mode:

1. From the FeatureCall Explorer Window, click on **Configuration**. The **Configuration** menu is displayed.
2. Select **PCM Mode**. The system displays the **PCM Mode Configuration** screen.

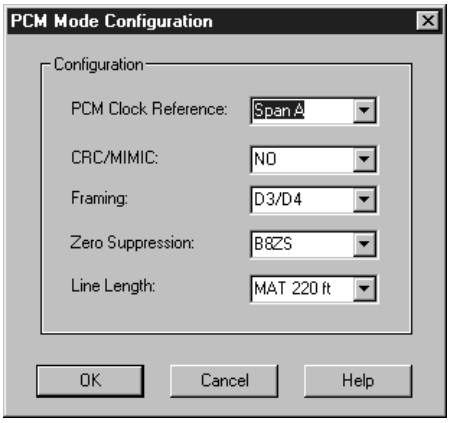


Figure 2-5. PCM Mode Configuration Screen

The **PCM Mode Configuration** screen allows you to set the following T1 or E1 line parameters.

- **PCM Clock Reference** sets the source of the PCM clocking. PCM clock source selection typically depends upon the nature of the unit. For network testing with a network clock, span-based is typically selected.

  For loop-back testing and tests where the unit is acting as the network (and as the network clock) internal PCM clocking is recommended.

  For tests where multiple units are acting as the network (and the network clock), external PCM clocking is used to synchronize all units to the same PCM clock. One unit should be set to **Internal** clocking (the clock master) while all other units should be set to **External**. All **External** clock units receive their clock reference from their audio monitor span inputs.

  - **Internal** originates within the call generator and is presented with the signal at the LINE TX connectors.
  - **External** extracts the clocking signal from the Audio Monitor interface. Typically, the Audio Monitor interface will be connected to an Ameritec Audio Monitor Sync Box that can supply a common PCM source for multiple units. If there is no Line Monitor option, or valid PCM input, the unit defaults to **Internal** clocking. If the selection is not available due to the presence of older Host Firmware, selecting this source will generate a command error message.
  - **Span A**, **B**, **C**, **D**, **E**, or **F** extracts the clocking signal from the unit under test via the LINE RX connector for the selected span. Spans **E** and **F** are only available on Call Generators capable of supporting SS7 operation, and may not be available on all SS7 units. If the selection is not available on the Host Firmware, selecting this source will generate a command error message.
- **CRC/MIMIC** selects whether CRC/MIMIC checking is **ON** or **OFF**. The setting must match the CRC/MIMIC setting of the equipment under test. When **ON**, CRC checking is performed on PCM lines with ESF framing, and MIMIC is performed on PCM lines with D3/D4 framing.

- **Framing** selects the Span framing for the tested circuit (T1 only)
  - **D3/D4** uses 12 separate frames in a "super-frame". The signaling bits are "a" and "b".
  - **ESF** (Extended Super Frame) uses 24 frames in a "super-frame". The signaling bits are "a", "b", "c" and "d".
- **Zero Suppression** determines the PCM line handling of a data pattern of all "0's" during transmission (T1 only).
  - **B8ZS** (Binary Eight Zero Suppression) inserts two bipolar violations when it sees eight consecutive "0's". The receiving equipment recognizes this and removes the BPVs.
  - **ZCS** (Zero Code Suppression) inserts a "1" bit to prevent the transmission of eight or more consecutive "0" bits.
  - **AMI** (Alternative Mark Inversion) alternates ones; that is, the first one is positive, the second negative, and so on. It is the basis for B8ZS and ZCS, but does not supply zero suppression conversions.
- **Line Length** selects the **Cable Type** and **Line Length**. Several line lengths are available for the different cable types (T1 only).

2.10 Making Your First Call

FeatureCall includes the FirstCall™ Wizard. The Wizard provides step-by-step instructions for setting up your first Call Test Set. It streamlines and eases the process of creating tests, including assigning protocols or line types, creating call programs, and assigning parameter values.

Six screens help in setting up the four basic building blocks (Protocols, Scripts, Call Programs, and Call Test Sets) used by a call generator when it tests your equipment:

- The first window is the introduction screen, which provides general information on what is required in the unit prior to starting the process.
- The second window, **FirstCall Wizard Line Types and Protocols**, is used to assign the desired line type configurations or protocol assignments to the lines or channels in the unit.

- The third window, **FirstCall Wizard Script Selection**, allows the assignment of one or two scripts for use in the Call Test Set. It also allows selection of the set number, which determines the range of Call Program numbers to be created by the Wizard.
- The fourth and fifth windows, **FirstCall Wizard Call Programs** (one for each Script selected), present an easy, intuitive way to assign all required parameters to the call programs. Only those parameters in the Script which have no default values are displayed, thus minimizing the amount of variable fields that need to be defined.
- The display of the sixth (and last) window, **FirstCall Wizard Finish**, indicates that the test creation process is complete. It also allows you to select whether or not to immediately run the new test.

To access **FirstCall**, click on the **FirstCall Wizard** icon on the **Tool Bar**, or click on **Tools** in the menu bar, then click on **FirstCall Wizard**. **FeatureCall FirstCall Wizard - Step 1** is displayed. It gives general information on what is required of the call generator prior to starting the process.

Figure 2-6. FirstCall Wizard Introduction

FirstCall requirements include having the scripts and protocols that you want to use for testing loaded into the unit. The factory scripts and protocols typical for your application are loaded on the call generator.

Note: To check Protocols, click **Next>**. **FeatureCall FirstCall Wizard - Step 2** shows you the Protocols loaded into the call generator. To check Scripts, click **Next>**, use **<Back** to return. **FeatureCall FirstCall Wizard - Step 3** shows you the Scripts loaded into the call generator.

There are a number of command buttons at the bottom of every screen, which control navigation through **FirstCall**. The **Next>** and **<Back** buttons shift control through each setup screen. Use the **Next>** button to go to the next screen. Use the **<Back** button to go back to the previous screen. Use the **Cancel** button to quit the wizard without leaving any changes in the unit. The **Help** button assists you in operating the screen on which it is located.

2.10.1 Assign Line Type Configurations and Protocols

Click on **Next>**. **FeatureCall FirstCall Wizard - Step 2** is displayed. It assigns the line type configurations and protocols to the lines or channels for Analog, Basic Rate ISDN (BRI), P-Phone, Digital, Primary Rate ISDN (PRI), and Signaling System 7 (SS7) call generators.

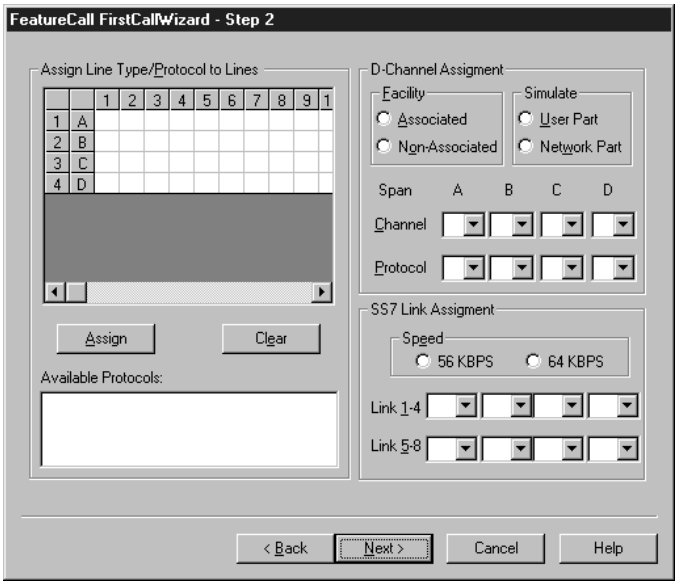


Figure 2-7. FirstCall Wizard Line Assignment

The **Assign Line Type/Protocol to Lines** grid displays all the assignments of each line for call generators. A list of the available line types is visible in the **Available Protocols** list.

- To change or make an assignment, select the new **Line Type** from the **Available Protocol** list, then highlight the line numbers in the grid that you want to use this new setting. Click **Assign** to complete the new assignment.
- To remove an assignment, highlight the line (by clicking the cell) or group of lines (by clicking and dragging the mouse over the desired range of cells), then click **Clear**.

If there are no entries in the list, exit the FirstCall Wizard and use the **Download Files to Unit** command (discussed in Chapter 4, Navigating through the Main Window) to load a protocol off the Ameritec Factory Scripts and Protocols diskette or from the PC hard drive.

To select a line to modify, click on the cell you wish to edit. To select an entire column, click the top-most cell in any column. This highlights all the cells under it. To select an entire row, click the left-most cell. Select the entire grid by clicking the upper left-hand corner cell.

2.10.2 Select the Call Program Script and Set

Click on **Next>**. **FeatureCall FirstCall Wizard - Step 3** is displayed. It selects the scripts used to create Call Test Sets. Select either one of two scripts and the set. Each set dedicates a range of call programs for program creation. Sets one and two each provide up to 100 call programs, set three 120 programs, and set four, a full 160 programs. The range of call programs is defined for each set.

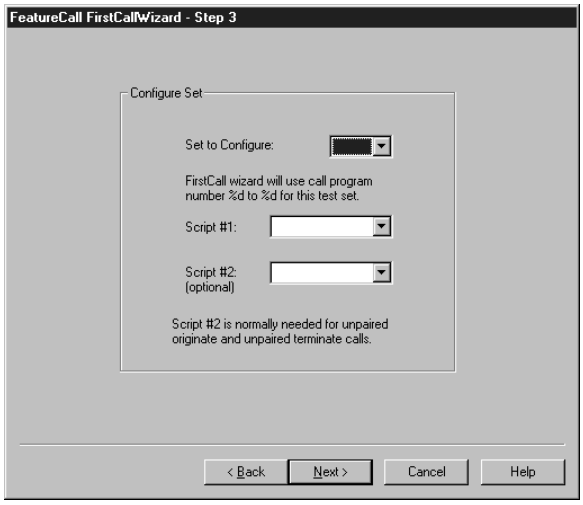


Figure 2-8. FirstCall Wizard Script Selection

- **Set to Configure** selects the set number and the range of programs used by the Wizard to create the new test.

> **Caution:** The call program range defined is created when **Finish** is clicked. This overwrites existing programs in the range. If the existing setup is important, a Set Backup should be performed first.

- **Script #1** lists the scripts in the call generator. The script selected is used to create the call programs in the test set.
- **Script #2** lists the scripts in the call generator. The script selected is used to create additional call programs in the test set.

2.10.3 Create a Call Program and Enter the Program Variables

Click on **Next>**. **FeatureCall FirstCall Wizard - Step 4** is displayed. It creates a call program based on **Script #1**. It has two major components; the parameter grid, and the program editing buttons. Use the buttons to create a call program, then click the Add Program button. Once a program is created, you must enter all its values.

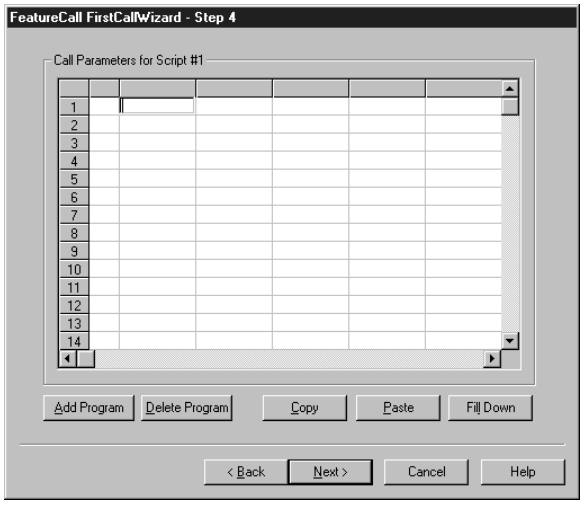


Figure 2-9. FirstCall Wizard Variable Entry

The names of all the call program variables in the script that have no default values are shown in the grid. You must enter these values for each call program.

Use the **Delete Program** button to remove call programs. The edit buttons **Copy**, **Paste**, and **Fill Down** all assist in assigning parameter values. Clicking the right mouse button allows you to move from one edit button to another quickly and easily.

- The **Call Parameters for Script #1** grid contains the call programs and their parameter values. To edit the contents of a cell, click or use the arrow keys to select the cell, then type the desired values into the cell. You can also use the Tab key to navigate through the grid. A call program is selected by clicking on the entry number on the far-left column of the grid. This highlights the parameters of a program. Use **Delete Program**, **Copy**, and **Paste** to edit the highlighted values.

  To choose a column of values, click on the column title, then use the **Copy**, **Paste**, or **Fill Down** commands to edit the values in that column. By clicking on a cell, holding down the mouse button, and dragging, you can select any number of cells for editing.

- **Program Editing** uses five buttons (**Add Program**, **Delete Program**, **Copy**, **Paste**, and **Fill Down**) to edit the call program's parameter values.
    - **Add Program** inserts a new call program. If no program is highlighted, the new program is added to the end of the list. If a range of programs is selected, an identical number of call programs are created. To create multiple programs, highlight the desired range of programs.
    - **Delete Program** deletes the selected call programs. If no program is selected, no action is taken.
    - **Copy** copies the selected cell value(s) into a buffer. The paste operation can then replace any selected cell with the contents that were copied.
    - **Paste** enters the data copied into the buffer into the selected cell(s).
    - **Fill Down** fills all the selected values in a column based on the first two highlighted values in the column. If the first two values are the same, the same value is entered into all the selected cells in the column. If the values differ, the numbers determine the value by which the rest of the fields are incremented. A simple difference is performed, then applied to each value entered into the grid.

2.10.3.1 Select a Call Program Script

To assign a Script to a Call Program, you may also access the **Program Parameters** menu by selecting **Call Programs** from the **Call Setup** menu. When the Program Parameters menu is displayed, select **Create Programs** from the Call Program section of the screen.

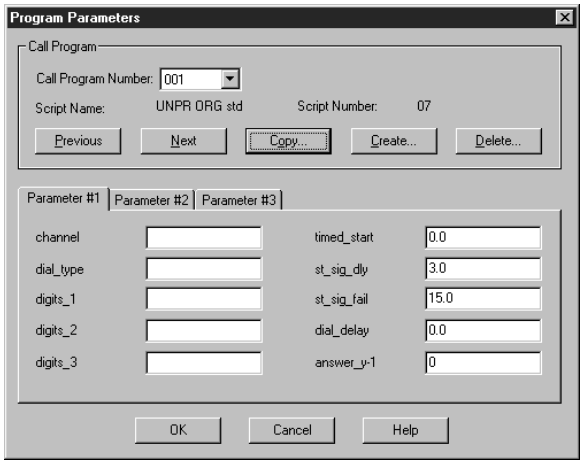


Figure 2-10. Program Parameters

Create Program displays a **Create New Call Programs** dialog box from which you may select a range of call programs (up to 480) to create.

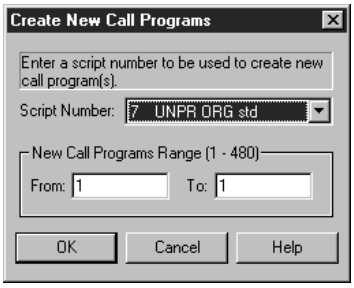


Figure 2-11. Create New Call Programs

Select a Call Program Script from the **Script #** drop down list. Click **OK** to assign the selected script (**A>B std**) to Call Programs 1-25.

2.10.3.1.1 Assign Variables to the Call Program Script

Call Program Number allows you to select a call program in the connected call generator to be displayed. The **Script Name** and **Script Number** fields describe the script displayed in the Call Program Number box. The tabs in the bottom half of the screen contain variables assigned to the displayed Call Program Number. You can edit each of the Parameter fields to change the variables they contain.

Copy Call Programs by clicking on the **Copy** button to display a **Copy Parameters** menu. You can select values to copy and target one or more call programs to receive them.

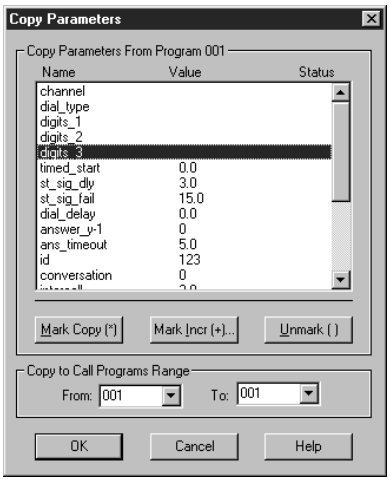


Figure 2-12. Copy Parameters

The Copy Parameters menu lists the selected Call Program's values. The **Copy to Call Programs** boxes specify the range of programs to which values are to be copied. To select a value, highlight it and click on **Mark Copy (*)** or **Mark Incr (+)**.

- **Mark Copy (*)** specifies that a value is to be copied to other call programs as-is. An asterisk in the **Status** column means a value is to be copied as a mark copy.
- **Mark Incr (+)...** specifies that a value is to be copied to other call programs incrementally. **Mark Increment** defines the specifics of the copy. A plus sign is shown in the **Status** column to show that a value is to be copied incrementally.

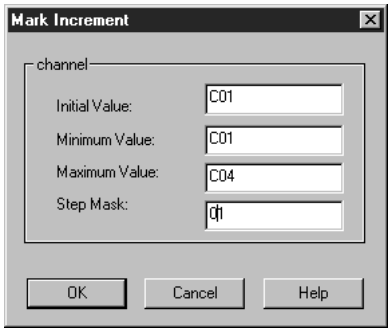


Figure 2-13. Mark Increment

- **Initial Value** defines the initial value for incrementing the parameter. It is required that the starting value be a number that exists between the minimum and maximum range parameter. If the starting value is outside these boundaries, an **Invalid Value** message is displayed.
- **Minimum Value** defines the minimum value of the increment range. The minimum value must be the lower of the two value fields.

  Example: If the intent is to incrementally copy a value with a range of +10 to –10 with an initial value of 10 and a Step Mask of -1, the minimum value shall be -10 and the maximum value shall be +10.

  Note: Negative values are only allowed on parameters that support signed values. If a signed value is inadvertently entered where signed values are not allowed, the copy program generates an **Invalid Value Entry** message.

- **Maximum Value** defines the maximum value of the increment range. Once this value has been exceeded, the next increment is to the minimum value. This continues to occur until all designated call programs have had their flagged values incremented.

- **Step Mask** defines the increment value to be used in creating the call programs. Incrementing digits is accomplished in a manner different from that of incrementing other parameters.

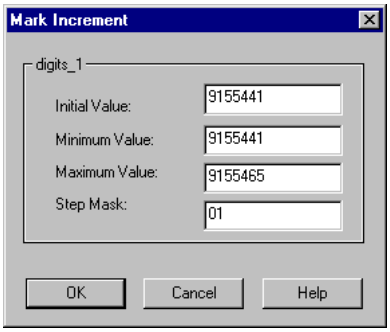


Figure 2-14. Step Mask

Incrementing Non-digits

When incrementing any parameter other than a digit field, the Step Mask need only reflect the desired increment value. There is no need for placeholders in the tens and hundreds column.

Example: To increment channels with a value of 1 for a range of A01 through B24, the Step Mask value should be 1. It is not required to set the Step Mask value to 01.

Incrementing Digits

1. Incrementing the digit field requires that you define the number of places, or range of digits, that the Step Mask will affect.
2. A digit field is incremented beginning in the one's column and continues from right-to-left based on the number of columns defined by the Step Mask.
3. The Step Mask only increments digits. If the digit fields contains a letter or symbol (f, p, w, t, *, or #), the Step Mask will not extend beyond the letter. In the example below, only the digits to the right of the letter or symbol are incremented. Care should be taken in defining the Step Mask.

The example includes incrementing the wait parameter to the right of the "w", as well as the three digits.

Example:

Initial value	12345w2001
Minimum value	12345w2001
Maximum value	12345w2999
Step mask	0002

In the following example, an attempt is being made to increment a digit field with a step mask of 01. The goal is to increment successive numbers between 400 and 500 by 1.

In the example, the actual value the algorithm will attempt to increment has a minimum value of 00 and a maximum value of 00. Since there is no actual range, all subsequent values will be 00. To properly increment the parameter, set a step mask of 001, or set the maximum value at 599. In either case, the digit field would be properly incremented.

Example:

Initial value	91554400
Minimum value	91554400
Maximum value	91554500
Step mask	01

Click on **Next>**. **FirstCall Wizard Page 5 of 6** is displayed. If a Script is selected for Script #2, it creates a Call Program based on Script #2 in the same manner as **FirstCall Wizard Page 4 of 6** does for Script #1. If (None) is selected for Script #2, **FirstCall Wizard Page 5 of 6** displays a message indicating that no script was selected.

2.10.4 Run the Call Test Set and View the Results

Click on **Next>**. **FeatureCall FirstCall Wizard - Step 5** is displayed. Use this screen choose whether to run the test immediately, or to run it at a later time.

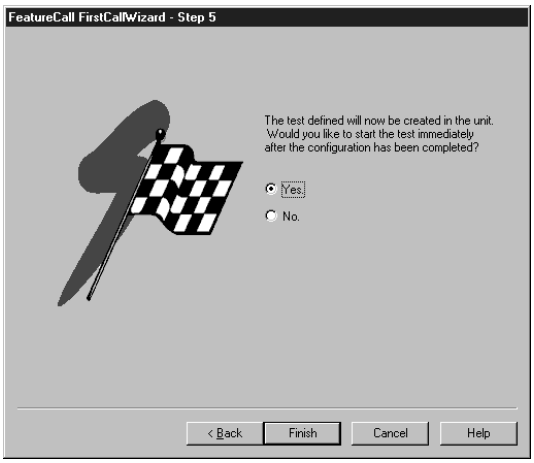


Figure 2-15. FirstCall Wizard Finish

To **create a test set** that contains the values that you entered in the preceding screens, click on **Finish**. A flood bar is displayed, showing how much of the creation process is complete and giving an estimate of how much time remains.

To **immediately run the new set** once it is created, click on **Yes**. If you select **No**, Set 1-4 does not run until it is selected from the **Tool Bar** and receives a **Start** command.

If you selected **Yes**, the set begins running as soon as it is created. The **Gauges** and the **Realtime Error Report** screens open so you can observe the test as it progresses.

As you become a more advanced user, try setting up and running Call Programs using the Call Setup menu.

2.11 Managing Unit Files

The FeatureCall window provides you with a simple-to-use method of managing unit files, Call Programs, Test Sets, Scripts, and Protocols. It also gives you the option of copying various unit files, and even units themselves, within a system configuration.

The right-click option on the mouse provides you with the ability to alter system configurations, unit files, and the details of individual Call Programs when the unit is in idle, or even while it is running. This is accomplished by the use of menus that are displayed when you right-click on the selected unit **Scripts**, **Protocol**, **Call Programs**, and **Test Sets** folders displayed in the window.

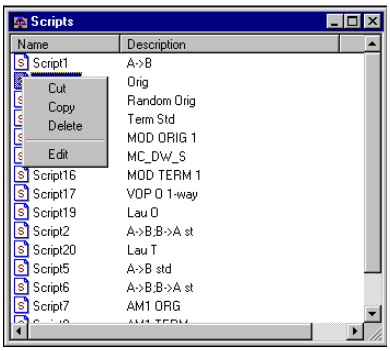
Transferring information from one unit to another is as simple as opening one unit's folder (i.e., **Scripts**), copying information there, opening a second unit's folder (i.e., **Scripts**) and pasting the information into it.

Note: Be sure that you want to take the action that you designate for the program to perform. **UNDO** is not an available option.

2.11.1 Managing Scripts

Left click on the **Scripts** folder associated with the unit of interest to display the list of Scripts resident in the unit.

Right click on the script of interest to display the following menu selections:



Cut Cut removes the selected script from the Unit list and places it on the clipboard.

Copy Copy copies the script onto the clipboard, but does not remove it from the Unit list or from the **Scripts** folder.

Delete Removes the selected script from the **Scripts** folder

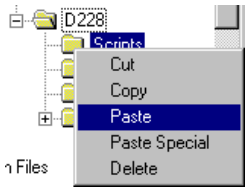
Edit A Save As screen is displayed. Click on Save. The selected script is added to the list and the script text is displayed. Double-clicking on a script will also open the Save As dialog.

Note: When a Script is cut or deleted, all Call Programs associated with the Script are deleted. When you paste the Script into another unit folder, only the Script is saved.

When you copy a Script from one folder to another, it moves only the Script.

If you want to move selected Call programs, or a complete Set of Call Programs, refer to ¶2.3.3 or ¶2.3.4.

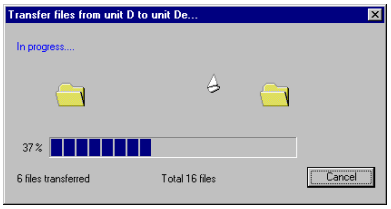
Right click on the **Scripts** folder to display a menu with the following selections:



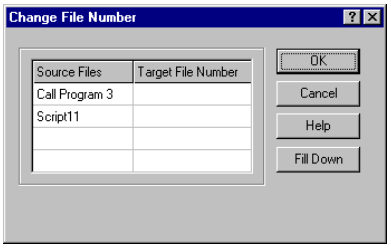
Cut Cut moves the selected script(s) from the Unit list and places it on the clipboard.

Copy Copy copies the script(s) onto the clipboard, but does not remove it from the Unit list or from the **Scripts** folder.

Paste Paste inserts a copy of the clipboard contents (script) into the selected unit's **Scripts** folder.



Paste Special Paste Special allows you to change the file name and number of a copied file before pasting it into a new location.



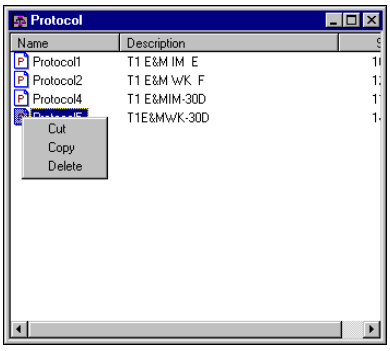
Delete Removes the selected script from the Unit list as well as from the **Scripts** folder and places it on the clipboard.

2.11.2 Managing Protocols

Left click on the **Protocol** folder associated with the unit of interest to display the list of Protocols resident in the unit.

Note: The content of the Protocol cannot be viewed or edited from FeatureCall. Viewing and editing Protocols requires Ameritec's protocol development tool, which is a separate application.

Right click on the Protocol of interest to display a menu with the following selections:



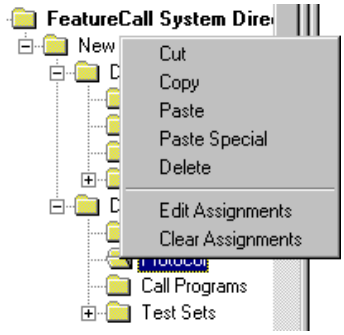
Cut Cut removes the selected protocol from the **Protocol** folder and places it on the clipboard.

Copy Copy copies the protocol onto the clipboard, without removing it from the **Protocol** folder.

Delete Removes the selected protocol from the **Protocol** folder.

Moving the Protocol to a New Location

Having selected **Copy** in the previous menu, select the Protocol folder in the list view, then right click on the folder to display a menu with the following selections:



Cut Cut removes the selected protocol from the **Protocol** folder and places it on the clipboard.

Copy Copy copies the protocol onto the clipboard, without removing it from the **Protocol** folder.

Paste Paste allows you to assign a previously copied or cut protocol into a different line/channel.

Paste Special Paste Special allows you to change the file name and number of a copied file before pasting it into a new location.

Delete Removes the selected protocol from the **Protocol** folder.

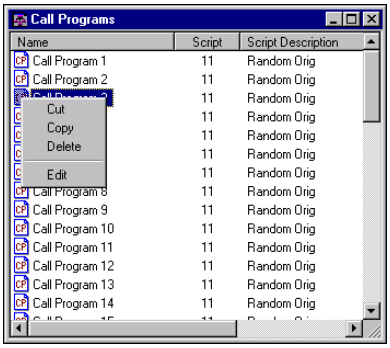
Edit Assignments Select Edit Assignments to display the **Protocol Assignment Menu**, which will allow you to assign protocols to the required lines/channels.

Clear Assignments Select Clear Assignments to remove assigned protocols from all lines/channels.

2.11.3 Managing Call Programs

Left click on the **Call Programs** folder associated with the unit of interest to display the list of the unit's call programs.

Right click on the call program of interest to display a menu with the following selections:



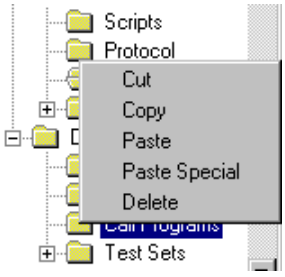
Cut Cut removes the selected call program from the **Call Programs** folder and places it on the clipboard.

Copy Copy copies the selected call program and places it onto the clipboard, without removing it from the **Call Programs** folder.

Delete Removes the selected call program from the **Call Programs** folder.

Edit Select **Edit Program** to display the **Program Parameters Menu**. This menu allows you to change a call program's parameters. Double-clicking on the call program of interest also displays the Program Parameters Menu.

Right click on the **Call Programs** folder to display a menu with the following selections:

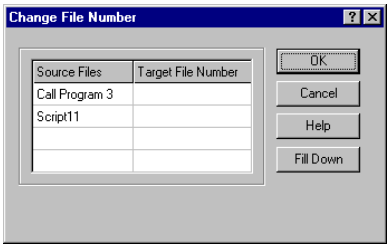


Cut Cut removes the selected call program from the **Call Programs** folder and places it on the clipboard.

Copy Copy copies the selected call program and places it onto the clipboard, without removing it from the **Call Programs** folder.

Paste Paste allows you to place a previously copied or cut call program into a different call test set.

Paste Special Paste Special allows you to change the file name and number of a copied file before pasting it into a new location.



Delete Removes the selected call program from the **Call Programs** folder.

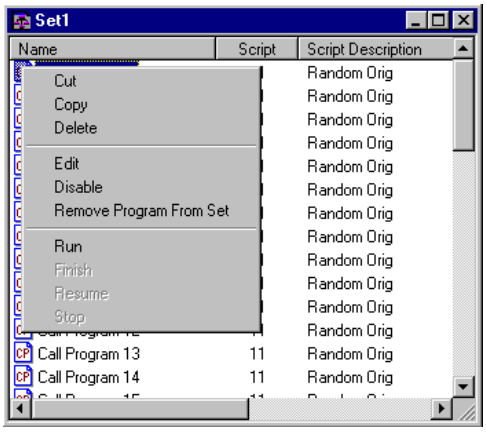
2.11.4 Managing Test Sets

Left click on the **Test Sets** folder associated with the unit of interest to display folders for each of the unit's four test sets.

Left click on a specific set folder (Set 1 through Set 4) to display a list of call programs contained within that set.

Double-click on the call program of interest to display the Program Parameters Menu. This menu allows you to make changes in the selected call program.

Right click on the call program of interest to display a menu with the following selections:



Cut Cut removes the selected call program from the call test set and places it on the clipboard.

Copy Copy copies the selected call program and places it onto the clipboard, without removing it from the call test set.

Delete Removes the selected call program from the call test set.

Edit Select Edit to display the Program Parameters Menu. This menu allows you to change a call program's parameters. Double-clicking on the call program of interest also displays the Program Parameters Menu.

Enable Enable enables a highlighted call program in the displayed set.

Disable Disable disables a call program in the displayed set.

Remove Program From Set Removes the designated call program from the selected call test set.

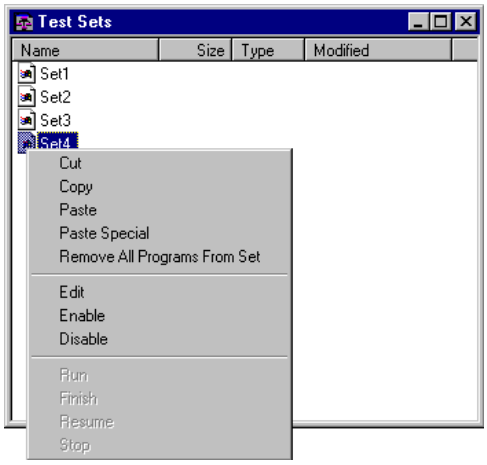
Run Run starts the selected call test set and displays the most recent system statistics accumulated in the connected unit. It operates in the same manner as the **Start** button on the **Tool Bar**. The **Status Bar** displays **RUNNING SET X**. This command is only valid when the status is **STOPPED** (no test running).

Finish Finish brings the testing of the set to an orderly conclusion. The **Status Bar** displays **FINISHED** after you click Finish.

Resume Resume continues running a **FINISHED** call program. New statistics are added to the old ones. The **Status Bar** displays **RUNNING SET X** when you click Resume.

Stop Stop stops running the call test set immediately. It also resets the report statistics. The **Status Bar** displays **STOPPED**. When you perform Stop prior to Finish, call programs may not report all events for calls in progress.

Right click on a specific set folder (Set 1 through Set 4) to display a menu with the following selections:

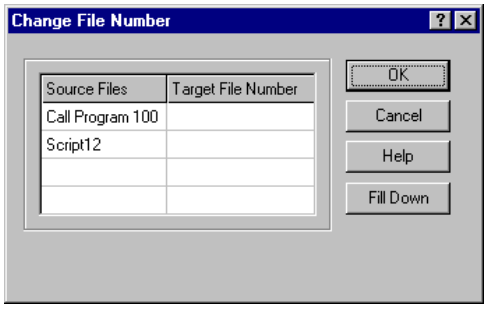


Cut Cut removes the selected call program from the call test set and places it on the clipboard.

Copy Copy copies the selected call program and places it onto the clipboard, without removing it from the call test set.

Paste Paste allows you to place a previously copied or cut call program into a different call test set.

Paste Special Paste Special allows you to change the file name and number of a copied file before pasting it into a new location.



Remove All Programs From Set Removes all call programs from the selected call test set.

Edit Select Edit to display the **Program Parameters Menu**. This menu allows you to change a call program's parameters. Double-clicking on the call program of interest also displays the Program Parameters Menu.

Enable Enable enables a highlighted call program in the displayed set.

Disable Disable disables a call program in the displayed set.

Run Run starts the selected call test set and displays the most recent system statistics accumulated in the connected unit. It operates in the same manner as the **Start** button on the **Tool Bar**. The **Status Bar** displays **RUNNING SET X**. This command is only valid when the status is **STOPPED** (no test running).

Finish Finish brings the testing of the set to an orderly conclusion. The **Status Bar** displays **FINISHED** after you click Finish.

Resume Resume continues running a **FINISHED** call program. New statistics are added to the old ones. The **Status Bar** displays **RUNNING SET X** when you click Resume.

Stop Stop stops running the call test set immediately. It also resets the report statistics. The **Status Bar** displays **STOPPED**. When you perform Stop prior to Finish, call programs may not report all events for calls in progress.

3. FILE MANAGEMENT

Call generator software is available on both a factory diskette supplied with the unit, and on an Internet Web Site. The software may be retrieved as described in ¶3.1.

The factory diskette contains Protocol **.stb** and **.hex** files, and Script **.src** and **.hex** files. The **.stb** and **.src** files are text files.

Host software in binary and hex formats as well as the latest Scripts and Protocols are available on the Internet.

The files that you download from Ameritec's web site (ameritec.com) are **self-extracting** compressed archives that contain the latest software, update instructions, and release notes for the update. Double clicking on the filename or executing it from the DOS prompt will expand this compressed file.

- The binary file (**.bin**) is required to download host software using the Ethernet port.
- The hex file (**.x**) is required to download host software using the RS-232 port.
- The hex files (**.hex**) are required to download Scripts and Protocols when you use FeatureCall or a Terminal program. Files beginning with **922xxxxx.hex** are Protocol files, while those beginning with **932xxxxx.hex** are Script files.

The host files stored on Ameritec's web site can only be used with Ameritec Call Generators that contain the high performance processors. To verify if you have the high performance processor, type **RM** at the unit prompt when connected via RS-232 or Ethernet, or check the host firmware revision from the front panel of an AM2 unit upon power up. The high performance processor will have host revision 4.0 or higher.

Many of the file management procedures in this document use Ameritec's Graphical User Interface (GUI) FeatureCall®. FeatureCall requires host software version 4.39 and above. SWARM™ Masters require host software version 4.43 and above. ScriptMate® generated scripts will only run on 4.50 host software and above. If you plan on using your Call Generators for any of these applications, you may need to upgrade your host software.

The following steps must be performed in order to obtain the information (host processor software, Scripts, Protocols, etc.) stored on the web site to use in upgrading your Ameritec Call Generator(s):

- Retrieving files from the web site
- Configuring the RS-232 and Ethernet ports
- Transferring the files to a call generator

3.1 Retrieving Files from the Ameritec.com Web Site

Host software in binary and hex formats as well as the latest Scripts and Protocols are available on the Internet from **ameritec.com**.

From the web site, select the title that you require:

AM2 and CRS Factory Disk Files
AM2 and CRS Host CPU Update
AM8e Factory Disk Files
Application Notes
BRI Master and Linecard Code Updates
FeatureCall Updates
Prep Script Compile Utility Program
Previous Revision Release Documents
Read Me First.pdf
Recommended Terminal Emulation Program
ScriptMate Updates

Download the required file(s) and transfer it to an appropriate directory on the PC.

3.2 Configuring the RS-232 and Ethernet Ports

To configure the Ethernet port, you must **first** configure the RS-232 port. For RS-232 operation, only configure the RS-232 port.

A terminal emulation program is required to load files to your unit. We strongly recommend the freeware program **TeraTerm** if you are not using Ameritec's GUI FeatureCall. **TeraTerm** has been identified to work for both serial and Telnet error-free transfers to the Ameritec AM2/CRS units. The **TeraTerm** program can be downloaded from Ameritec's web site. **TeraTerm** will run on MS-Windows 95/98, MS-Windows NT 3.51, and MS-Windows NT 4.0 Operating Systems. Download the self-extracting archive named TeraTerm.exe from the following location:

ameritec.com

Go to the directory called "**Recommended Terminal Emulation Program**".

CAUTION: When connecting to Ameritec AM2/CRS units via a serial port, HyperTerminal has typically been the most common terminal emulation program used to transfer files to and from the unit. When transferring files, Ameritec units require the use of **XON/XOFF** software flow control. We have found that the HyperTerminal program drops characters when used in this mode, which can cause code corruption requiring return of hardware to the factory for repair. Therefore, HyperTerminal **cannot** be used when transferring files to and from Ameritec units.

TeraTerm Installation Instructions

1. Once the file is located on your hard drive, extract the **TeraTerm** installation files by running the **TeraTerm.exe** program. When prompted for the folder to unzip to, select temporary directory (for example: **C:\TEMP**) or an empty floppy disk.
2. The **SETUP.EXE** installation program will run automatically.
3. When prompted, select a Destination Path for **TeraTerm** (for example: **C:\PROGRAM FILES\TTERMPRO**).

4. After the installation, the extracted installation files are no longer needed. You can delete them or keep them in the directory or floppy disk.
5. Run the **TeraTerm** program.
6. Select the [**Setup**] **Serial port...** dialog box and program the following settings:

Port:	**COM1, COM2, or other appropriate COM port**
Baud Rate:	**As selected by the unit (typically 19200)**
Data:	**8 bit**
Stop Bits:	**1**
Parity:	**None**
Flow Control:	**XON/XOFF**

7. Make sure you can communicate with the Ameritec AM2/CRS unit by pressing <**CR**>. The unit should respond with the unit prompt.
8. Once communicating, save these settings by selecting the [**Setup**] **Save setup...** dialog box. Overwrite the default **teraterm.ini** file by pressing the "**Save**" button. This will ensure that these settings will be the default every time **TeraTerm** is opened in the future.

3.2.1 Configuring the RS-232 Port

Configuring the RS-232 Port consists of:

- Connecting a PC to the Call Generator RS-232 Port.
- Setting up the Call Generator and PC serial communication parameters.

To configure the RS-232 Port, perform the following:

1. Obtain the necessary serial cable. Depending on the COM port on your PC, you many need a 25-25 pin or a 9-25 pin serial cable (see Tables 3-1 and 3-2).

Table 3-1. PC Cable [RS-232 Port to 9-pin Female Connector (48-0107)]

DB 25-Pin Female Connector		DB 9-Pin Female Connector
2	connected to	2
3	connected to	3
7 (ground)	connected to	5
5, 9, and 22 jumpered		4 and 6 jumpered
6 and 20 jumpered		7 and 8 jumpered
15 and 25 jumpered		

Table 3-2. PC Cable [RS-232 Port to 25-pin Male Connector (48-0084)]

DB 25-Pin Female Connector		DB 25-Pin Male Connector
2	connected to	3
3	connected to	2
7 (ground)	connected to	7
5, 9, and 22 jumpered		4 and 5 jumpered
6 and 20 jumpered		6 and 20 jumpered
15 and 25 jumpered		

2. Power up both the Call Generator and PC/Workstation.
3. Connect the Call Generator serial port to an available communications port on the PC/Workstation; usually COM1 or COM2.

> **Note**: If loading Hex files, use the RS-232 port. If loading binary files, use the Ethernet port.

Run **TeraTerm** and set the communications setup in **TeraTerm** to serial port with these parameters, **19200 baud**, **8 data bits**, **no parity**, **1 stop bit**, and **XON/OFF** software flow control. Be sure to select the correct COM Port. Select "**setup**", then save to keep your parameters. Save the file as **TeraTerm.ini**.

4. Enter **RM** to verify communication. **TeraTerm** displays the Call Generator status.
5. If you have privileged access, enter **ML <password>**. The default is **ML ameritec**. The monitor displays "Privileged Login".

> **Note**: If you need to change the password, use the **MP** command. If the password has been changed and you need to setup the Ethernet port, contact your system administrator.

6. Proceed to "**Configuring the Ethernet Port**" if using an Ethernet connection.

3.2.2 Configuring the Ethernet Port

To configure the Ethernet port you must have privileged access. In many locations Ethernet configuration is performed by the System Administrator.

A PC may be connected to the Call Generator via a LAN by connecting through a hub or directly via a crossover connection. Both connections use an 8-wire twisted pair cable with RJ-45 Telco jacks. The pinouts for the hub and crossover Ethernet connection are shown in Table 3-3.

Table 3-3. Ethernet RJ-45 Cable Connector Pinout

Hub Connection			Direct Connection (Crossover)		
RJ-45	Signal	RJ-45	RJ-45	Signal	RJ-45
1	Transmit +	1	1	Transmit +	3
2	Transmit -	2	2	Transmit -	6
3	Receive +	3	3	Receive +	1
6	Receive -	6	6	Receive -	2

3.2.2.1 Port Configuration - General

Configuring the Ethernet Port consists of using the RS-232 port to:

- Set the Internet Protocol (IP) address
- Optionally set the subnet mask
- Optionally set the Default Gateway
- Optionally set the Transmission Frame Type

3.2.2.2 Setting Up the Frame Type, IP Addresses, and Subnet Mask

Before you start, check with your system administrator to obtain the following addresses:

- Ethernet IP address
- Default Gateway IP address (optional)
- Ethernet Subnet mask (optional)

Note: The Call Generator accepts addressing and masking in a decimal format. If your administrator provides you with addresses in hexadecimal format, you must convert them to a decimal format.

To set up the IP addresses, frame type, and subnet mask, perform the following:

1. Enter one or more of the following commands and their respective parameters:

   a. **NI nnn.nnn.nnn.nnn** to set the IP address, where **nnn** is a number between 0 and 255. The default IP address is **192.0.0.2**. Make sure the Call Generator, PC/Workstation, and any other FeatureCall PC share the same address classification. The address ranges for each class are:

Class	IP Address Range		
A	0.0.0.0	to	127.255.255.255
B	128.0.0.0	to	191.255.255.255
C	192.0.0.0	to	233.255.255.255
D	234.0.0.0	to	239.255.255.255
E	240.0.0.0	to	247.255.255.255

   b. **NG nnn.nnn.nnn.nnn** to set the Default Gateway IP address, where **nnn** is a number between 0 and 255.

   c. **NF1** or **NF2** to set the Transmission Frame Type, where **NF1** is **Ethernet II** and **NF2** is **IEEE 802.3**. The default Transmission Frame Type is **Ethernet II**.

   d. **NM nnn.nnn.nnn.nnn** to set the Subnet Mask, where **nnn** is a number between 0 and 255.

> **Note:** The addresses are stored in Non-Volatile RAM and only need to be reentered for changes or after battery replacement.

2. Turn the Call Generator off and then back on to display the unit prompt.

> **Note:** For the **NI**, **NM**, and **NG** commands to take effect, turn the Call Generator off, then on.

3. Enter **ND**. The PC displays the Ethernet address, Transmit Frame Type, IP Address, Subnet Mask, and Default Gateway. The terminal displays a message similar to the following:

```
ameritec>ND
Ethernet addr   =  00:a0:4f:00:00:39
Tx Frame type   =  Ethernet II
IP addr         =  192.0.0.2
Subnet mask     =  255.255.255.0
Def Gateway     =  192.0.0.2
ameritec>
```

> **Note:** You can log these results to a file or print them for later reference.

4. Compare the displayed values to the values that you entered. Return to step 1 if any settings are incorrect.
5. If OK, enter **ML BYE** to log out of privileged access mode. This prevents unauthorized persons from entering privileged commands; otherwise, reenter the correct values.
6. Disconnect the PC from the Call Generator RS-232 Port.
7. Connect the Ethernet port to the Ethernet LAN. CRS units have an Ethernet port, while AM2 units require an adapter that connects to the RS-232 port.
8. Open a Telnet or *ftp* session and enter the Call Generator IP address. If everything is set properly the Telnet or *ftp* application will respond with a connection message.

Opening and Closing a Telnet Session

a. Open a Telnet session by selecting **Start**, **Programs**, **Accessories**, **Telnet**.

b. From the **Connect** pull down menu select **Remote System**. The Telnet window displays the Connect dialog box.

c. Enter the **<IP address>** of the unit, **telnet**, and **vt100** followed by selecting **Connect**. The Telnet window displays a series of messages followed by the unit id prompt of the unit. The unit is now in command line mode.

d. Enter **NX** to close the session. The Telnet window responds with the following message: **Connection to host lost**.

e. Select **OK**.

Opening and Closing a File Transfer Protocol (*ftp*) Session

a. Open an *ftp* session by selecting **Start**, **Programs**, **Command Prompt**. Windows NT displays the MSDOS Command Prompt window.

b. Enter **ftp <IP address>** at the MSDOS prompt. If successful, the window displays: **Connected to <IP address>**.

c. Press **Return** twice and enter **bye** at the **ftp>** prompt to close the *ftp* session.

3.3 Notes about Scripts and Protocols

Scripts

A Script in a movie or a play is a document that determines the order in which the scenes will take place, what will take place within the scenes, and who will say or do what. Similarly a Script is a text file with specialized syntax that forms the template for a Call Program to follow when it originates or terminates a call.

Each call consists of an originate Call Program and a terminate Call Program. The Scripts used for the originate and terminate Call Programs are determined by the types of calls being made.

Protocol Files

A Protocol is a State Table that defines the rules of engagement between the call generator and the switch-under-test. Protocols are assigned on a channel-by-channel basis. Each of the major stages in a phone call, from initiation to termination, is represented in the call generator by a specific state. A single channel of the call generator can only be in one state at a time.

Each state contains a list of events that the call generator will respond to by performing a specific action. The action may cause the call generator to remain in the same state, move on to the next state, terminate a call, etc. The action performed by the call generator in a specific state depends on which one of the expected events it receives.

If the call generator receives an unexpected event, it generates a Protocol System Error Message #251 and continues to wait in the same state until it receives an event that it recognizes. The stages or states that a call goes through from setup through teardown varies, based on the dialing method used and the switch configuration.

Each Protocol is identified by a number and an acronym. Use the number to identify the **.stb** or **.hex** file on the factory diskette for viewing/editing (**.stb**) or when transferring the Protocol to the call generator (**.hex**). Use the acronym to identify a Protocol when assigning it to a specific call generator channel.

3.4 Transferring the Files to a Call Generator

You may download files to an Ameritec Call Generator using either the Ethernet or RS-232 port. The file transfer and management operations are listed below:

- Transferring Host "binary" Files using the Ethernet Port (**.bin** files)
- Transferring Host Hex Files using the RS-232 Port (**.x** files)
- Transferring Script Source Files to a Call Generator
- Transferring Protocol State Table (**.stb**) Files to a Call Generator
- Transferring Script and Protocol Hex Files to a Call Generator
- Transferring Script or Protocol Files from a Call Generator
- Archiving Call Generator Files
- Erasing Files

3.4.1 Transferring Host Files using the Ethernet Port (binary files)

Requirements: Ethernet Port, *ftp* and Telnet apps on Windows95/98 or NT 4.0.

Time Requirements: approximately five minutes.

Note: Using the Ethernet port to download Host files only takes about 5 minutes whereas the RS-232 download typically takes about 45 minutes.

CAUTION: Transferring a new Host software release to the Call Generator may erase any resident Scripts, Protocols, Call Programs, Call Test Sets, Reports, Schedules, etc. Perform a full backup using the **Backup Unit Files** function from the **File** pull-down menu before downloading new Host software.

FeatureCall full backup does not save Ethernet settings such as the IP address. If you are not sure of the settings, use the **ND** command from a Telnet or **TeraTerm** setting and then print the results. These settings need to be re-entered after replacing a battery or updating the Host Software.

The following procedure assumes that the Host Software **.bin** file to be downloaded is resident either on the same or an accessible networked computer. The procedure also assumes that the PC that you will be using to perform the download is operating on a *Windows NT* or *Windows 95/98* platform.

Transferring a Binary File to the Unit Using File Transfer Protocol (FTP)

1. Open up the **MSDOS** window.
2. At the DOS prompt, initiate a **File Transfer Protocol** (***ftp***) session by entering **ftp <IPaddress>**. The MSDOS window displays **Connected to <IPaddress>**.
3. Press **Return** twice. The MSDOS window displays **Guest login ok...**.
4. Enter "**binary**" (**Case Sensitive - Use Lower Case Letters**).

CAUTION: The default *ftp* file transfer mode is ASCII. If you transfer the .bin file in ASCII mode, the file will be corrupted when the **MF <filename>** command is executed. When the call generator is later rebooted, the call generator will lock up and must be returned to Ameritec to have the system reloaded.

5. Enter **put c:\path\filename** where path\filename is the path where the host software .bin file is located. The MS-DOS window displays:

   PORT command successful.
   150 Opening BINARY mode data connection for <filename>.
   226 Transfer Complete.
   xxxx bytes sent in xxxx seconds (xx Kbytes/sec)

6. Verify that the MSDOS window displays **Transfer Complete**. Resend any incomplete transfers.

   Note: Incomplete transfers may be due to lack of available memory. Delete call programs to create the necessary available memory.

7. Enter **bye** to exit the *ftp* session.
8. Type **Exit** to close the MSDOS window.

Using a Telnet Session to Perform FLASH Download

Note: For Windows 3.1, you need a 3rd party Telnet application. If you do not have a Telnet program, stop and refer to "Host Update via RS-232" instructions.

9. Open a Telnet session by clicking on **Start**, and dragging the cursor to **Run**, then type **Telnet**, and finally click on **OK**. Windows NT or 95/98 displays the Telnet window.
10. From the **Connect** menu, select **Remote System**. The Telnet window displays the Connect dialog box.
11. Enter the **<IP address>** of the Call Generator, **telnet**, and **vt100**, followed by selecting **Connect**. The Telnet window displays a series of messages followed by the unit id prompt of the Call Generator. The Call Generator is now in command line mode.

12. Enter **HD** and verify the binary file is present on the Call Generator.

> **Note:** If you sent the wrong file you can erase it using the **HE <filename>** command.

13. Enter **ML** (Privileged Login).

    Login > ameritec

14. Enter **MF <filename>** of the binary file to be transferred. Enter the filename exactly as it was displayed by the **HD** command.

> **Note:** The filename portion of this command is case sensitive.

    The Telnet window displays:

    Load FLASH Application Block? [y/n] :

15. Enter **y**. (**Caution: Do not press <enter> or <cr> after the y**. If you do, you will lose the Telnet connection and must restore it before continuing to the next step. This should take approximately three minutes)

    The Telnet window displays:

    FLASH Vpp ON
    Erasing FLASH ... done
    Loading FLASH ... /done
    Verifying FLASH ... /done
    Reset unit to run program in FLASH memory

16. Enter **CX** or recycle power to reset the Call Generator. Resetting the unit automatically terminates the Telnet connection.

17. Wait a couple of minutes for the Call Generator to initialize before reconnecting.

> **Note:** If unable to reconnect after the unit has completed initializing, connect serially and press the **ENTER** key. If a **pROBE** prompt appears, follow the **pROBE+ Correction Procedure**. If unable to reconnect performing the procedure, contact Ameritec Customer Support at 626-915-5441.

18. Enter **RM**. If the download was successful, the Telnet window will display the status followed by the unit ID prompt and host revision.

19. Enter **NX** to close the session. The Telnet window responds with the following message: **Connection to host lost**.
20. Select **OK**.

3.4.1.1 pROBE+ Correction Procedure

When updating Ameritec's AM2/CRS Call Generator host to version using a Telnet connection, the unit may sometimes return with a "**pROBE+>**" prompt, instead of the unit prompt after power cycling the unit.

If nothing appears on your screen, you can recover by using the following procedure to get out of the "**pROBE+**" mode by cleaning out the RAMDISK using the **pROBE** debug command. The unit will not go back to the normal unit prompt with the "**GS**" or "**GO**" commands, which have been used in the past.

1. Reconnect to the unit via the serial connection.
2. At the **pROBE+>** prompt, enter:
   pROBE+>fm 50000000..5017ffff 00 (**enter**)
3. Power cycle the unit.
4. As the unit powers up, you will get an error message, "**file system error – unable to mount the ramdisk 0x2007**". Ignore this message and wait until the unit comes back with the "**ameritec>**" prompt.
5. Enter the following at the prompt: **ml ameritec** (**enter**) followed by **MD** (**enter**).
6. Enter "**y**" to confirm formatting.
7. After formatting, the unit will come back with the unit prompt. Type in **HD** (**enter**). The following should appear:

   Ameritec>HD
   bitmap sys
   flist.sys
   fdata
   stad

8. The unit prompt will return.

Note: Please note that all battery backup information such as Ethernet parameters, date, time, etc., will be lost. The IP address has to be setup again before you can address the unit via Ethernet.

For an AM2 unit, if your screen shifts (misaligned text) you will need to power cycle the unit again to clear the misaligned text.

3.4.2 Transferring Host Files using the RS-232 Port (hex files)

Requirements: TeraTerm Terminal Emulator found on Ameritec's Web Site.

Time Requirements: approximately forty-five minutes.

CAUTION: Transferring a new Host software release to the Call Generator may erase any resident Scripts, Protocols, Call Programs, Call Test Sets, Reports, Schedules, etc. Using FeatureCall, perform a full backup using the **Backup Unit Files** function from the **File** pull-down menu before downloading new Host software.

Transferring a new software release (a.k.a."host" program) into the Call Generator requires that the unit be in the 'privileged mode' of operation (**Privileged Login** from **File** pulldown menu or **ML** command). The new software release will reside in the Flash EPROM.

In order to load the new software release, the old release must first be erased. A single command, **MF**, erases the old release and initiates the Flash EPROM to receive the new release.

Use the following procedure to download a new software release:

1. Connect the Call Generator serial port to an available communications port on the PC/Workstation; usually COM1 or COM2.

   Set the communications setup in **TeraTerm** to serial port with these parameters: **19,200 baud**, **8 data bits**, **no parity**, **1 stop bit**, and **XON/OFF** flow control. Be sure to select the correct COM Port. Select "**setup**", then save to keep your parameters. Save as **TeraTerm.ini**.

2. To verify that the PC/Workstation is communicating with the Call Generator, enter **RM**. **TeraTerm** should display the unit status following by the unit ID prompt:

   Unit id <Ameritec>, Model XX, Version X.XXx 01-Feb-97
   Status: STOPPED
   Ameritec>

3. Enter **ML <password>**. **TeraTerm** displays the message:

   Privileged Login
   Ameritec>

4. Enter **MF**. **TeraTerm** responds with the message:

   FLASH is OK, Overwrite ? [y/n] : y (**DO NOT** press **Enter**)

CAUTION: Entering **y** will erase the existing contents of Flash memory. Make sure the new software release files are accessible for download from your PC/Workstation. Immediately after erasing the Flash memory, you will be prompted to load the replacement file.

5. Enter **y**. The monitor responds with the following:

   Erasing FLASH...done
   Load Extended Hex File

Note: While you can load the hex files at this point, it is faster to now power cycle the unit and wait for the "**Load Extended Hex Files**" prompt before continuing.

6. From the **File** menu, select **Send File** to transfer the host file from the PC/Workstation to the Call Generator. In the dialog box, select the **path<filename.x>** for the "host" program, e.g., the Call Generator Software Release. Verify that the option **binary** is not checked.

   The monitor displays the following: **.....,** indicating a download is in progress. **TeraTerm** opens a window showing the bytes transferred.

Note: Depending on file length, a “host” program download will take approximately 45 minutes to complete.

When the download is complete, the monitor displays a message:

Reset unit to run program in FLASH memory

7. Enter **CX** to reboot the unit. The monitor responds with information similar to the following:

```
REBOOT!!!
boot $Revision: 1.6 $
not done
bsp $Revision: 1.32A $
file system passed
?<Ameritec>  0 --- 04:08:38am  10 Nov 00  Power Lost          0
?<Ameritec>  0 --- 04:08:42am  10 Nov 00  Power Restored      0
new device: 1
new device: 2
new device: 3
new device: 4
```

8. Restore the files that you previously backed up (if necessary).

3.4.3 Transferring Script Source Files to a Call Generator

Script source files such as those created by ScriptMate or a Text Editor must first be converted to hex files before they can be used by a Call Generator. If you are using FeatureCall, it will perform the conversion automatically when you download Scripts using the Scripts window from the **Call Setup Scripts** pulldown menu. If you are not using FeatureCall, you must first convert the source file to a hex file using **Prep.exe**. Both procedures follow.

3.4.3.1 Transferring Script Source Files to a Call Generator Using FeatureCall

1. Connect the Call Generator and select it using the **Open System** window.
2. Select **Scripts** from the **Call Setup** menu.
3. Select the file under **Workstation Scripts** and click on **Download**.
4. Enter the script name (e.g. **A->B std**) and script number.
5. Click on **OK**. The Script will load and appear under **Unit Scripts**.

3.4.3.2 Converting Script Source Files to a Script.hex file using prep.exe

Prep is incorporated into the FeatureCall GUI and is therefore not needed when using FeatureCall. If using FeatureCall, select Call Setup/Scripts to download the **.src** file to the unit. The **prep.exe** utility program is supplied on the factory diskette to allow users to compile their own script files into the **.hex** format, which is downloaded to the unit. To convert the files into the **.hex** format:

1. Copy the **prep.exe** file into the same directory as your script file. The script file must use the **.src** file extension.
2. Open a DOS window and use the **CD** command to change directories until you are in the directory where your script and **prep.exe** are located.
3. Type **prep "Unit Script Name" <filename> unit_location**.

   "**Unit Script Name**" is the script name you want to appear in your unit. This name cannot be longer than 12 characters and must be surrounded by quotes if spaces are included in the name.

   <filename> is the name of the script file without the **.src** file extension

   unit_location is an optional selection of where in the unit the script is to be loaded by default. This must be a value from 1-20.

   A **.hex** file will be created as **<filename>.hex**.

   Eg. **prep "A->B std" 9320001f 1** would use the file **9320001f.src** and convert it to **9320001f.hex**. The script would load by default into script location 1 and would appear with the name **A->B std**.
4. The **.hex** file will be created in the same directory as the **.src** file and can be downloaded to the unit by following the "**Downloading Script & Protocol .hex Files via the TeraTerm Terminal Emulator**" instructions.

3.4.4 Transferring Protocol State Table (.stb) Files to a Call Generator

Protocol State Table (**.stb**) files, created on a Text Editor, must first be converted to hex files before they can be used by a Call Generator.

3.4.4.1 Converting Protocol .stb Files to .hex Files

The factory diskette came with both a **.hex** and **.stb** version of the protocol file(s). If you just need to reload a standard factory protocol, you can transfer the existing **.hex** file to the Call Generator. If, however, you modified the state table (**.stb**) file, you must first convert it to a **.hex** file. To convert the **.stb** file to a **.hex** file, it must be assembled and linked.

The assembler and linker is available from Softools, Inc. Ameritec is licensed to sell both the Softtools Linker and Assembler. When ordering, specify the Protocol Development Kit (P/N 190002).

To convert an **.stb** file to a **.hex** file, perform the following at the MS-DOS prompt:

1. Verify that the **am2p.bat** file, include files, assembler files, linker files, and **.stb** file are loaded in an MSDOS directory.
2. At the MSDOS prompt for that directory, enter **am2p <protocolfilename> (do not include the .stb extension)**.

   The assembler creates an object file (**.obj**) and listing (**.lst**) for the protocol file. The linker then creates a hex (**.hex**) file. During the conversion, the batch file, assembler, and linker will echo the current status of the process.
3. Verify that no error or warning messages are displayed. If any occur, check the error messages in the documentation that came with the *Softools* software.
4. If no errors occur, you may transfer the **.hex** file to the Call Generator using the one of the procedures under **Transferring Script and Protocol Hex Files to a Call Generator**, which follows this procedure.
5. Once transferred, follow the procedures in the *Ameritec Call Generator Protocol Table Development Guide (18-0038)* for debugging a new or modified protocol.

3.4.5 Transferring Script and Protocol Hex Files to a Call Generator

3.4.5.1 Transferring .Hex Files to a Call Generator Using FeatureCall

To download .hex files to a Call Generator using FeatureCall, perform the following:

1. It is recommended that you login to privileged access when downloading factory scripts and protocols. This will allow access to the factory protected script locations in the unit. Login by selecting the **File** menu followed by **Privileged Login...**. Enter your password at the prompt and click **OK**. The default password is **ameritec**.
2. From **File** pulldown menu, select **Download Files to Unit**.
3. When the **File: Download Hex Files to Unit** window is displayed, select the file to download and click on **OK**. Only one file can be downloaded at a time. Repeat procedure for each Script/Protocol to download.

Note: Script and protocol files are both downloaded as **.hex** files. This may become confusing. Be sure to give each type of file a distinctive name so that it may be readily identified. Ameritec's convention refers to scripts as **932xxxx.hex** files and protocols as **922xxxx.hex** files.

3.4.5.2 Transferring .Hex Files to a Call Generator using the Command Line Interface

To download scripts or protocols from the PC/Workstation to a Call Generator using **TeraTerm** Terminal Emulator:

1. Start the **TeraTerm** Terminal Emulator program.
2. Set the **TeraTerm** Terminal Emulator found on the Ameritec web site to **19,200 baud**; **8 data bits**, **no parity**, **1 stop bit**, and **XON/XOFF** flow control. Be sure to connect the correct COM port. Select "**setup**", then save to keep your settings. Save as **TeraTerm.ini**.
3. To verify that the PC/Workstation is communicating with the Call Generator, enter **RM**. The monitor should display the unit status followed by the unit ID prompt.

> **Note:** If the monitor displays the unit status but not the unit ID prompt, enter **!a**. If it still doesn't appear, enter **M>1**. The monitor returns the unit ID prompt.

4. It is recommended that you login to privileged access when downloading factory scripts and protocols. This will allow access to the factory protected script locations in the unit. Login by typing: **ML <password>** where **<password>** is the password for your unit. The default password is **ameritec**.
5. To transfer a Script or Protocol file to the Call Generator, enter **HL**. The monitor displays the message: **<unit> serial download**.
6. Under the "**file**" dropdown menu, select "**send file**". A popup window to select the file to transfer will appear. Select the filename for the Script or Protocol hex file to download.

> **Note:** Script and protocol files are both downloaded as **.hex** files. This may become confusing. Be sure to give each type of file a distinctive name so that it may be readily identified. Ameritec's convention refers to scripts as **932xxxx.hex** files and protocols as **922xxxx.hex** files.

Possible Messages During Download

For Protocols:

Enter Protocol Number (1 to 8)

For Scripts in non-privileged mode (no password entered):

Enter Script Number (11 to 20)

Existing Script/Protocol message:

Script/Protocol Number # Exists; Overwrite? (y/n):

Answer **n** to Overwrite?

Enter Script Number (1 to 20) or **Enter Protocol Number (1 to 8)**

Successful Download OK:

Script Save Successful
Please wait for call programs to assemble or
Protocol Save Successful

You entered Ctrl-C (or selected Cancel) anytime during the download:

Serial Load Hex File: aborted by user

Complete the transfer by entering the correct responses.

3.4.6 Transferring Script or Protocol Files from a Call Generator

3.4.6.1 Transferring .Hex Files from a Call Generator using FeatureCall

To upload .hex files to a PC using FeatureCall, perform the following:

1. From **File** menu, select **Upload Files to Unit**.
2. Select **Script** or **Protocol** from the drop-down list and click on **OK** to upload the file(s) to the PC.

> **Note:** Other available choices for **Upload Files to Unit** are **Set**, **Call Program Parameters**, and **Assembled Call Programs**. **prog**, **val**, and **set** files interact with one another, and backing these files up using the **Upload Files to Unit** function is not recommended. Use the **Backup Unit Files** command instead. See *Archiving Call Generator Files*.

3.4.6.2 Transferring Script & Protocol Hex files to a PC

The **HU <filename>** command transfers .hex files from the call generator(s) to the PC.

1. At the PC: With the **TeraTerm** terminal emulation program set up to communicate with the Call Generator, press **Return** or **Enter**, and make sure that a prompt (e.g., "**Ameritec>**") is displayed.
2. Type **HU <filename>** (where **<filename>** is the Script or Protocol name from Table 3-4 that you wish to upload) but do **NOT** press **Return** or **Enter**.
3. Open File/Log to a Log file on the PC. Enter the path and name of the file. The filename should end with the extension **.hex**. Remove the check on append and binary.
4. Press **Return** or **Enter**. You should see the Script or Protocol file on the screen. A series of dots "**.....**" may precede the file.

5. Once transfer is complete, close the Log file on the PC. You may need to open the minimized screen.
6. Repeat steps 2-5 for each Script/Protocol hex file to be saved.

3.4.6.3 Transferring Script Source (.src) Files to a PC

Protocol Source (**.stb**) files cannot be recovered from the Call Generator. To upload **.src** files to a PC using FeatureCall:

1. From the **Report** menu, select **Capture**, **Script...**.
2. Enter the number of the Script you wish to load and click on **OK** to upload the file to the PC.

3.4.6.4 Transferring .src Files from a Call Generator using the Command Line Interface

The **RT ss** command transfers Script source **.src** files from the call generator(s) to the PC. Protocol source **.stb** files cannot be reconverted from the Call Generator.

1. At the PC: With the **TeraTerm** terminal emulation program set up to communicate with the Call Generator, press **Return** or **Enter**, and make sure that a prompt (e.g., "**Ameritec>**" is displayed.
2. Type **RT ss** (where **ss** is the Script Number that you wish to upload) but do **NOT** press **Return** or **Enter**.
3. Open a File/Log to a Log file on the PC. Enter the path and name of the file. The filename should end with the extension **.src**. Remove the check on append and binary.
4. Press **Return** or **Enter**. You should see the Script file on the screen. A series of dots "**.....**" may precede the Script file.
5. After the "**# END**" close the Log file on the PC. You may need to open the minimized screen.
6. Repeat steps 2-5 for each Script file to be saved.

3.4.7 Archiving Call Generator Files

3.4.7.1 Archiving Files using FeatureCall

FeatureCall allows you to archive all the files in the unit (Full Unit Backup), or to perform selective backups, such as backing up Call Test Sets, by selecting **Backup Unit Files** from the **File** pull-down menu. The Backup Unit Files window contains a **Backup Type** subwindow with six backup selections. FeatureCall displays the file types included in backup selection grouping in the **Files Included in Backup** subwindow.

Select **OK** to back up the archive file selections to the PC's disk. The system displays a Backup Unit Files screen to show you the backup progression.

Note: When a file is backed up to the PC's memory, it overwrites any files with the same name. If you are going to back up multiple Call Generators, use **File Manager** (Windows 3.1) or **My Computer** (Windows 95/98) to create Featcall subdirectories for each unit.

Backup files can be restored at any time using the File, Restore Unit Files pull down menu.

3.4.7.2 Archiving Call Generator Configuration using TeraTerm Terminal Emulator

Table 3-4 lists the individual file types that exist in a Call Generator. Backing up files other than Script or Protocol files using the Command Line Interface is not recommended. Many file types, such as *prog*, *val*, and *set* files, interact with one another. All the files, with the exception of the *scrpt* and *proto* files, are created on the Call Generator; some automatically and others in response to commands that you enter. The only safe way to archive files other than Protocols and Scripts is to use the **Backup Unit Files** and **Restore Unit Files** functions available through FeatureCall.

Table 3-4. Call Generator Internal Filenames

File Name	File Type
BITMAP.SYS	system file
Configur	initial configuration data
Cpstable	call program stats table
FLIST.SYS	system file
Passign	protocol assignments file
Prog001-prog640	call program files (one for each assigned call program)
Proto001-proto008	protocol files
Repohead	report headings assignment file
Repopars	report parameters
Rtdata	real-time data
Runsched	run schedule
Scrpt01-scrpt20	script files
Set1-set4	set content files
Spl00009	spooler file (cannot be uploaded or downloaded)
Stad	internal stats data (cannot be uploaded or downloaded)
Val001-val640	files containing the parameter values

3.4.8 Erasing Files

3.4.8.1 Erasing Files using FeatureCall

FeatureCall allows you to selectively erase Scripts, Call Test Sets, Protocols, and Call Programs from the Call Generator. You may want to erase one or more files after archiving or simply to get rid of unwanted files. To erase files from the Call Generator:

1. Login as a privileged user by selecting **Privileged Login** from the **File** menu and enter the password.

   Note: The default factory password is **ameritec**. If the password has been changed and you need to erase files, see your System Administrator.

2. In privileged mode, select **Erase Files in Unit** from the **File** menu. Highlight the files in the **Erase Files in Unit** drop-down list and select **OK**.

3.4.8.2 Erasing Files using the Command Line Interface

The **HE** command erases files within a directory, and must be used with caution.

- To erase a single file, enter **HE <filename>**. The Call Generator deletes the file.
- To erase all files of a type, enter **HE <alpha...>**, where **alpha** is the alphanumeric characters in a file type, and **...** is a wild card that erases all files of that type.

For example, if you want to erase all of the Call Program files, enter **HE prog...**. The Call Generator erases all the Call Program files. See Table 3-4 for the list of internal filenames.

4. MENU AND SCREEN - REFERENCE SECTION

This reference section contains a listing of each interactive AM2-D/De screen or menu and the accompanying description. With the exception of the Initialization screen and MAIN MENU, the menus or screens are presented in Function Key order, the order in which they are accessed from the Main Menu. For example, the first menu described is **F1**-CONFIGURATION; the second, **F1**+**F2**-CHANNEL PROTOCOL ASSIGNMENT; etc.

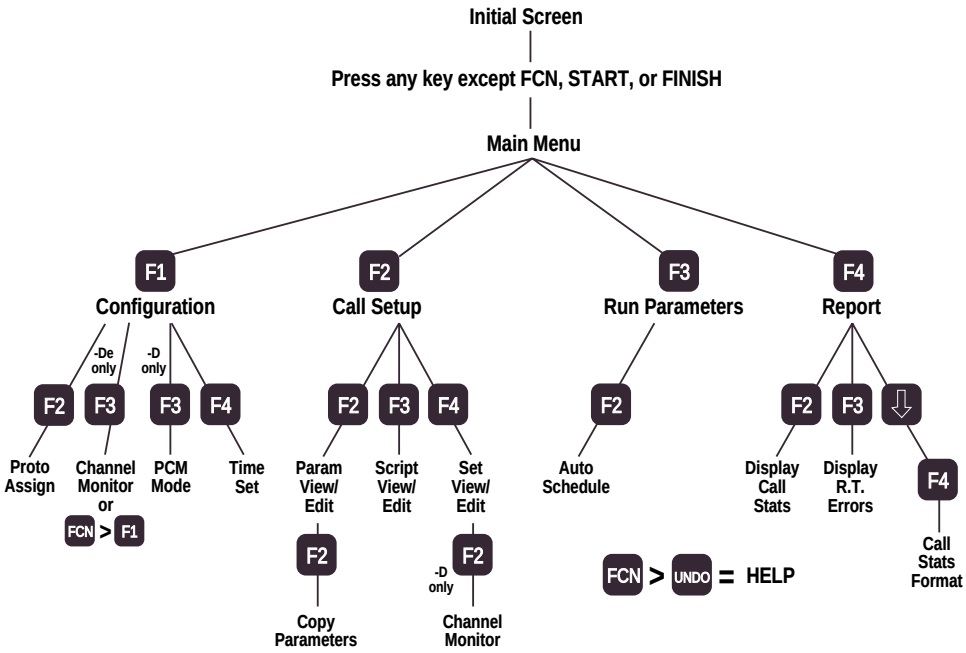


Figure 4-1. AM2-D/De Menu Tree by Function Key

Interactive and Message Only windows are presented within the context of the calling menus. Each listing description contains:

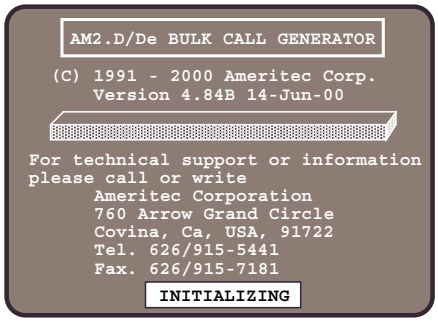
- a general and/or detailed functional description.
- a procedure for updating or using the screen.
- directions for accessing the menu/screen from the MAIN MENU.
- a list of the menus/screens that are accessible from that menu/screen.
- the related Control Command(s).

> **Note:** Material in this section repeats information presented elsewhere. This provides all required information on a specific topic without jumping around. Exceptions to this rule were kept to a minimum.

4.1 Initialization Screen

The AM2-D/De displays the initialization screen at power on or after the control command **CX**. The initialization screen displays the following:

- Model Number
- Current Status Caption
- Software Version
- Address and Telephone # for Technical Support



The current status caption displays four power-up messages in the following order: **INITIALIZING**, **TESTING DSP CARDS**, **SETTING UP TESTS**, and **Press a key to start**.

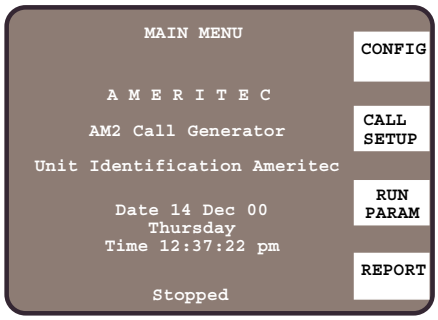
Press any key except **FCN**, **START**, or **FINISH**. The unit displays the MAIN MENU.

Related Control Command

RM Displays Unit ID, Model Number, Software Revision and Date, as well as the unit status.

4.2 Main Menu

The MAIN MENU is the starting point for accessing all other menus.



F1 Accesses CONFIGURATION MISC menu.

F2 Accesses CALL SETUP menu.

F3 Accesses RUN PARAMETERS menu.

F4 Accesses REPORT menu.

To access the MAIN MENU from the Initialization screen, press any key except **FCN**, **START**, or **FINISH**.

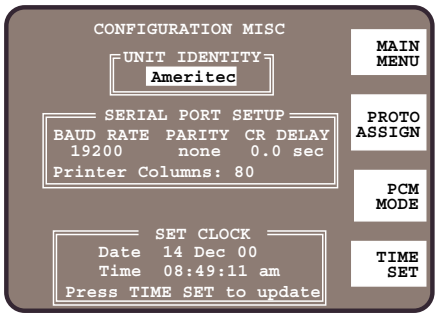
To access the MAIN MENU from any other menu/screen, press **F1** one or more times until AM2-D/De displays the MAIN MENU. The menu structure with the MAIN MENU at its root is shown in Figure 4-1.

Related Control Command	
MT	Displays Time and Date.

4.3 Configuration Misc Menu

The CONFIGURATION MISC menu allows you to set the unit identity, the serial port baud rate and parity, a carriage return delay for older printers, and the date and time. It also allows you to set the clock source and the framing (with or without CRC) for AM2-De units. You may change any of the parameters by using the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys.

Note: The only letters available from the front panel are A, B, C, D, E, w, p, f, and t. If you need to enter an ID that contains other letters, connect a PC-XT compatible keyboard to the **KEYBD** port or send the **MU <name>** control command from a PC/Workstation via Ethernet or RS-232.



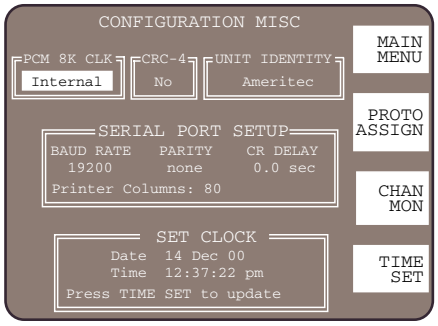
AM2-D SCREEN

F1 Press once to exit to MAIN MENU.

F2 Accesses PROTOCOL ASSIGNMENT menu.

F3 Accesses CHANNEL MONITOR screen.

F4 Updates clock to Time and Date entered in SET CLOCK window and displays clock symbol indicating new time/date setting has been entered.



AM2-De SCREEN

F1 Press once to exit to MAIN MENU.

F2 Accesses PROTOCOL ASSIGNMENT menu.

F3 Accesses CHANNEL MONITOR screen.

F4 Updates clock to Time and Date entered in SET CLOCK window and displays clock symbol indicating new time/date setting has been entered.

Note: Exit to the MAIN MENU to view the new time/date.

Related Control Commands

M1 Entering **M1** causes the monitor to display the new Unit ID followed by a ">" on the next command line prompt.

MU <name> Allows you to enter new Unit ID up to eight characters in length.

CC nnn where **nnn** is a column width between 40 and 132.

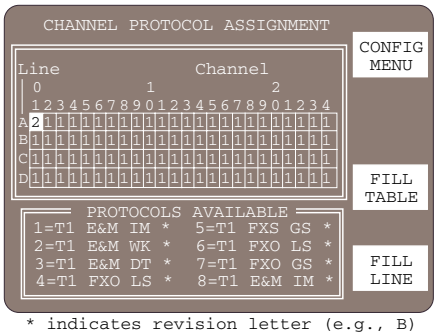
MT yyMMDDdhhmmssp See *Section 5 Command Reference* for details.

MT Displays time and date

4.4 Channel Protocol Assignment Menu

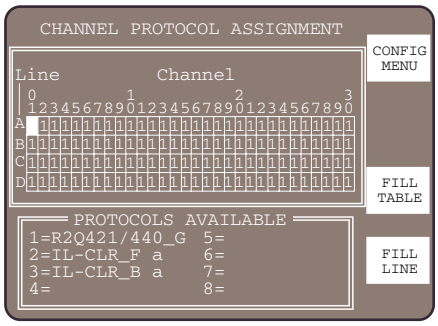
A protocol defines how an AM2-D/De channel responds to stimuli (Events). The CHANNEL PROTOCOL ASSIGNMENT menu allows you to assign protocols to individual AM2-D/De channels.

Up to four protocols may be loaded into the AM2-D, and up to eight protocols may be loaded into the AM2-De at any one time. These can be any combination of factory or user-written protocols.



* indicates revision letter (e.g., B)

AM2-D SCREEN



AM2-De SCREEN

F1 CONFIG MENU - Press once to access CONFIGURATION MISC menu, twice to access MAIN MENU.

F3 FILL TABLE - Press once to assign the highlighted protocol to the remainder of the channels in the table.

F4 FILL LINE - Press once to assign the highlighted protocol to the remainder of the channels in the line.

Note: The listed protocols are examples only and may not reflect the actual factory configuration.

Related Control Commands

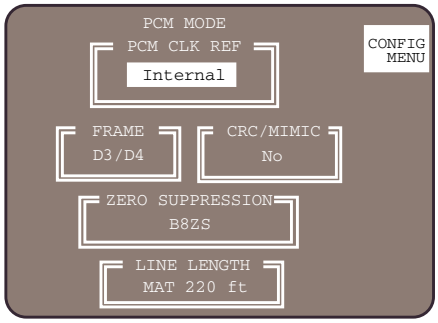
RA To view current protocol assignments.

PA ccc=n To assign a protocol to a single channel (**ccc**=channel #; **n**=protocol #).

PA ccc-ccc=n To assign a protocol to a range of channels.

4.5 PCM Mode (AM2-D Only)

The PCM Mode screen allows you to match the physical characteristics of the T1 lines with that of the switch under test. To select the PCM Mode menu, press **F3** (PCM MODE) on the CONFIGURATION MISC menu. After setting the parameters on this menu, press **F1** (CONFIG MENU) to return to the CONFIG MISC menu.



PCM CLK REF

This parameter sets the source of the PCM clocking.

Internal: The clocking signal originates within the AM2-D. The LINE TX connector becomes the source clock.

Line A, B, C, or D: Selects the respective Line receive port (RX) as an external source clock.

FRAME

This parameter selects the span framing type assignment for the tested circuit.

- D3/D4 selects superframe.
- ESF (Extended Super Frame) selects Extended Super Frame.

CRC/MIMIC

This parameter selects whether CRC/MIMIC checking is enabled (YES) or disabled (NO). The setting must match the CRC/MIMIC setting of the equipment under test. When set to YES:

- CRC checking is performed on PCM lines with ESF framing.
- MIMIC is performed on PCM lines with D3/D4 framing.

ZERO SUPPRESSION

This parameter determines the way that a PCM line handles a string of zeroes. Most T1 configurations use B8ZS.

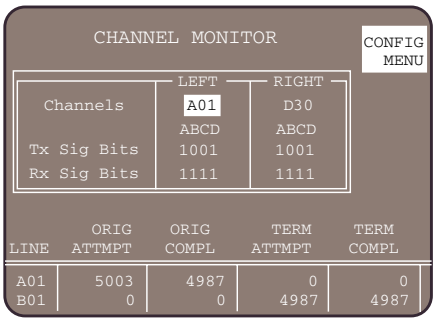
- B8ZS (BiPolar with Eight Zeros Substitution): Inserts two bipolar violations when eight consecutive "0's" are encountered. The receiving equipment recognizes the BPVs and correctly interprets the data.
- AMI (Alternate Mark Inversion): AMI does not inject Bi-Polar Violations and is subject to synchronization loss with a long string of zeroes. AMI is seldom used.

LINE LENGTH

This parameter selects the Cable Type and Line Length. Cable types are MAT and ABAM. Several Line lengths are provided for each cable type.

4.6 Channel Monitor Screen (AM2-De Only)

The CHANNEL MONITOR Screen is used to monitor the audio activity on the selected channels using the internal speaker or external headsets. The screen also allows you to view the statistics for any two channels. The displayed statistics contain the same cause codes as those presented in the CALL STATISTICS DISPLAY screen and be may be modified in the CALL STATISTICS FORMAT menu.



F1 - Press once to access CONFIGURATION MISC menu, twice to access MAIN MENU.

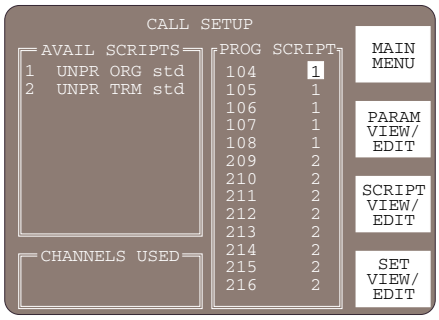
To select a different LEFT channel use the **FIELD CONTROL** keys to highlight the LEFT channel field and then use the **CHAR** keys, **DELETE** key, and numeric keys to change the channel selection. Repeat the same for the RIGHT channel selection.

Related Control Command

RS ccc|ccc-ccc|ALL lists call statistics for channels **ccc** where **ccc** is a channel number in the range of **A01-D30** and **ALL** is all 120 channels.

4.7 Call Setup Menu

The CALL SETUP Menu allows you to create Call Programs. Once you've created the Call Programs, you need to assign parameter values to the individual programs and then assign the programs to one of four sets. You can access these functions from the CALL SETUP menu using the **F2** and **F4** keys. You may also access the Script edit screen (**F3**), which allows you to copy and then modify existing scripts, using an XT-compatible keyboard. For information related to modifying scripts, see the *Ameritec Call Generator Script Writer's Guide*.



F1 Exits to MAIN MENU.

F2 Accesses PARAMETER VALUES menu.

F3 Accesses SCRIPT edit screen.

F4 Accesses PROGRAM SET menu.

Creating a Single Call Program

To create a single Call Program, perform the following:

1. Use the **FIELD CONTROL** keys to highlight an existing Call Program number in the PROG column or, if the set is empty, to highlight the empty space at the top of the PROG column.
1. Using the numeric keys, type in a new Call Program number.

> **Note:** Typing over an existing Call Program number does not delete or change the existing Call Program, it just adds a new Call Program number. If you accidentally enter an existing Call Program number, the AM2-D/De moves the cursor to that Call Program number.

1. Press ⇨ once to highlight the same row in the SCRIPT column.
1. Using the numeric keys, type in a Script number from the AVAIL SCRIPTS list.

> **Note:** If the AVAIL SCRIPTS window is full, you can highlight a SCRIPT number in the window by pressing ⇦ twice and then pressing ⇩ to scroll through the list.

Creating a Range of Call Programs

To create a Range of Call Programs, perform the following:

1. Use the **FIELD CONTROL** keys to highlight an existing Call Program number in the PROG column with the same script number as the program that you want to add, or, if the set is empty, follow the previous instructions for creating a single Call Program.
2. Press **FCN** then **VALUE** Δ. The AM2-D/De displays the Program Range window.
3. Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to enter a range of Call Programs, highlight ADD, and press **F1**. The AM2-D/De creates a range of Call Programs with the correct Script assignment.

> **Relax:** If you accidently enter a range of Call Programs that includes an existing Call Program, the AM2-D/De will not replace the existing Call Program. The original script and parameter assignments remain.

Changing Scripts in Existing Call Programs

To add a different script to an existing Call Program, perform the following:

1. Using the **FIELD CONTROL** keys, highlight the existing program's Script assignment.
2. Press the **DELETE** key once for Scripts 1-9 or twice for Scripts 10-20.
3. Use the numeric keys to enter a new script number.

Adding a Different Script to a Range of Call Programs

To add a different script to a range of Call Programs, you must first delete the existing Call Programs in that range. To delete the programs in that range, perform the following:

1. Using the **FIELD CONTROL** keys, highlight the lowest numbered Call Program in the range.
2. Press **FCN** then **DELETE**. The AM2-D/De displays the Program Range delete window.

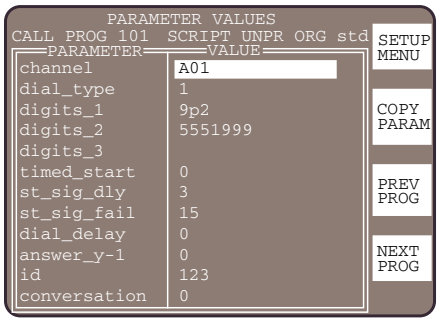
3. Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to enter a range of Call Programs, highlight DELETE, and press **F1**. The AM2-D/De deletes the range of Call Programs with the old Script assignment.
4. Follow the steps in *Creating a Range of Call Programs*.

Related Control Commands

RT 0 Lists available scripts.
HD prog Lists assigned Call Programs.
TK ppp/ppp-ppp Delete one Call Program or a range of Call Program(s).
PL ppp/ppp-ppp ss Assigns script **ss** to Call Program(s) **ppp**.

4.8 Parameter Values Menu

Parameter values are the items that make one Call Program different from another Call Program that uses the same Script. Parameters are script variables that allow you to assign channels and telephone numbers, establish delays, set the number of rings, etc. Some parameters have factory defaults assigned while others, such as line/channel assignments, must be entered for the Call Program to operate. The PARAMETER VALUES menu allows you to assign parameter values for the Call Program number in the upper left-hand corner of the menu. Once you've assigned individual parameters, you can press **F2** to mark those values for copying and/or copying with incrementation to other Call Programs that use the same script.



F1 Press once to exit to CALL SETUP menu, and twice to exit to the MAIN MENU.

F2 Accesses COPY PARAMETERS menu.

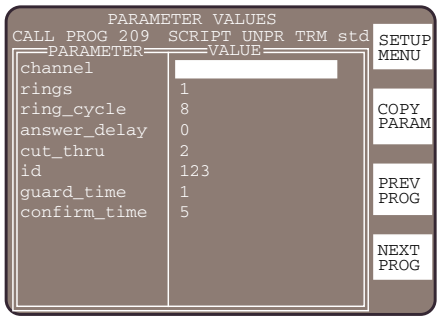
F3 Allows you to view parameters in adjacent lower-numbered Call Program number.

F4 Allows you to view parameters in the next higher-numbered Call Program number.

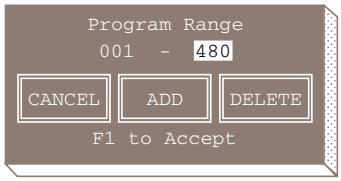
Note: You may also view the parameters in any existing Call Program number by highlighting the CALL PROG number in the upper left-hand corner of the screen, then entering a new number.

Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to highlight a specific parameter and then to enter a new value for that parameter.

The AM2-D includes a unique feature. Each open originate channel has a terminate channel to which it can be addressed to call. When you assign a Call Program to terminate, the parameter value screen will look a little different than an originate screen. It is important to note that the information on the screen to the right is for a terminate program only.

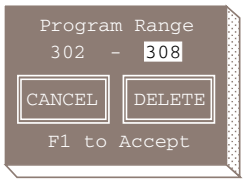


4.8.1 Add or Delete Program Range Window



F1 Press to accept highlighted function, i.e. CANCEL, ADD, or DELETE.

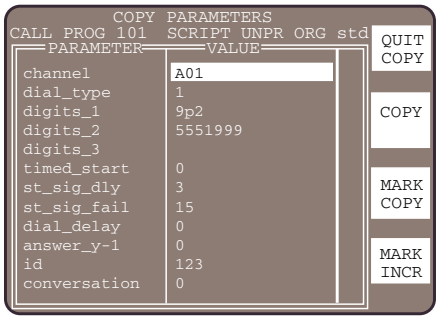
4.8.2 Delete Program Range Window



F1 Press to accept highlighted function, i.e. CANCEL, or DELETE.

4.9 Copy Parameters Menu

The COPY PARAMETERS menu allows you to highlight a parameter for copying or incrementing to a range of call programs.



F1 Press once to access PARAMETER VALUES menu and three times to access MAIN MENU.

F2 Accesses Copy to Programs window.

F3 Marks highlighted parameter for copying with an asterisk.

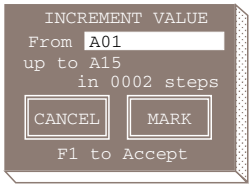
F4 Marks highlighted parameter for incrementing with a plus sign and displays INCREMENT VALUE window.

4.9.1 Marking a Value for Copying

To mark a parameter value for copying, highlight that value and press **F3**. The AM2-D/De places an asterisk to the right of the parameter.

4.9.2 Marking a Value for Incrementing

To mark a parameter value for incrementing, highlight that value and press **F4**. The AM2-D/De displays the INCREMENT VALUE window.

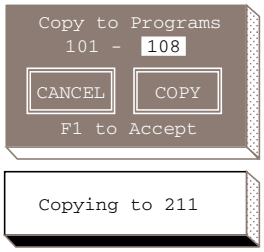


Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to enter a parameter value range that will be incremented in a range of programs that you enter in the Copy to Programs windows. When you press **F1** to accept the increment value, the AM2-D/De redisplays the COPY PARAMETERS menu and displays a plus sign in the narrow column to the right of the highlighted parameter, indicating that it has been marked for incrementing.

Note: Reference ¶2.10.3.1.1 for specific details related to Incrementing a value.

4.9.3 Copying Marked Values

To copy marked programs, press **F2**. The AM2-D/De displays the Copy to Programs window. Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to enter program range that marked parameters will be copied (*****) to or incremented (**+**) from. Highlight COPY and press **F1**. The AM2-D/De displays the Copying to ### window until it completes the copying process. When completed, the AM2-D/De displays the COPY PARAMETERS menu with all plus signs and asterisks cleared. You may continue to mark values for copying or incrementing to different Call Programs. When all copying is complete, press **F1** to return to the COPY PARAMETERS menu.



Related Control Commands

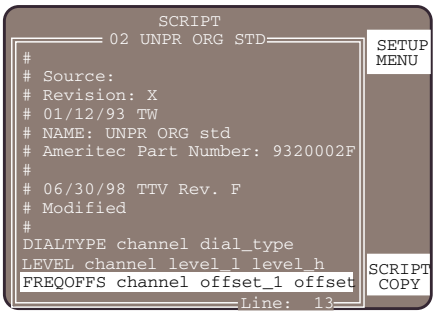
RV # Displays the parameters for the designated Call Program #.

PC ppp/ppp-ppp <name>=<value> Assigns a value to a parameter for a single Call Program or range of Call Programs.

PV ss Allows you to mark a parameter from a script **ss** for copying or incrementing. Entering **PV** opens up an interactive dialog, which allows you to continue until all parameters for copy or incrementing are added.

4.10 Script View/Edit Screen

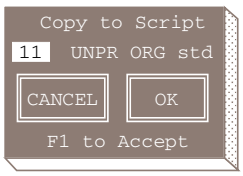
Factory scripts in the range of 1-10 cannot be edited on the AM2-D/De. The Script Screen, however, allows you to copy a script to a user script number in the range of 11 to 20, so that you can edit it without affecting the original script. The on-line AM2-De text editor works as a line editor, that is, when editing, you replace a complete line of text, rather than modify individual characters within an existing line. If you have major modifications in mind, you will probably find it more efficient to transfer the copied file to a text editor via the RS-232 port. Modifying scripts is beyond the scope of this manual. Refer to the *Ameritec Call Generator Script Writer's Guide*, P/N 18-0134 for script related information.



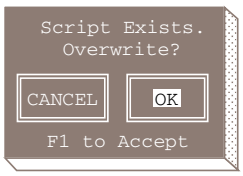
F1 Press once to exit to CALL SETUP menu and twice to exit to MAIN MENU.

F4 Press to copy script to a number in the range of 11 to 20 so it can be modified.

4.10.1 Copying a Script



Press **F4** (Script Copy) The AM2-D/De displays the window on the left. Enter a script number in the range of 11-20, highlight OK, and press **F1**. The AM2-D/De redisplays the Call Setup menu. If, however, the script already exists, the AM2-D/De displays the interactive message window on the right. If you select OK, followed by **F1**, the AM2-D/De overwrites the existing script and redisplays the Call Setup menu.



Select CANCEL, followed by **F1**, to repeat the copying sequence with a different script number.

4.10.2 Deleting a Script

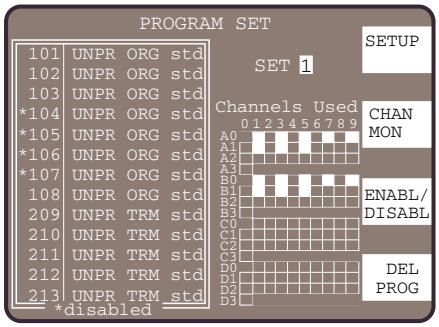
If you want to delete a script in the range of 11-20, press **F1** to return to the CALL SETUP menu. Use the **FIELD CONTROL** keys to highlight the script for deletion and press the **FCN** and **DELETE** keys. The AM2-D/De displays the Delete this script? interactive message window. Highlight OK and press **F1**.

4.11 Program Set Menu

In order for a Call Program to run, you must assign it to a Program Set. The PROGRAM SET menu allows you to assign Call Programs to any of four sets.

Once a Call Program is assigned to a set you may:

- enable or disable the program.
- remove it from the set.
- return to the CALL SETUP menu and delete it entirely.

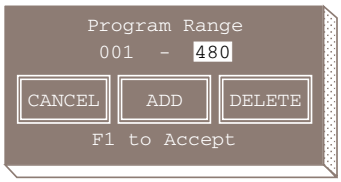


F1 Press once to access CONFIGURATION MISC menu, twice to access MAIN MENU.

F3 Press to enable a program with an asterisk or to disable a program without an asterisk.

F4 Press to remove a Call Program from a set. It isn't deleted and may be added later.

4.11.1 Add or Delete Program Range Window



F1 Press to accept highlighted function, i.e. CANCEL, ADD, or DELETE.

If the AM2-D/De cannot accept a Call Program assignment, it will issue one of the following error messages:

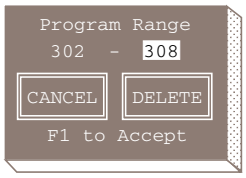
: If a set has a call program that contains the same channel numbers as a call program that you are adding, the AM2-D/De returns the error message Conflicting Channel. The AM2-D/De leaves the existing call program in the set and will not add the new one. This message will appear if the conflicting channel occurs within a single Call Program that you are adding or if the offending Call Program is within a Range of Call Programs that you are adding.

> **Note:** You can have multiple Call Programs with the same channel assignments, but no set may contain more than one Call Program with the same channel assignment.

: If your try to add a single call program without the proper parameter values or missing values or, if you try to add a call program number that doesn't exist, the AM2-D/De returns the error message No Such Program. This message will not appear if the offending Call Program(s) is within a range of Call Programs being added. The AM2-D/De simply will not add that program(s).

> **Note:** The AM2-D/De displays the Conflicting Channel or No Such Program error message until you press any key except **FCN**, **START**, or **FINISH**.

4.11.2 Delete Program Range Window



F1 Press to accept highlighted function, i.e. CANCEL, or DELETE.

Related Control Commands

RE s/0 Lists the Script and protocol channel assignments for each Call Program in Set **s** or, if you enter (**RE 0**), all sets.

TD s, ppp/ppp-ppp Disables Call Program(s) **ppp** in Set **s**.

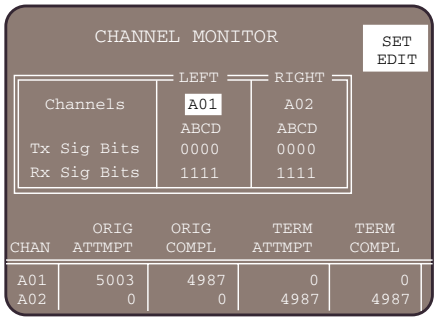
TE s, ppp/ppp-ppp Enables Call Program(s) **ppp** in Set **s**.

TL s, ppp/ppp-ppp Adds Call Program(s) **ppp** to Set **s**.

TU s, ppp/ppp-ppp Removes Call Program(s) **ppp** from Set **s**.

4.12 Channel Monitor Screen (AM2-D Only)

The AM2-D CHANNEL MONITOR screen is used to monitor the audio activity on the selected channels by means of the internal speaker or external headsets. The screen also allows you to view the statistics on any two channels. The displayed statistics contain the same cause codes as those presented in the CALL STATISTICS DISPLAY screen and be may be modified in the CALL STATISTICS FORMAT menu. This screen may also be access by pressing the **FCN** key and **F1**.



F1 Press once to access CONFIGURATION MISC menu, twice to access MAIN MENU.

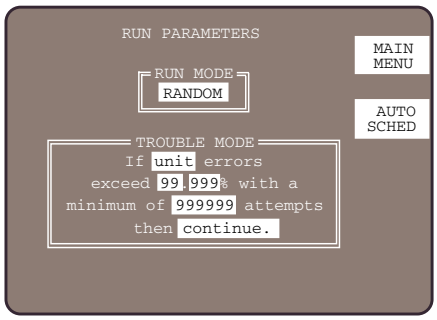
To select a different LEFT channel number use the **FIELD CONTROL** keys to highlight the LEFT channel number field and then use the **CHAR** keys, **DELETE** key, and numeric keys to change the channel number. Repeat the same for the RIGHT channel number.

Related Control Command

RS ccc|ccc-ccc|ALL lists call statistics for AM2-D channel **ccc** where **ccc** is a T1 channel number in the range of **A01** through **D24** and **ALL** is all 96 channels.

4.13 Run Parameters Menu

The RUN PARAMETERS menu allows you to select the RUN MODE and to set the TROUBLE mode.



F1 Press once to exit MAIN MENU.

F2 Press to access the AUTO SCHEDULING feature.

Run Mode

The AM2-D/De gives you a choice of two run modes, synchronous or random.

In **synchronous** mode, all originate channels go off-hook simultaneously and remain off-hook for the duration of the channel with the longest call sequence.

In **random** mode, after the initial start, each channel operates independently. Random mode generates the highest call generation rate.

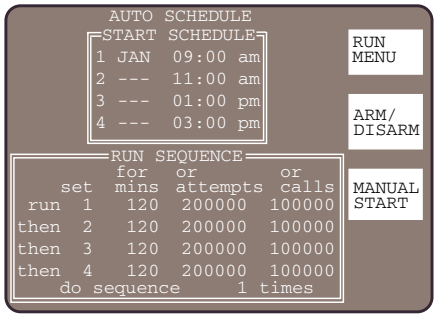
Trouble Mode

The Trouble Mode settings allow you to set the fault tolerance threshold of the AM2-D/De as well as the action that the AM2-D/De initiates once the threshold is exceeded. You may set the threshold for single call errors or for total call errors, but not both. Refer to paragraph *2.2.2 Setting the Trouble Mode* for details.

Related Control Commands	
RR	displays a listing of the current run and trouble mode settings.
TM m	where **m = 0** places the unit in random mode and **m = 1** places the unit in synchronous mode.
CT	sets trouble mode parameters. See *Section 5 Command Reference* for details.

4.14 Auto Schedule Menu

Auto scheduling allows you to program the test duration and the sequence in which call program sets will be tested. Before a program schedule and sequence can be run it must be armed.



F1 Press once to access RUN PARAMETERS menu, twice to access MAIN MENU.

F2 Arms or Disarms AUTO SCHEDULE.

F3 Starts run sequence immediately.

Start Schedule Setup

You may set up to four start times in the START SCHEDULE.

Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to setup the start schedule per the following:

start time sequence: 0 to 4; **hours**: 0 to 12; **minutes**: 00 to 59

Note: Entering 0 allows you to skip a start time.

Run Sequence Setup

The RUN SEQUENCE allows you to establish an order of testing. The setup allows you to run any combination of the four sets in any sequence.

Use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to enter the run sequence with the following ranges.

set: 0 to 4;

Note: Entering set 0 allows you to pause or skip a sequence depending on the **for mins** setting.

for mins: 0 to 9999 minutes.

or attempts: 000000 to 999999 attempts.

or calls: 000000 to 999999 calls.

do sequence: 0000 to 9999 times.

Note: Entering do sequence 0000 or 0001 has the same effect.

Arming/Disarming Schedule

The Auto Schedule must be armed in order to run.

To arm/disarm the schedule: In stop mode (**FINISH** LED solid red), press **F2**. The **START** LED blinks, indicating the schedule is armed. Press **F2** again to disarm the schedule. The **FINISH** LED returns to a solid red.

Manual Start

Press **F3** in stop mode to start the Run Sequence immediately.

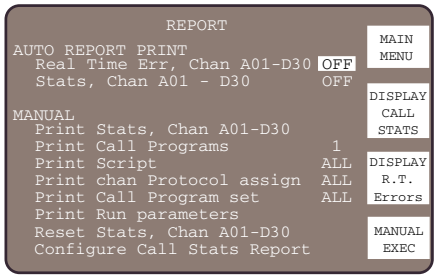
Related Control Commands	
RR	displays a listing of the current run and trouble mode settings.
TP n MM DD hh mm A/P	where **n** is the row number in the range of **1-4**, **MM** is the month in the range of **01-12**, **DD** is the day in the day in the range of **1-31**, **hh** is the hour in the range of **01-12**, **mm** is the minutes in the range of **00-59**, and **A/P** is either **A** for **AM** or **P** for **PM**.
TA1	arms start schedule.
TA2	disarms start schedule.

4.15 Report Menu

The REPORT menu allows you to:

- access the CALL STATISTICS DISPLAY screen.
- access the REAL TIME ERROR DISPLAY.
- access the CALL STATISTICS FORMAT setup menu.
- set automatic or on-demand printing for call statistics and real time errors for a selected range of channels on the RS-232 or Ethernet port.
- list the following reports for a selected range of channels on the RS-232 or Ethernet port:
    - call stats
    - call programs
    - protocol assignments
    - program set assignments
    - run parameters
- reset the call statistics register for a selected range of channels.

The REPORT menu also allows you to select specific intervals for updating registers.



F1 Press once to exit to the MAIN MENU.

F2 Press to view the Call Statistics.

F3 Press to view the Real Time Errors.

F4 Press to execute the highlighted MANUAL selection.

Note: The AM2-D provides 24 channels per line, while the AM2-De provides 30 channels per line. The following messages show data presented for an AM2-De.

Automatic Report Generation

```
Real Time Err, Chan A01-D30
```

Line/Channel Range: A01 to D30 (**CHAR**, **DELETE**, and numeric keys)

Auto Generation: OFF, ON (**VALUE** Δ or **VALUE** ∇ keys)

When set to ON, the AM2-D/De generates a report each time an error occurs.

Sample Listing:

```
000 ---  05:52:00pm   19 Nov 00  Power Lost                0
000 ---  04:52:29pm   23 Nov 00  Power Restored            0
  0 ---  09:41:31am   24 Nov 00  Start Set                 4
108 015  09:41:47am   24 Nov 00  005 No Start Signal      150
101 001  09:41:47am   24 Nov 00  005 No Start Signal      150
  0 ---  09:42:02am   24 Nov 00  Stopped Set               4
```

Related Control Commands

RL Lists Real Time Error Log.

RL 1|0 where **1** lists errors as they happen and **0** turns off automatic error listing.

`Stats, Chan A01-D30`

Line/Channel Range: A01 to D30 (**CHAR**, **DELETE**, and numeric keys)

Auto Generation: OFF, 1/4 hr, 1/2 hr, 1 hr (**VALUE** Δ or **VALUE** ∇ keys)

Sample Listing for Channels 01 to 03:

Ameritec

24 Nov 00 09:34:45am

CHAN	ORIG ATTMPT	ORIG COMPL	TERM ATTMPT	TERM COMPL	SLOW START	NO START	NO ALERT	NO CONFRM	AVG PD DELAY
001	10156	0	0	0	0	10156	0	0	0.0
002	0	0	0	0	0	0	0	0	0.0
003	10156	0	0	0	0	10156	0	0	0.0
TOTL	20312	0	0	0	0	20312	0	0	0.0

Related Control Command

RP m, ccc|ccc-ccc|ALL where **m** = a number in the range of **0** to **3** and **ccc** is a channel number between **A01** and **D30** and **ALL** equals all 120 channels.

- **m=0** the AM2-D/De scheduling is off.
- **m=1** the AM2-D/De lists the call statistics every 15 minutes.
- **m=2** the AM2-D/De lists the call statistics every 30 minutes.
- **m=3** the AM2-D/De lists the call statistics every hour.

Manual Report Generation

To generate a listing manually, use the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to highlight and modify a manual entry, followed by pressing **F4** to send the listing to the RS-232/Ethernet port.

`Print Stats, Chan A01-D30` prints selected range when you press **F4**.

Line/Channel Range: A01 to D30 (**CHAR**, **DELETE**, and numeric keys)

Sample Listing for Channels A01 to A03:

STATISTICAL REPORT

Ameritec

24 Nov 00 09:34:45am

CHAN	ORIG ATTMPT	ORIG COMPL	TERM ATTMPT	TERM COMPL	SLOW START	NO START	NO ALERT	NO CONFRM	AVG PD DELAY
A01	10157	0	0	0	0	10157	0	0	0.0
A02	0	0	0	0	0	0	0	0	0.0
A03	10157	0	0	0	0	10157	0	0	0.0
TOTL	20314	0	0	0	0	20314	0	0	0.0

Related Control Command

RS ccc|ccc-ccc|ALL lists Call Statistics for **ccc** where **ccc** is a channel selection **A01**-**D30** and **ALL** equals all 120 channels.

Print Call Program ALL prints one or all Call Programs from 1-480 and includes:

Sample Listing for Call Program 101 from Tutorial:

```
PROGRAM #101
 Name: UNPR ORG std Uses script #3
Parameter: channel       = A01
Parameter: dial_type     = 1
Parameter: digits_1      = 9p2
Parameter: digits_2      = 5551999
Parameter: digits_3      =
Parameter: timed_start   = 0
Parameter: st_sig_dly    = 3
Parameter: st_sig_fail   = 15
Parameter: dial_delay    = 0
Parameter: answer_y-1    = 0
Parameter: id            = 123
Parameter: conversation  = 0
Parameter: intercall     = 3
Parameter: call_call<s>  = 0
Parameter: level_l       = -9
Parameter: level_h       = -9
Parameter: offset_l      = 0.0
Parameter: offset_h      = 0.0
Parameter: ontime        = 60
Parameter: offtime       = 60
Parameter: confirm_time  = 5
```

Related Control Command

RV ppp lists the parameters for a single Call Program where **ppp** is a single call program number from **1** to **480**.

Print Script ALL lists all lines of a selected script (1-20) or all lines for all loaded scripts by script number.

Sample Listing for selected lines from an Unpaired Originate script:

```
ONHOOK channel
 DELAY intercall
 REPEAT 0
  TIME #d
  SUBTRACT #d #c #d
  IF.GEQU #d (call_call<s> * 10)
   LEAVE 1
  END
  DELAY 0.1
 LOOP
LOOP
```

Related Control Command	
RT	Lists all lines of all Loaded Scripts. Lists "does not exist" for unassigned script numbers.
RT n	Lists all lines of script **n** where **n** is a script number from 1-20.

`Print chan Protocol assign` `ALL` prints protocol assignment for all channels.

Sample Listing:

```
PROTOCOLS AVAILABLE
1=E-LOOP START
2=GROUND START
3=
4=

PROTOCOL ASSIGNMENT

          0                   1                   2                   3
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0

=================================================================
CHAN A    1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
CHAN B    1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
```

The above listing shows that E-LOOP START is assigned to channels A01 through A30 and GROUND START is assigned to channels B01 through B30.

Related Control Commands	
RA	Lists channel protocol assignments.

`Print Call Program set` `ALL` allows you to list the contents of individual or all Call Program Programs and their related line assignments.

Sample Listing for Program Set 4 from Tutorial:

```
PROGRAM SET # 4
  Program # 101: UNPR ORG std
    Channels Used: A01,
  Program # 102: UNPR ORG std
    Channels Used: A03,
  Program # 103: UNPR ORG std
    Channels Used: A05,
* Program # 104: UNPR ORG std
    Channels Used: A07,
  Program # 105: UNPR ORG std
    Channels Used: A09,
```

```
* Program # 106: UNPR ORG std
    Channels Used: A11,
  Program # 107: UNPR ORG std
    Channels Used: A13,
  Program # 108: UNPR ORG std
    Channels Used: A15,
  Program # 209: UNPR TRM std
    Channels Used: B02,
  Program # 210: UNPR TRM std
    Channels Used: B04,
  Program # 211: UNPR TRM std
    Channels Used: B06,
  Program # 212: UNPR TRM std
    Channels Used: B08,
* Program # 213: UNPR TRM std
    Channels Used: B10,
  Program # 214: UNPR TRM std
    Channels Used: B12,
  Program # 215: UNPR TRM std
    Channels Used: B14,
  Program # 216: UNPR TRM std
    Channels Used: B16,
Channels Used in this set:
    A01,B02,A03,B04,A05,B06,A07,B08,A09,B10,A11,
    B12,A13,B14,A15,B16,
```

Related Control Commands

RE n where **n** is a number in the range of **0** to **4**. If **n** = **0** then the AM2-D/De lists the contents of all sets. If **n** = a number between **1** and **4**, the AM2-D/De lists only the contents of the specific set.

`Print Run parameters` allows you to list the current settings for:

- Run Mode
- Trouble Mode
- Auto Schedule
- Run Sequence

Sample Listing:

```
 RUN MODE: RANDOM
TROUBLE MODE:
  If unit errors exceed 99.999%
  with a minimum of 999999 attempts,
  then continue.
START SCHEDULE
 8 ---  12:00pm
 2 ---  11:00am
 1 ---  12:00am
 1 ---  12:00am
```

```
RUN SEQUENCE
 Run set 4 for    1 mins or 999999 attempts or 999999 calls
then set 0 for    1 mins or 999999 attempts or 999999 calls
then set 0 for    1 mins or 999999 attempts or 999999 calls
then set 0 for    1 mins or 999999 attempts or 999999 calls
Repeat sequence   0 times
```

`Reset Stats, Chan A01-D30` allows you reset the statistics registers for selected lines. Resetting stats also clears the Real Time errors buffer, regardless of the number of channel registers selected.

Related Control Command

RC ccc|ccc-ccc|ALL where **ccc** is a channel selection in the range of **A01-D30** and **ALL** is all 120 channels.

4.16 Statistics Display Screen

The AM2-D/De displays call statistics in a tabular format similar to a spreadsheet. The screen displays only four columns at a time. To view other columns, press either ⇦ or ⇨ to scroll left or right. The AM2-D/De displays the Call Statistics register either on demand or at the programmed intervals that you specify in the Stats, Chan line in the REPORT menu.

STATISTICS DISPLAY REPORT

CHAN	ORIG ATTMPT	ORIG COMPL	TERM ATTMPT	TERM COMPL
TTL	40024	39853	39976	39850
A01	5003	4987	0	0
A02	5003	5000	0	0
A03	5003	4995	0	0
A04	5003	5003	0	0
A05	5003	5001	0	0
A06	5003	5001	0	0
A07	5003	4996	0	0
A08	5003	4887	0	0
A09	0	0	4987	4987
A10	0	0	5000	4998
A11	0	0	4995	4995

F1 Press once to exit to REPORT menu and twice to exit to MAIN MENU.

Note: To modify an entry or sequence of entries from the REPORT menu, highlight Configure Call Stats Report and press **F4**.

To monitor a limited range of Call Programs on the RS-232/Ethernet port, change the range settings in the AUTO REPORT PRINT Stats, Line entry and/or the MANUAL Print Stats, Line entry.

Related Control Commands

RP m, ccc|ccc-ccc|ALL where **m** = a number in the range of **0** to **3** and **ccc** is a channel number between **A01** and **D24** (AM2-D) or **A01** and **D30** (AM2-De) and **ALL** equals all 96 (AM2-D) or 120 (AM2-De) lines. When:

m=0 the AM2-D/De scheduling is off.

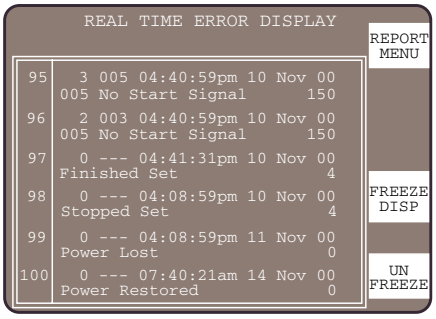
m=1 the AM2-D/De lists the call statistics every 15 minutes.

m=2 the AM2-D/De lists the call statistics every 30 minutes.

m=3 the AM2-D/De lists the call statistics every hour.

RS ccc|ccc-ccc|ALL lists Call Statistics for **ccc** where **ccc** is a channel number between **A01** and **D24** (AM2-D) or **A01** and **D30** (AM2-De) and **ALL** equals all 96 (AM2-D) or 120 (AM2-De) channels.

4.17 Real Time Error Display Screen



F1 Press once to exit to REPORT menu and twice to exit to MAIN MENU.

F3 Press when errors listed so rapidly you don't have time to read the results.

F4 Press when screen frozen. Unit resumes updating screen for each new error.

Related Control Commands

RL Lists Real Time Error Log.

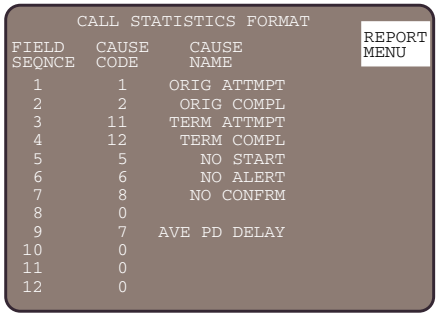
RL 1|0 where **1** lists errors as they happen and **0** turns off automatic error listing.

4.18 Call Statistics Format Menu

The AM2-D/De displays call statistics in a tabular format similar to a spreadsheet. The Call Statistics menu allows you to add, remove, and/or sequence the Cause Codes that will appear in the STATISTICS DISPLAY screen. Up to 32 cause code registers can be displayed simultaneously.

All additions, deletions, and resequences occur as a result of using the **FIELD CONTROL** keys, **CHAR** keys, **DELETE** key, and numeric keys to change numbers in any one of the 32 CAUSE CODE column entries.

Note: Entering a zero between existing rows that contain cause codes other than zero will generate a blank column on the STATISTICS DISPLAY screen/ report, e.g., if you only want to display six columns of data, enter zeros in columns 7 through 32.



F1 Press once to access RUN PARAMETERS menu, twice to access MAIN MENU.

Note: In the sample to the left, Cause Code 0 in sequence 8 creates a blank column in the STATISTICS display screen, CHANNEL MONITOR screen, and/or the RS-232/Ethernet port listing.

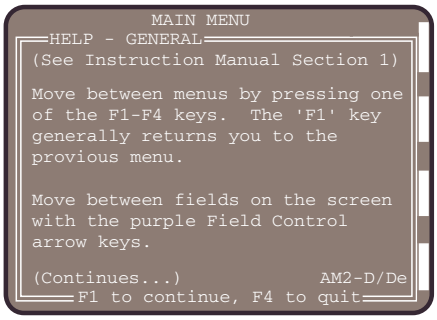
Paragraph 2.4.1 provides complete descriptions and procedures for formatting the Call Statistics display and/or report.

Related Control Command

RF <col #> <cause code> where **<col #>** is a column number in the range of **1-32** and **<cause code>** is the number of the cause code. Entering **0** instead of a cause code number removes the existing cause code and leaves a blank column if the zero is entered between existing columns.

4.19 Help Screens

Help screens are available from most screens/menus. To access help, press **FCN>UNDO**. The AM2-D/De displays the related help screen. If you press **FCN>UNDO** and nothing happens, there is no associated HELP screen.



F1 If (Continues...) is displayed on the bottom of the screen, press **F1** to access additional Help pages. Pressing **F1** returns you to the calling menu if there are no additional Help screens.

F4 Press to exit Help and return to the calling menu.

Related Control Commands	
?	Lists all commands with their related syntax.
α?	Lists only commands of the command type α,where α is the first letter of that command type, e.g. **m?** lists only the Miscellaneous Commands.
MH ?	Lists Index of AM2 Help Subjects.
MH <Topic>	Lists Help for selected topic.

5. COMMAND REFERENCE SECTION

This section lists commands alphabetically starting with special character commands such as **?** or **!**. Commands entered on Ethernet or RS-232 compatible workstations operating in an ASCII-character terminal mode can remotely control the AM2-D/De. The commands may be sent individually or may be embedded in a test language. The commands may be sent anytime the unit is not in Keystroke Mode (Section 6).

Typical ASCII generating devices, include but are not limited to:

- a VT-100 type terminal.
- an MS-DOS PC using a terminal emulation program.
- A Windows PC using the Windows 3.1 Terminal program and a COM port.
- or a Windows 95 or NT-based PC using HyperTerminal and a COM port.
- an Apple MacIntosh using a terminal emulator program and the serial port.

Note: As an alternative to sending commands individually or embedding them in a test language, you may control the unit using FeatureCall.

Help Commands

?	
List All Commands and Syntax	Returns a complete list of the remote commands. It displays the command, its syntax, and a brief description of the command.

∝**?** where ∝ is the first letter of a command type.		
List Commands and Syntax by Command Type	**Command Types:**	
	C = Configuration Commands	**N** = Ethernet Commands
	F= FeatureCall Commands	**P** = Program Operation Commands
	H = File Operation Commands	**R** = Report Commands
	M = Miscellaneous Commands	**T** = Test Control Commands

Chaining Commands

!A	
Address Unit A (also echo prompt)	Communicates with first unit in chain. When not chained, if AM2-De is not echoing an enabled prompt enter **!A**. The terminal displays the unit ID followed by the right carat (>).

! ∝ where ∝ is a letter in the range of **B** to **O**.	
Address Chain Units 2-15	**!** ∝ allows commands to individual chained units 2 through 15, excluding other units.

!Z	
Broadcast to All Units	**!Z** allows you to send commands to all chained units simultaneously.

Configuration Commands

CC nnn where **n** is a line width of from 40 characters wide to 132 characters wide. Default setting is 80 characters wide.	
Report Column Width	Allows you to adjust the width of your listing for a Call Statistics report.

CD	
Erases Current Configuration	**CD** is a privileged command that returns the unit to factory default settings. It destroys all user settings. After entering command, monitor prompts with following caution: **Current Configuration will be lost - Continue? [y/n]**

CF	
Configure Image Data Capturing Mode Images can only be retrieved using the MultiMedia Windows application.	**CF** allows the configuration of the Multimedia Image Data Capture mode selections. Entering the command without the parameters displays the current mode configuration. Each MMP line group has 4 image capture buffers. Any channel on the line group or span can be set to have images captured into any of the 4 image buffers. **Format 1 -** Request Image Data Capture Mode Selections **CF** **Format 2 -** Change Image Data Capture Mode Selection **CF s b cc pp m** where: s = Line Group Number/Span (1-4) b = Image Capture Buffer Number (1-8) cc = Channel Number on the Line Group/Span (1-32, 0 to unassigned buffer) pp = Image Page Number (1-200) m = Capture Mode (0 = No capture, 1 = Capture Always, 2 = Capture Once then stop capturing)

CI n where **n** is a number from 0 to 5	
Re-initializes Unit	**CI** re-initializes some, or all of the files and tables in a unit. **n = 0** Re-initialize all files **n = 1** Re-initialize set, protocol, and protocol assignment files **n = 2** Re-initialize set and call program files **n = 3** Re-initialize script dependent tables **n = 4** Re-initialize protocol and protocol dependent tables **n = 5** Re-initialize unit configuration files

CL C=a, F=a, L=an, R=a, Z=a	
Sets Up Unit Configuration.	**C** (CRC or MIMIC) =Y/N. The setting must match the unit being tested.
	F (Framing) =D/E - D for D3/D4 or E for ESF
	L (Line length & type) =M2 (MAT 220), M4 (MAT 440), M6 (MAT 655), A1 (ABAM 133), A2 (ABAM 266), A3 (ABAM 399), A5 (ABAM 533), A6 (ABAM 655)
	R (PCM Clock Ref) =I, A, B, C, D - Internal, Line A, Line B, Line C, Line D
	Z (Zero Suppression) =A, B, Z - AMI, B8ZS, ZCS
	C, F, L, R, Z - D models only (no Z with PRI ISDN) C, R - De models only

CM m ccc where **m** is the left **l** or right **r** audio monitor, and **ccc** is a channel in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De)	
Assign Audio Monitor Channels (Requires T1 Audio Monitor option)	Assigns 1 of 24 T1 slots to a AM2-D/De channel. The T1 slot number corresponds to the number entered as **mm**. The T1 slot carries a PCM translation of the audio for the assigned time-slot. You can monitor the time-slot by dialing a preassigned number in the switch. **Note:** To execute, the T1 Audio Monitor option must be installed

CS nnnnn where **nnnnn** is one of the following baud rates: **300**, **1200**, **2400**, **4800**, **9600**, or**19200**. No leading zeroes.	
Set Baud Rate	**CS** allows you to set the baud rate of the AM2-D/De remotely. The factory default baud rate is 19200. **Note:** When you change the unit baud rate, before attempting to communicate with the unit, you must also change the baud rate of the terminal.

CT - The Set Trouble Mode command allows you to set the fault tolerance threshold of the unit as well as the action the unit initiates once the threshold is exceeded.	
Set Trouble Mode	**Format 1 - CT** <**U/C**> **nn.n%** <**min attempts**> <**action**> where: **Format 2 - CT** <**U/C**> **nn.n%** <**min attempts**> <**unit action**> <**call action**>where: **U** errors are calculated on all the calls received by the unit **C** errors are calculated on the total errors by a single call program **nn.n** is a percentage between **00.0** and **99.9** of calls that failed The percentage of failed calls at run-time is calculated by: Current Error Percentage = Errored Calls/Call Attempts where: Call Attempts is total of CODE 1 and CODE 11 Reports (CODE 18 and CODE 20 (DXe Only) Errored Calls is total of every STOP executed by the Script <**minimum attempts**> minimum number of attempts allowed before the calculation is valid enough to take an action <**action**> is (Format 1 only) **O**, **U**, or **C** where: **O** Ignore all errors and continue test **U** Freeze unit when threshold conditions are reached, usually calculated on all calls. **C** Freeze call for which error threshold was reached. All other calls continue, usually used for errors calculated on single calls. <**unit action**> is (Format 2 only) **O**, **Z**, **F**, or **S** where: **O** Ignore all errors and continue test **Z** Freeze all call programs in unit when threshold conditions are reached. **F** Finish all call programs in unit when threshold conditions are reached. **S** Stop all call programs in unit when threshold conditions are reached. <**call action**> is (Format 2 only) **O**, **Z**, **F**, or **S** where: **O** Ignore all errors and continue test **D** Disable call program whose threshold conditions are reached. **Z** Freeze call program whose threshold conditions are reached. **F** Finish call program whose threshold conditions are reached. **S** Stop call program whose threshold conditions are reached.

CU	
Configure Trace Data Capturing Mode	**CU** allows the configuration of the MultiMedia Trace Data Capture mode selections. Entering the command without the parameters displays the current capture mode configuration. Each MMP line group has 8 trace capture buffers. Any channel on the line group or span can be set to trace into any of the 8 trace buffers. **Format 1 -** Request Trace Data Capture Mode Selections **CU** **Format 2 -** Change Trace Data Capture Mode Selection **CU s b cc m** where: s = Line Group Number/Span (1-4) b = Trace Capture Buffer Number (1-8) cc = Channel Number on the Line Group/Span (1-32, 0 to unassign buffer) m = Capture Mode (0 = No capture, 1 = Capture Always, 2 = Capture Once then stop capturing) After test run, trace data buffer can be retrieved via **TX**, **TT**, and **HU** remote commands.

CV	
Display/Add License Keys	**CV** adds a license key to an Ameritec Call Generator. Entering **CV** without parameters displays license key information already loaded in the unit. A list of licensed host types is displayed on Digital units, and a list of features and their supported channel limits on all models. **Format 1 -** Request Key List **CV** **Format 2 –** Add New Key **CV ABCD-1234-EFGH-5678** **CV ABCD1234EFGH5678** Contact Sales Support to obtain License Keys

CX	
Reboot and Initialize unit	**CX** is a privileged command. CX allows you to reboot and reinitialize the unit. It is equivalent to turning the power OFF and then ON. During initialization, the unit performs a self test.

FeatureCall Remote Commands

Note: These are remote commands used to support the functionality of FeatureCall, or to embed in third party test languages. These commands are not meant to be sent as individual commands.

FA	
	FA allows you to print assigned protocols.

FE	
	FE lists all Call Programs with their Script number, whether or not they are assigned to a Set. To determine which Call Programs are assigned to which Set, use **RE 0** command.

FF ss where **ss** is script/report page number (1-20)	
Retrieve Script Report Page Format	**FF ss** where **ss** is script/report page number (1-20) Ex. FF 2; FF 20

FG **FG ss** where **ss** is the script/report page number.	
Print Abbreviated Statistics Totals Report (**Standard Page Only**)	**Request Abbreviated Statistics** Ex. FG (Prints abbreviated statistics totals report for standard page) Ex. FG 0 (Prints abbreviated statistics totals report for standard page) Ex. FS 5 (Prints abbreviated statistics totals report for script page 5) Ex. FS 15 (Prints abbreviated statistics totals report for script page 15)

FH n1, n2, … n32 where **01-32** are statistical report codes for columns 1-32.	
Set Statistic Totals Report Column Assignment	**Set Standard Page Format** FH n1, n2, … n32 where nX is report code number (1-32) Ex. FH 1; FH 1,2,5; FH 1.3.11.32 **Set Page Format** FH #ss, n1, n2, … n32 where ss is script/report page number where ss is script/page number (0-20) where nX is report code number (1-65535), up to 32 codes Ex. FH #3, 1; FH #20, 1000, 23293, 50; FH #0, 1, 3, 11, 32 **Display Selected Codes** FH #ss where ss is script/page number (0-20) Ex. FH (display selected codes for standard page) Ex. FH #0 (display selected codes for standard page) Ex. FH #5 (display selected codes for script 5 page) Ex. FH #16 (display selected codes for script 16 page)

FL ccc [-ccc] where **ccc** is a line or channel or range of lines or channels.	
	FL defines the lines or channels to be included in the **FS** command output.

FM n1, n2, … n32 where **01-32** are statistical report codes for columns 1-32.	
Set Abbreviated Report Column Assignment	**Set Standard Page Format** FM n1, n2, … n32 where nX is report code number (1-32) Ex. FM 1; FM 1, 2, 5; FM 1, 3, 11, 32 **Set Page Format** FM #ss, n1, n2, … n32 where ss is script/report page number where ss is script/page number (0-20) where nX is report code number (1-65535), up to 32 codes Ex. FM #3, 1; FM #20, 1000, 23293, 50; FM #0, 1, 3, 11, 32 **Display Selected Codes** FM #ss where ss is script/page number (0-20) Ex. FM (display selected codes for standard page) Ex. FM #0 (display selected codes for standard page) Ex. FM #5 (display selected codes for script 5 page) Ex. FM #16 (display selected codes for script 16 page)

FP n where **n** is the set number in the range of **1** to **4**.	
	FP allows you to preload a set. This tells the units to load up the linecards with the Set to be run, but to not run it. **FP** synchronizes multiple-unit starts.

FS standard page only request **FS ss** where **ss** is script/report page number or "all" for all page codes selected.		
Print Abbreviated Statistics Report	**FS** **FS ss** Ex. FS Ex. FS 0 Ex. FS 5 Ex. FS 15 Ex. FS all	standard page only request where **ss** is script/report page number or "all" for all page codes selected. (Prints abbreviated report for standard page) (Prints abbreviated report for standard page) (Prints abbreviated report for script page 5) (Prints abbreviated report for script page 15) (Prints abbreviated report for codes selected on pages 0-20, starting with standard page codes up to page 20 codes)

FV ppp where **ppp** is the Call Program number.	
	FV allows you to output call program parameters.

File Operation Commands

HD <filename>|<filetype> where **filename** is the filename of a single file that you wish to delete and **filetype** is the letters in a filetype, e.g., to list all Call Programs loaded in the unit, enter **HD prog**.	
List Directory	Produce a directory listing of the files in a unit.

HE <filename>|<alpha...> where **filename** is the filename of a single file that you wish to delete, **alpha...** is the letters in a filetype, and the three period symbol (**...**) is a wildcard requesting that the unit delete all files of that type, e.g., to delete all the Call Program files, you would enter **HE prog...** .	
Erase File	**HE** is a privileged command.

HL readies the unit for loading of (.HEX) files in ASCII format. Transmission of the file must be initiated at a PC.	
Transfer File to AM2-D/De	**HL** is a privileged command for Script numbers 1 - 10. Only Call Program, Script and Protocol Table files can be transferred with the **HL** command. To transfer a Host program, refer to the **MF** command.

HU <filename>	
Transfer Hex File From AM2-D/De to PC/Workstation	Used to transfer Hex files from the unit to a PC/Workstation. Seldom used because transferred files are coded totally in hex. Files may or may not transfer back OK, because if one or more lines of hex were corrupted during the transfer, the corrupted code would be in hex and difficult to read/detect.

HW <filename> <text> <Ctrl Z>	
Write Text File to AM2-D/De	**HW** is a privileged command. Creates a text file. To enter a text file, type **HW** plus the filename, followed by a carriage return. Then enter the text, followed by Ctrl Z to terminate the file. A typical application is to download new help screens.

Filenames

File Name	File Type
BITMAP.SYS	system file
configur	initial configuration data
cpstable	call program stats table
FLIST.SYS	system file
passign	protocol assignments file
prog001-prog480	call program files (one for each assigned call program)
proto001-proto004	protocol files
repohead	report headings assignment file
repopars	report parameters
rtdata	real-time data
runsched	run schedule
set1-set4	set content files
spl00009	spooler file (cannot be uploaded or downloaded)
stad	internal stats data (cannot be uploaded or downloaded)
val001-val999	files containing the parameter values

Miscellaneous Commands

M> 0|1 where **0** = unit id prompt off and **1** = unit id prompt on	
Enable/Disable Unit ID Prompt	This command allows you to turn the unit id prompt on or off.

MC 0|1 where **0** = chain tag off and **1** = chain tag on	
Enable/Disable Chain Tagging	This command allows you to add a unit id to a command response. **!Z MC 1** for example, turns on tagging for all the units in a chain.

MD	
Reformat File System	**MD** is a privileged command. This will **DELETE ALL** unit files, disconnect any Telnet session, and restart the unit. A prompt ***Do you wish to do this? [y/n]*** is displayed.

ME c	
Set Esc key for remote key mode.	**ME** sets the character that is identified as the ESCAPE key in the remote keystroke sequences. The default key is ESC.

MF	
Force FLASH Transfer to AM2-D/De	**MF** is a privileged command. A new software release resides in the Flash EPROM. **MF** erases the old release and prepares the flash EPROM to accept the new release.

MH <?>	
Lists of Help Index Subjects	Lists the valid entry items for the **MH <subject>** command.

MH <subject> where **<subject>** is an item from the listing obtained by entering **MH?**.	
List Subject Description	

ML <password>	
Login to Privileged Mode	The **ML** command allows you access to privileged mode commands. On a new unit **ameritec** is the default password.

ML BYE	
Logout of Privileged Mode	**ML BYE** allows you to exit privileged mode. Logging out prevents unauthorized users from using commands that could adversely effect the performance of the unit.

MM	
Displays AM2 Main Menu	Displays the AM2 Main Menu on the AM2, not on the terminal from which you are sending the command.

MP <new password> where **<new password>** can be from 1 to 8 printable characters.	
Change Password	**MP** is a privileged mode command. **MP** allows you to change the password.

MR	
Enter Remote Keystroke Mode	Allows you to enter remote keystrokes from a PC-XT keyboard attached to the **KYBD** connector or from a keyboard that's part of an Ethernet workstation or PC connected via the RS-232 port. Refer to Section 6 for Remote Keystroke commands. **Note 1:** You cannot send control commands when the AM2 is in remote keystroke mode. Simultaneously press **ESC** and **Q** to exit remote keystroke mode. **Note 2:** Entering **MR**, places the AM2 in "AM2 Remote Keystroke Mode" and takes the AM2 out of "Command Entry Mode". **CAUTION:** Remote Keystroke Mode allows the terminal keyboard to simulate keys normally found on an AM2 front panel. In this mode, user feedback is limited. Since feedback is limited, you might accidently change an AM2 setting without knowing it. If you accidently enter **MR**, simultaneously press **Esc** and **Q** to return to "Command Entry Mode".

MS 1/0 where **1** enables the screen and **0** disables the screen.	
Enables/disables AM2 screen display.	This command allows you to disable the AM2 display. Disabling the display speeds up processing when you are sending control commands. **MS 1** reenables the AM2 display. When you enter **MS 0**, the AM2 displays '**Screen is DISABLED**'.

MT	
Display Time and Date	Displays time and date in the form of **yyMMDDdhhmmssp** where **yy** = year (**00-99**), **MM**= the month (**01-12**), **DD** = the day (**01-31**), **d** = the day of the week (**0** = Saturday), **hh** = the hour (**01-12**), **mm** = minutes (**00-59**), **ss** = seconds (**00-59**), and **p** = am/pm (am= **0**, pm = **1**).

MT yyMMDDdhhmmssp where **yy** = year (**00-99**), **MM** = the month (**01-12**), **DD** = the day (**01-31**), **d** = the day of the week (enter **0**), **hh** = the hour (**01-12**), **mm** = minutes (**00-59**), **ss** = seconds (**00-59**), and **p** = am/pm (am = **0**, pm = **1**).	
Set Time and Date	**Note:** In this format, the days of the week start with Saturday as **0**, Sunday as **1**, Monday as **2**, etc. If you enter a number from **1** through **6**, the AM2-De will hard code the day of the week. If you enter **0**, the AM2 will adjust the day of the week to match the entered calendar date.

MU <Unit ID> where the **Unit ID** is an alpha-numeric sequence up to eight characters long.	
Set Unit Identification	**MU** allows you to set the unit ID. The unit ID appears on call statistics reports, error listings, and the screen prompt. **Hint:** If you are chaining units, you may want to have part of the ID coincide with the ! (bang) command address, e.g., if you have an AM2-D in position f and an AM2-De in position g, you may want to set the unit IDs as **f-AM2-D** and **g-AM2-De** , respectively. In this way the prompt will tell you the model type at each **!** address.

MV m where **m** = **1** for the long format and **m** = **0** is the short format.	
Set Error Message Format	**MV** selects between a terse (single number) and a verbose (descriptive text) command error identification. The verbose message is the default.

Ethernet Commands

ND	
Display Ethernet Address Information	**ND** is a privileged mode command. **ND** displays the Ethernet address, Transmit Frame Type, IP Address, Subnet Mask, and Default Gateway.

NF where **NF1** = Ethernet II and **NF2** = IEEE 802.3	
Set Transmission Frame Type	**NF** is a privileged mode command. **NF** allows you to set the Ethernet Transmission Frame Type. The default Frame Type is Ethernet II.

NG nnn.nnn.nnn.nnn where **nnn** = a number between **0** and **255**.	
Set Gateway IP Address	**NG** is a privileged mode command. **NG** allows you to set the Ethernet Gateway IP Address. The Default Gateway IP Address is **192.0.0.1**

NI nnn.nnn.nnn.nnn where **nnn** = a number between **0** and **255**.	
Set IP Address	**NI** is a privileged mode command. **NI** allows you to set the Ethernet IP Address. The default IP address is 192.0.0.2.

NK n where **n** = a number between **0** and **538216** minutes. **0** maintains the Telnet session even if no commands are received for an infinite length of time.	
Set Telnet Session Keep Alive Time	**NK** is a privileged mode command. **NK** allows you to set the amount of time that the AM2 will rest between receipt of commands before it queries whether the workstation that started the session is still online. If the workstation is still online, the Telnet session will continue. If the workstation is off line, the AM2 will disconnect the Telnet session. The AM2 is then free to receive commands from any workstation on the network.

NM nnn.nnn.nnn.nnn where **nnn** = a number between **0** and **255**.	
Set Subnet Mask Address	**NM** is a privileged mode command. **NM** allows you to set the Ethernet Submask. The default Subnet Mask address is 255.255.255.0.

NX	
Exit from Telnet Session	**NX** allows you to exit the Telnet Session.

Program Operation Commands

PA ccc|ccc-ccc=n where **ccc**=line number or time-slot number **A01-D24** (AM2-D) or **A01-D30** (AM2-De) and **n**= line type or protocol number (**1-4**).	
Assign Protocol to a Line or Range of Lines	**PA** assigns protocols to the channels in a unit, or assigns Voice/Data protocols to the Bearer Channels in the unit. To determine available protocols, enter the **RA** command.

PC ppp|ppp-ppp, <**name**>=<**value**> where **ppp** is a call program number in the range of **1-480**, **name** is the name of the parameter that you want to change, and **value** is the new value for the parameter.	
Assign Value to Parameter	Use **PC** to change the value of a single parameter in one or more call programs.

PL ppp|ppp-ppp, ss where **ppp** = a Call Program Number in the range (**1-480**) and **SS** = Script number (**1-20**).	
Assign Script to Call Program(s)	

PV ss (where ss is a script number 1 - 20)	
Open Copy Dialog for Entering Parameter Values	Entering PV causes AM2 to generate COPY>> prompt, initiating interactive session. At COPY>> prompt enter **M**, **I**, **C, X,** or **L** where: **M** <**name> <value**> where **M** is the command t mark a parameter; **name** is the name of the parameter that you are going to mark for an action; and **value** is the new value that you are going to assign the parameter. **I** <**name**> <**init_value**> <**min_value**> <**max_value**> <**step_value**> where: • **name** is the name of the parameter that you wish to change. • **init_value** is the value from which the AM2 starts its incrementing. • **min_value** is the smallest value that the AM2 will enter. The **min_value** immediately follows the **max_value**. The unit starts incrementing from the **min_value** until it reaches the **max_value** or runs out of call programs. • **max_value** is the highest value that stepping is allowed to reach before the AM2 changes the parameter to the **min_value**. • **step_value** is the incremental value that the AM2 adds to the next call program in line until the max-value is reached, at which time rollover to the **min_value** occurs and incrementing begins again. **C** **ppp-ppp** where **ppp** is a line number in the range of **1-480**. **X** to close the interactive session. **L** to list script parameters

Report Commands

RA	
List Protocol Line Assignments	Lists all PCM Protocols in the unit. It also shows default assignments and assignments generated by the **PA** command

RB ccc|ccc-ccc|ALL where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group. **RB ccc|ccc-ccc|ALL, ss** where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group. **ss** is the script/report page number.	
List stats totals for lines/channels	Standard report – RS ccc[-ccc] where ccc is channel number or "all" Ex. RS all; RS A01; RS B01-B30 Extended report – RS ccc[-ccc], ss where ccc is channel number or "all" where ss is script/report page number Ex. RS all, 5; RS A01, 15; RS B01-B30, 1; RS C01-C02, 0 (prints stats for standard non-script specific report page)

RC ccc|ccc-ccc|ALL where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group.	
Reset Call Statistics Register	RC ccc[-ccc] where ccc is channel number or "all" Ex. RC all; RC A01; RC B01-B30 **Note:** Resetting even a single Call Statistics Line Register resets the Real Time Error Messages Buffer. **Note:** Resetting Call Statistics for a channel clears both Standard and Extended pages.

RD	
Remote diagnostics dump	**RD** is a privileged mode command. **RD** lists the Host Error Register contents, memory utilized, active line groups, Ethernet information, and Network Debug Register contents.

RE n where **n** is a number in the range of **0** to **4**. If **n** = **0** then the AM2 lists the contents of all sets. If **n** = a number between **1** and **4** then the AM2 lists only the contents of the specific set.	
List Call Program Set Assignments	

RF <col #> <cause code> where **<col #>** is a column number in the range of **1-32** and **<cause code>** is the number of the cause code. Entering **0** deletes a cause code but leaves the column spacing in place.	
Set Call Statistics Report Format	**RF** sets up one column of the Statistical report each time it is used.

RG ccc|ccc-ccc|ALL where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group.	
Set Realtime Reporting Range	**RG** sets the range of channels required for realtime reporting information.

RH ss, rrrr[-rrrr][,rrrr][,rrrr-rrrr] (up to 32) where **ss** is script/report page # (0-20) and **rrrr** is report code (1-65535)	
Set Report Column Assignment/Display Selected Codes	**Set Report Column Assignment** RH ss, rrrr[-rrrr][,rrrr][,rrrr-rrrr] where ss is script/report page number (0-20) Up to 32 codes where rrrr is report code (1-65535) Ex. RH 0, 1, 2, 11, 12 (standard page, 4 columns w/Orig Attempts, Orig Completes, Term Attempts, Term Completes) Ex. RH 2, 1, 2, 501-504 (script 2 page, 6 columns w/Orig Attempts, Orig Completes, Code 501, Code 502, Code 503, Code 504) **Display Selected Codes** RH ss where ss is script/report page number Ex. RH (display selected codes for standard page) Ex. RH 0 (display selected codes for standard page) Ex. RH 5 (display selected codes for script 5 page) Ex. RH 16 (display selected codes for script 16 page)

RL	
List Real Time Error Log	**RL** prints a list of all error messages that have accumulated since the last reset of the Call Statistics.

RL 1|0 where **1** lists errors as they happen and **0** turns off automatic error listing.	
Set Real Time Error Printing	**RL 1** automatic printing ON **RL 0** automatic printing OFF

RM	
Display Unit Status	Status includes Unit ID, Model #, Software Release Version, Date, and Operating Status (e.g. Stopped, Running Set #, etc.)

RN	
Print Revision	Prints the hardware and software revisions of the unit.

RP m, ccc|ccc-ccc|ALL where **m**= a number in the range of **0** to **3** and **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group. When: **m=0**.....the unit scheduling off **m=1**.....the unit lists the call statistics every 15 minutes. **m=2**.....the unit lists the call statistics every 30 minutes. **m=3**.....the unit lists the call statistics every hour.	
Schedule Listing of Call Statistics	

RR	
List Run Mode, Trouble Mode, Start Schedule, & Run Sequence Settings	The **RR** command allows you to view the Run and Trouble Mode settings.

RS ccc|ccc-ccc|ALL where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group. **RS ccc|ccc-ccc|ALL, ss** where **ccc** is a channel number in the range of **A01-D24** (AM2-D) or **A01-D30** (AM2-De), and **ALL** is all channels in the group. **ss** is the script/report page number.	
List Call Statistics	Standard report – RS ccc[-ccc] where ccc is channel number or "all" Ex. RS all; RS A01; RS B01-B30 Extended report – RS ccc[-ccc], ss where ccc is channel number or "all" where ss is script/report page number Ex. RS all, 5; RS A01, 15; RS B01-B30, 1; RS C01-C02, 0 (prints stats for standard non-script specific report page)

RT 0	
List Loaded Scripts	**RT 0** prints a listing of Scripts in the unit, by number and name.

RT ss where **ss** is a script number in the range of 1-20.	
Display a Script Listing in ASCII Format	**RT ss** lists the Script instructions (including parameters and variables in a selected Script.

RV ppp where **ppp** is a single call program number from **1** to **480.**	
List Call Program Parameters/Values	**RV** lists the name and number of the Script used by the specified Call Program, along with its parameters and assigned values.

Test Control Commands

TA 1|2 where **1** arms the test schedule and **2** disarms the schedule.	
Arm/Disarm Test Schedule	To execute the start schedule, it must be armed. Once armed, the schedule will begin executing at the earliest future time listed in the schedule.

TC n s mmmm aaaaaa cccccc tttt where: **n** is the row/sequence number in the range of **1-4.** **s** is the set number in the range of **1-4** or enter **0** if you want the sequence to pause for a set period. **mmmm** is the number of minutes that you want the program to run in the range of **1-9999**. **aaaaaa** is the number of call attempts in the range of **1-999999**. **cccccc** is the number of completed calls that will be made in the range of **1-999999**. **tttt** is an optional entry in the range of **1-9999** that instructs the AM2-De to run the sequence **tttt** times. If you do not enter a number in this field, the program will run the sequence once before **moving to the next line number**.	
Set Run Sequence	**Note: TC** will not execute if there is an error in the parameters.

TD s, ppp-ppp where **s** is the set number in the range of **1-4** and **ppp** is the call program number in the range of **1-480**.	
Disable Call Program	**TD** disables any Call Programs in a Program Set. The disabled Call Program remains in the Set.

TE s, ppp-ppp where **s** is the set number in the range of **1-4** and **ppp** is the call program number in the range of **1-480**.	
Enable Call Program	**TE** enables Call Programs within a Set that have been disabled by the **TD** command.

TF	
Halt Test	Halts any tests in progress as soon as the individual line tests are completed. LEDs will continue to blink until line tests complete. May be restarted using the **TR** (Resume) command.

TG	
Start Run Sequence Manually	**TG** immediately starts a Run Sequence.

TK ppp|ppp-ppp (Delete a Range of Call Program Files) where **ppp** is a call program in the range of 1-480.	
Delete Call Programs	**CAUTION:** The **TK** command deletes the actual prog file from the AM2. If the Call Program is assigned to more than one set, it will be removed from those sets. If you only want to remove a Call Program from a single set, use the **TU** command or disable the Call Program using the **TD** command.

TL s, ppp|ppp-ppp where **s** is a set number (**1**-**4**) and **ppp-ppp** are Call Program numbers in the range of **1**-**480**.	
Add Call Programs to Set	

TM m where **m = 0** places the unit in random mode and **m = 1** places the unit in synchronous mode.	
Set Run Mode	

TP n MM DD hh mm A/P where **n** is the row number in the range of **1-4**, **MM** is the month in the range of **01-12**, **DD** is the day in the range of **1-31**, **hh** is the hour in the range of **01-12**, **mm** is the minutes in the range of **00-59**, and **A/P** is either **A** for **AM** or **P** for **PM**.	
Schedule Tests	

TQ	
Stop Test Immediately	Stops all line activity. LEDs stop blinking on receipt of command.

TR	
Resume a Halted Test	

TS s where **s** is the set number in the range of **1-4**.	
Start Testing	

TT	
Retrieve Trace Buffer Data	**TT** transfers the contents of an MMP Trace Capture Buffer into a temporary file called "trace000". Once the data is in the file, its contents can be displayed and captured on a workstation using the **HU**, file upload, command. The file is displayed in HEX format. The files can then be viewed using the Ameritec TraceViewer program (P/N 942270102A). This application is an open source and can be requested through Ameritec Sales Support. Note that the Trace Buffer Retrieval process can also be easily handled by the MultiMedia Windows Application. Any buffer that has data can be retrieved using the **TT** remote command. Note that all trace buffers are cleared whenever a test set is started.

TU s, ppp|ppp-ppp where **s** is a set in the range of **1-4** and **ppp** is a call program in the range of **1-480**.	
Remove Call Program(s) from Set	**TU** removes the Call Program from the set. It does not delete the actual program (**prog**) file. To delete a Call Program use the **TK** command.

TV	
Display Call Program running state	**TV** displays the Call Program's running status. R = Running F = Finished D = Disabled S = Stopped

TX	
Trace Buffer Status List	**TX** displays a list of the status of the trace buffers on all line groups. Each line group is listed, followed by a list of the trace buffer numbers that currently have captured data in them. If a buffer is empty, it is not listed. Any buffer that has data can be retrieved using the **TT** remote command. Note that all trace buffers are cleared whenever a test set is started.

TY	
Print Test Run Time	**TY** prints the elapsed running time of the current set. If a set isn't running, the duration of the last test set run is displayed. Test duration is displayed as HH:MM:SS where HH is hours, MM is minutes, and SS is seconds. Ex: "Test's time is 0:23:02" or "Test's time is 324:23:02".

6. FRONT PANEL KEYBOARD EQUIVALENTS

Every key on an AM2-D/De front panel can be simulated from either:

- a PC-XT Keyboard connected to the unit's **KEYBD** connector.
- an Ethernet Workstation or PC using a Terminal Emulator after the remote keystroke command (**MR**) has been entered.

A PC Workstation in Keystroke mode or XT-Keyboard can be used for operations such as entering the Unit Identity or modifying scripts on the unit without transferring them to a text editor.

Table 6-1 consists of three separate groupings: Front Panel Keys, PC-XT Keyboard equivalent keys, and PC/Workstation equivalent keys. With the exception of Table entries followed by Note 1, keyboard entries are case sensitive.

Table 6-1. Front Panel Keyboard Equivalents

Front Panel Key(s)	PC-XT Key-stroke	PC/Workstation		
		Keystroke or Keystroke Sequence	On Screen Response	Note
F1	F1	<ESCAPE> 1	{F1}	
F2	F2	<ESCAPE> 2	{F2}	
F3	F3	<ESCAPE> 3	{F3}	
F4	F4	<ESCAPE> 4	{F4}	
CHAR ⇦	[	<ESCAPE> [	[	
CHAR⇨	]	<ESCAPE>]	]	
FIELD⇦	←	<ESCAPE> L	{LEFT}	1
FCN then FIELD ⇦	Home	Home key	{HOME}	2
FIELD ⇨	→	<ESCAPE> R	{RIGHT}	1
FCN then FIELD ⇨	End	End key	{END}	2
FIELD ⇧	↑	<ESCAPE> U	{UP}	1
FCN then FIELD ⇧	Page Up	Page Up key	{PGUP}	2
FIELD ⇩	↓	<ESCAPE> D	{DOWN}	1
FCN then FIELD ⇩	Page Down	Page Down key	{PGDN}	2
DELETE	F6	<ESCAPE> X or Backspace Key	{DELETE} {BS}	1, 2
HELP/UNDO	F5	<ESCAPE> H	{UNDO}	

Front Panel Key(s)	PC-XT Key-stroke	PC/Workstation		
		Keystroke or Keystroke Sequence	On Screen Response	Note
FCN on toggle to off	n/a	<ESCAPE> N <ESCAPE> N	{FCN} {NON_FCN}	1, 3
FCN on	n/a	<ESCAPE> +	{FCN}	3
FCN off	n/a	<ESCAPE> –	{NON_FCN}	
VALUE Up ⇧	F8	<ESCAPE> W	{VALUE UP}	1
VALUE Down ⇩	F7	<ESCAPE> V	{VALUE DOWN}	1
START (RESUME)	F9	<ESCAPE> S	{START}	1
FINISH (STOP)	F10	<ESCAPE> F	{STOP}	1
Send <ESCAPE> character	n/a	<ESCAPE> <ESCAPE>	{1Bh}	6
A/1	1	1	1	4
B/2	2	2	2	4
C/3	3	3	3	4
D/4	4	4	4	4
E/5	5	5	5	4
WAIT/6	6	6	6	4
PAUSE/7	7	7	7	4
FLASH/8	8	8	8	4
TOGGLE/9	9	9	9	4
0	0	0	0	4
*/+ (toggle) + and -	+	– +	– +	4
#/•	•	•	•	4
FCN then A/1	A	A	A	4
FCN then B/2	B	B	B	4
FCN then C/3	C	C	C	4
FCN then D/4	D	D	D	4
FCN then E/5	E	E	E	4
FCN then WAIT/6	w	<ESCAPE> N 6 <ESCAPE> N or <ESCAPE> +6 <ESCAPE> -	w	4
FCN then PAUSE/7	p	<ESCAPE> N 7 <ESCAPE> N or <ESCAPE> + 7 <ESCAPE> -	p	4
FCN then FLASH/8	f	<ESCAPE> N 8 <ESCAPE> N or <ESCAPE> + 8 <ESCAPE> -	f	4

Front Panel Key(s)	PC-XT Key-stroke	PC/Workstation		
		Keystroke or Keystroke Sequence	On Screen Response	Note
FCN then TOGGLE/9	t	<ESCAPE> N 9 <ESCAPE> N or <ESCAPE> + 9 <ESCAPE> -	t	4
FCN then */+	*	*	*	4
FCN then #/•	#	#	#	4
(non-enterable)	Insert	<ESCAPE> I	{INSERT}	5
n/a	n/a	<ESCAPE> Q (Used to quit keystroke mode)	unit ID> default = Ameritec>	1

PC/Workstation Notes	
1.	Keys are not Case Sensitive; for example, "<ESCAPE> L" equates to "<ESCAPE> l".
2.	Use of remote cursor-positioning keys depends on terminal used.
3.	FCN remains active until disabled by <ESCAPE> N or <ESCAPE> –.
4.	Use Shift key as needed.
5.	When editing Scripts 11 - 20, typing Insert on XT keyboard or <Escape> I on a PC/Workstation inserts a blank line above the highlighted line.
6.	The ESC key is the default control key for sending the ASCII escape character (1Bh) on a PC/Workstation. You may reassign 1Bh to another key by entering the **ME c** command where **c** is any key that generates a single ASCII character. If you reassign the escape character it will revert to ESC when you recycle power on the AM2.

7. SPECIFICATIONS

7.1 Call Programs and Scripts

Call Test Sets

Up to four sets; resides in non-volatile memory

Call Programs

Up to 480; resides in non-volatile memory

Scripts

- Up to ten factory scripts; resides in non-volatile memory
- Room for up to ten user generated scripts

7.2 Reports and Listings

Manual Reports

On demand listings of Call Statistics by channel, range of channels, or all channels

Automatic Reports

- Lists Call Statistics at regular intervals: every 15 minutes, every 30 minutes, or hourly.
- Programmable Call Statistic Reports

Call Statistics Registers

Generates Call Statistics for each originate line including activity counters for the following:

- Calls Attempted
- Calls Completed
- Delayed Start Signal
- No Start Signal
- No Alert Signal
- No Voice Path
- Busy Signal Encountered
- No Answer Signal
- Ring Time Out
- Custom Code Report Count

The Call Statistics Registers can also average the times on the originate channels for the following:

- Dial Tone Delay
- Post Dial Delay

Generates Call Statistics for each terminate channel, including activity counters for the following:

- Calls Attempted
- Custom Code Report Count
- Calls Completed

Real-Time Error Reporting

- Listed as they occur
- Lists of to 150 most recent error reports on demand
- Listing reports the error type, channel(s) involved, and time of occurrence
- Error types reported:
  - Slow Start
  - No Start
  - No Alert Tone
  - Path Confirmation Failure
  - No Answer Signal
  - Ring Time-Outs
  - Busy
  - Custom Code Report Count

7.3 User Interface

- Front Panel via pushbuttons and Menu-Driven Display (add XT-compatible keyboard for full alpha-numeric entry)
- Command Driven via RS-232 or Ethernet
- Windows NT, Windows 3.1, and Windows 95 compatible, Optional GUI FeatureCall Interface.

7.3.1 Front Panel Controls and Indicators

Display

Flat panel high-resolution electroluminescent screen with bit-mapped graphics capability.

Character Resolution

8 x 16 pixels.

Screen Resolution

40 characters by 16 lines.

User Interface

Menu-driven with window overlays.

Status LEDs

Unit Status

Start and Finish LEDs.

FINISH LED solid red

Unit Stopped.

FINISH LED flashing

Unit Halted.

START and FINISH LED alternately flashing

Unit Stopped on Error.

Channel Status

96 LEDs, one LED per channel (AM2-D)

120 LEDs, one LED per channel (AM2-De)

Channel Status LED Colors:

Dark: Idle **Green:** Originate Line Off-Hook

Red: Line Error **Yellow:** Terminate Line Off-Hook

Pushbuttons

29 pushbuttons including: four soft function keys, field control and character position cursor keys, numeric entry keys, value entry keys, Help key, special function combination keys, selected alpha keys for entering parameter values, Start key, and Finish key.

External Keypad

PC/XT compatible port for entering full range of alpha-numeric characters for script editing and unit ID.

Audio Monitor

Volume controls for adjusting left and right volume of speaker or 600Ω stereo phone jack. Used in conjunction with Channel Monitor menu, which allows you to assign the left and right volume to specific channels.

7.3.2 Ethernet/RS-232 Ports

Ethernet

- DB-25 to RJ-45 10Base-T adapter (48-0192)
- Serial 1-to-2 extension cable to simultaneously connect the 10Base-T adapter and RS-232 ports (48-0189)
- 10Base-T Interface (10Mbps)
- IEEE 802.3 Compliance

RS-232

DB-25P, 25-pin male connector.

RS-232 Auxiliary Ports for Chaining

DB-9P, 9-pin female connector.

7.4 Test Interface

Test Ports

Eight bantam connectors wired per EIA/TIA standards (24 channel pairs each).

7.5 Physical Characteristics

Power: 90-264 VAC @ 47-65 Hertz and 300 watts.

Dimensions:

Width: 16.8 inches (43cm)
Height: 11 inches (29.5cm)
Depth: 7.2 inches (18.5cm)
Weight: 18 lbs (8.2kgms)

Environment

Operating Temperature: 0ºC to 40ºC
Humidity: 10% to 90% non-condensing

7.6 System

Capacity

- 96 channels (AM2-D)
- 120 channels (AM2-De)

Clock

INPUT: Capture range is ±30ppm. Signal frequency within this range is guaranteed to be captured.

OUTPUT: Frequency accuracy is ±100ppm. Output signal frequency is guaranteed to be within 100ppm.

Channel Types

- Channels compatible with NIS S106-1
- DTMF in-band Dialing

System Start Modes

- Manual
- Random
- Synchronous

Trouble Encounter Response

- Continue
- Stop on Error
- Stop on Programmed Error Thresholds

7.7 Tone Detectors

Call Progress Detectors

- One detector per line
- Detects dial tone, busy, reorder, ring supervision, and wink tones

Path Confirmation Receiver

One receiver per line

Frequency Range

10 to 2500 Hz

Accuracy

1%; ± 10 Hz

Sensitivity

0 to -24 dBm

Response Time

12.5 msec

DTMF Receiver

Decodes received DTMF digits

Response time

Under 40 msec

Dynamic Range

35 dB

7.8 Digit Generators For In-band Signaling

One digit generator per channel

Dialing Codes

MFR1, MFR2, DTMF

Default Level

-9 dBm

Default Frequencies

Nominal = 0.005%

Programmability

Each channel individually for Level and Frequency

Level

0 to -50 dBm in 1 dB steps for each frequency component

Frequency

Up to 12.5% above or below nominal in 0.1% steps for each frequency component.

7.9 Confirmation Tone Generators

Produces 64 selectable tones, including ten preprogrammed single tone signals, used to send the line ID from each side encoded as a three-tone sequence.

Encoding Scheme

0 .....1025 Hz	4 .....1525 Hz	7 .....1900 Hz
1 .....1150 Hz	5 .....1650 Hz	8 .....2025 Hz
2 .....1275 Hz	6 .....1775 Hz	9 .....2150 Hz
3 .....1400 Hz		

8. WARRANTY, CALIBRATION, AND SERVICE

8.1 Warranty

Ameritec Corporation warrants that its electronic instrument products are manufactured to the highest commercial standards and are free from any defects in material or workmanship. For a period of one (1) year from shipment, Ameritec will repair without charge to the original purchaser any unit, which upon inspection by Ameritec proves to be defective.

This warranty is the sole warranty offered by Ameritec and is in lieu of all other obligations or liabilities, including claims of consequential damage; however, an EXTENDED WARRANTY PLAN may be purchased. For information contact an Ameritec Sales Representative.

8.2 Service Policy

Ameritec products are designed with plug-in printed circuit boards and modular assemblies. Once a problem is localized, service is accomplished by PC board (or module) replacement.

8.3 Calibration Policy

All Ameritec products are manufactured to commercial standards and are calibrated with equipment traceable to NIST (National Institute of Standards and Technology). With the exception of component failures or abuse, Ameritec instruments are designed to maintain compliance with their published specifications throughout their service life.

While periodic calibration verification is normally not required, in critical applications it is recommended that verification be accomplished annually.

Calibration verification is most efficiently accomplished by return of the equipment to the Ameritec factory where specialized test equipment is used. Field calibration verification is not supported by Ameritec.

8.4 FeatureCall License & Warranty

Be advised: By opening the sealed FeatureCall software package(s) or by using the *Software*, you agree to be bound by the terms and conditions of the FeatureCall Agreement. If you do not agree to the terms of the FeatureCall Agreement, promptly return the complete product, with a copy of the purchase order, to AMERITEC, or its authorized dealer, for a full refund or for a credit against future purchases.

For further Warranty and Licensing information, please refer to the User's Manual accompanying your FeatureCall software.

8.5 Return of Unit

In the event of a malfunction call or write to the Ameritec factory and obtain a return authorization number. Return the unit to Ameritec freight prepaid with a note in-warranty repair) or a Purchase Order for the repair (out-of-warranty repair) listing the following information:

- Return authorization number from Ameritec.
- Return shipment address of purchaser.
- Name and telephone number of person at purchaser's location familiar with the problem.
- Brief description of problem (include any printouts that may have a bearing on the problem, if possible).
- Terms of payment for repair costs (out-of-warranty unit).

The unit will be repaired and returned freight-prepaid for units in warranty and freight-collect for units out-of-warranty. As stated above, a Purchase Order to cover the cost of repair must accompany any out-of-warranty return of the unit to Ameritec.

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9. GLOSSARY

ACRONYM	COMPLETE TERM or DEFINITION
AC	Alternating Current
ASCII	American Standard Character Set
ASK	Amplitude Shift Keying
CPE	Customer Premises Equipment
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
dB	decibels
dBdsx	3V Peak-to-Peak
dBm	decibels relative to 1 mw
dBrn	decibels of relative noise (0 dBrn = -90 dBm)
DC	Direct Current
DSP	Digital Signal Processor
DTMF	Dual Tone Multi-Frequency
E1	2048 Kbit telephone line containing thirty-two 64Kbit channels.
ERL.	Erlangs
FSK	Frequency Shift Keying
GUI	Graphical User Interface
Hz	Hertz (cycles per seconds)
IP	Internet Protocol
kB	kilobytes
Kbps	kilobits per second
Mbps	Megabits per second
MFR1	Multi-Frequency R1
NV-RAM	Non-Volatile Random Access Memory
P/N	Part Number
PBX	Private Branch Exchange
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
POTS	Plain Old Telephone Service
ppm	pulses per minute
PSM	Protocol State Machine
PST	Protocol State Table
PSTN	Public Switched Telephone Network
RAM	Random Access Memory
ROM	Read Only Memory

ACRONYM	COMPLETE TERM or DEFINITION
Rx	Receive/Receiver
Tx	Transmit
VAC	Volts Alternating Current
VDC	Volts Direct Current

A.1. APPENDIX A: Cause Codes

A.1.1 Real Time Error Message Codes

Table A-1 provides codes and message text for errors that occur as the unit is operating. Table A-2 provides the 'y' register code definitions for System Error messages. Table A-3 defines Call Statistic Data Register Codes.

An example of a Real Time Error Message with descriptions of each section is shown below. The underlines do not appear in the actual listing.

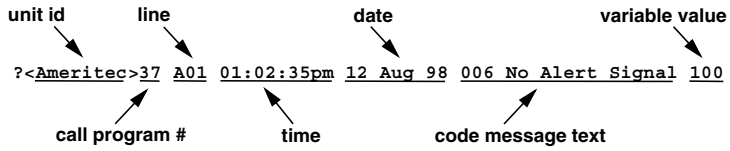

Table A-1. Real Time Error Report Messages

Report Name	Code	Message Text	Report
R_SLOWSTART	4	004 Slow Start Signal x	SLOW START
R_NOSTART	5	005 No Start Signal x	NO START
R_NOALERT	6	006 No Alert Signal x	NO ALERT
R_NOCONF	8	008 Confirming Failure x	NO CONFRM
R_BUSY	9	009 Called Subs Busy x	CALLED BUSY
—	10	010 No Answer Signal x	NO ANS SIGNAL
—	13	013 Ring Timeout x	RING TIMOUT
R_A1 • • • • R_A15	33 • • • 47	033 R2 A1 Received 0 047 R2 A15 Received 0	(first and last of series shown)
R_B1 • • • • R_B15	48 • • • 62	048 R2 B1 Received 0 062 R2 B15 Received 0	(first and last of series shown)
NOSZAK	63	063 No Seize Ack	Internal error
	239	File System Fault	
—	240	Power Lost 0	Internal error
—	241	Power Restored 0	Internal error
—	242	Start Sets s	Internal error. s=1-4
—	243	Finished Set s	Internal error. s=1-4
—	244	Stopped Set s	Internal error. s=1-4

Report Name	Code	Message Text	Report
—	245	Stopped on Trouble s	Internal error. s=1-4
—	246	Lost Real Time Reports r	Internal error. r = number lost
—	247	Code is unassigned	Internal error
—	248	Invalid Ch Assgn*	X = 1 - Call Program Assignment Err X = 2 - Audio Monitor Assignment Err
—	249	Code is unassigned	Internal error
R_GDSPERR	250	Global DSP error	
R_PSTERR	251	Protocol Error*	X = state number/unexpected event number.
R_INTRERR	252	Cause Code*	X = cause code.
R_RMError	253	Layer 1 ACT Error*	(BRI Only)
R_CPError	254	Call Prog Error	X = the offset into the Call Program where an error has occurred **or** -1 if out of memory on LGC when trying to download a new Call Program.
R_SYSERR	255	255 System Error y	See Table A-2 for y values

Any code over 32 automatically generates a Real Time Error message.

Any codes up to 32 may also be specified for Statistics Display/Statistical Report.

The register ("y") follows the message text for System Error. The meaning of these values are listed in Table A-2.

Names in Report column are default report-column headings for all units.

* Units with older versions of Host Software will have "Code is Unassigned" as the text.

A.1.2 Error Code 255 - System Error Message

The System Error message has the same format as any other Real Time error message; however, the register value represents conditions detected at the system level. Refer to Table A-2 for the recommended factory values.

Table A-2. System Error 255 'y' Value Messages

'y' Value	Definition
1	Dial timeout
2	Send ID timeout
3	Receive ID timeout
4	DSP acknowledge timeout
5	Request DSP timeout

'y' Value	Definition
6	Request global DSP slot timeout
7	DSP not available
8	Bad received message type
9	Call Program download buffer busy
10	State Table reject (running)
11	Reserved for future factory use
12	No response (DONE or FAIL response to GETDSP (internal)
13	Timeout waiting for MEASURE result
14	DSP manager was busy for STATE
15	DSP manager was busy for CP
16 - 31	Reserved for future factory use
32-255	User-defined

A typical example of a system error message follows:

?<Ameritec> 37 A01 04:25:35pm 12 Nov 00 255 System Error 1

This message indicates that while program 37 was testing simulated TE #1 on Channel A01, a Dial Timeout (register value = 1) was detected.

A.1.3 Call Statistics

Call Statistics are generated by the unit to allow you to track specific events that occur during the course of a call. While these statistics are not an error in and of themselves, they may indicate that an error has occurred.

The AM2-D/De Script Source Files are listed below. Each Source File (Script) has its Call Statistic Data Register Codes listed in Table 3.

9320000	A -> B	
9320001	A -> B ; B -> A	
9320002	UNPR ORG	
9320003	UNPR TERM	
9320004	R2 T UNPR	(AM2-De only)
9320005	R2C/TT ORIG	(AM2-De only)
9320015	Unpaired Terminate Wink	
9320016	BERT ORIG	
9320017	BERT TERM	

9320018	BERT R2 T	(AM2-De only)
9320022	Voice Demo	
9320053	NCS_ORG	
9320054	NCS_TRM	
9320087	Switching (In -> Out)	(AM2-D only)
9320089	Switch R2	(AM2-De only)
9327001	A Calls B Std ScriptMate	
9327002	A Calls B ; B Calls A ScriptMate	
9327003	Unpaired Originate ScriptMate	
9327004	Unpaired Terminate ScriptMate	
9327005	Originate BERT ScriptMate	
9327006	Terminate Bert Scriptmate	
9327025	R2 Terminate Standard ScriptMate	(AM2-De only)
9327028	A Calls B Std QwikScript	
9327029	A Calls B ; B Calls A QwikScript	
9327030	Unpaired Originate QwikScript	
9327031	Unpaired Terminate QwikScript	
9327046	Analog and CAS Origination VOP Trip Delay	
9327063	Analog and CAS Originate then Terminate	
9327064	Analog and CAS Terminate then Originate	
9327065	NCS Originate then Terminate	
9327066	NCS Terminate then Originate	
9327079	Unpaired Originate VoP Call with 1-Way Delay	
9327080	Unpaired Terminate VoP Call with 1-Way Delay	
9327081	Unpaired Originate VoP Call with Signal Analysis	
9327082	Unpaired Terminate VoP Call with Signal Analysis	
9327083	A Calls B Paired VoP Call with Signal Analysis	
9327084	A Calls B; B Calls A Paired VoP Call with Signal Analysis	
9327085	A Calls B Paired VoP Call with 1-Way Delay	
9327086	A Calls B; B Calls A Paired VoP Call with 1-Way Delay	
9327088	Analog and CAS Unpaired Terminate VoP Trip Delay	
9327093	A Calls B VoP Paired Call w/Round Trip Delay	
9327094	A Calls B; B Calls A VoP Paired Call with Round Trip Delay	

9327103	Unpaired R2 CAS Terminate Call with Round Trip Delay Test	(AM2-De only)
9327104	Unpaired R2 CAS Terminate Call with 1-Way Delay Test	(AM2-De only)
9327105	Unpaired R2 CAS Terminate Call with VoP Signal Analysis	(AM2-De only)
9327114	CAS Unpaired Terminate Match	
9327115	CAS A Calls B Match Std	
9327116	CAS A Calls B; B Calls A Match Std	
9327125	Analog & CAS Voice Replay Terminate	
9327131	Analog/CAS Unpaired Originate VOP II Dropout	
9327132	Analog/CAS Unpaired Terminate VOP II Dropout	
9327133	Unpaired R2 Terminate VOP II Dropout	
9327154	Analog & CAS Originate VoP Detection	
9327155	Analog & CAS Terminate VoP Detection	
9327158	Analog & CAS A Calls B	
9327159	Analog & CAS A Calls B; B Calls A	
9329007	Calling Card Script	

Table A-3. Call Statistic Data Register Codes

Code	Statistic	Script	Definition
1	ORIG ATTEMPT	9320000, 9320001, 9320002, 9320005, 9320016, 9320022, 9320053, 9320087, 9320089, 9327001, 9327002, 9327003, 9327005, 9327028, 9327029, 9327030, 9327046, 9327063, 9327064, 9327065, 9327066, 9327079, 9327081, 9327083, 9327084, 9327085, 9327086, 9327093, 9327094, 9327115, 9327116, 9327131, 9327154, 9327158, 9327159, 9329007	Counts each call attempt that a specific terminal attempts to initiate, regardless of the success of the call.
2	ORIG COMPL	9320000, 9320001, 9320002, 9320005, 9320016, 9320022, 9320053, 9320087, 9320089, 9327001, 9327002, 9327003, 9327005, 9327028, 9327029, 9327030, 9327046, 9327063, 9327064, 9327065, 9327066, 9327079, 9327081, 9327083, 9327084, 9327085, 9327086, 9327093, 9327094, 9327115, 9327116, 9327131, 9327154, 9327158, 9327159, 9329007	Counts each successful completion of a call for each terminal listed.

Code	Statistic	Script	Definition
3	AVG START DELAY	9320000, 9320001, 9320002, 9320005, 9320016, 9320053, 9320054, 9320087, 9320089, 9327001, 9327002, 9327003, 9327005, 9327028, 9327029, 9327030, 9327046, 9327063, 9327064, 9327065, 9327066, 9327079, 9327081, 9327083, 9327084, 9327085, 9327086, 9327093, 9327094, 9327115, 9327116, 9327154, 9329007	The average time from an off hook or start signal to detection, for completed calls only.
4	SLOW START	9320000, 9320001, 9320002, 9320005, 9320016, 9320054, 9320087, 9320089, 9327001, 9327002, 9327003, 9327005, 9327028, 9327029, 9327030, 9327046, 9327063, 9327064, 9327065, 9327066, 9327079, 9327081, 9327083, 9327084, 9327085, 9327086, 9327093, 9327094, 9327115, 9327116, 9327154, 9329007	The SLOW START register increments each time an originating call doesn't receive a Layer 2 acknowledgment within the time set in the st_sig_delay parameter. The register only increments when the time received is before the time set in the st_sig_fail parameter.
5	NO START	9320000, 9320001, 9320002, 9320005, 9320016, 9320054, 9320087, 9327001, 9327002, 9327003, 9327005, 9327028, 9327029, 9327030, 9327046, 9327063, 9327064, 9327065, 9327066, 9327079, 9327081, 9327082, 9327083, 9327084, 9327085, 9327086, 9327093, 9327094, 9327115, 9327116, 9327154, 9329007	The number of times that an originating call doesn't receive a start signal within the st_sig_fail time.
6	NO ALERT	9320000, 9320001, 9320003, 9320015, 9320017, 9320054, 9327001, 9327002, 9327004, 9327006, 9327028, 9327029, 9327031, 9327063, 9327064, 9327065, 9327066, 9327080, 9327083, 9327084, 9327085, 9327086, 9327088, 9327093, 9327094, 9327125, 9327132, 9327133, 9327158, 9327159	The number of times that a call progresses to the point that the called line expects a connection and doesn't get it.
7	AVG PD DELAY	9320000, 9320001, 9320002, 9320005, 9320016, 9320087, 9327001, 9327002, 9327003, 9327005, 9327028, 9327029, 9327030, 9327063, 9327064, 9327065, 9327066, 9327115, 9327116, 9327158, 9327159, 9329007	The average time from end of dialing until the CONNECT message is detected.
8	NO CONFRM	9320000, 9320001, 9320002, 9320003, 9320004, 9320005, 9320015, 9320016, 9320053, 9320054, 9320087, 9327001, 9327002, 9327003, 9327004, 9327005, 9327028, 9327029, 9327030, 9327031, 9327046, 9327063, 9327064, 9327065, 9327066, 9327079, 9327080, 9327081, 9327083, 9327084, 9327085, 9327086, 9327088, 9327093, 9327094, 9327103, 9327104, 9327114, 9327115, 9327116, 9327154, 9327155, 9329007	Increments each time the voice path verification check fails. For SENDID or RECVID token counts when the tone was not received or not received within the time set in the confirm_time parameter.

Code	Statistic	Script	Definition
9	CALLED BUSY	9320000, 9320001, 9320002, 9320005, 9320087, 9327001, 9327002, 9327003, 9327028, 9327029, 9327030, 9327063, 9327079, 9327081, 9327083, 9327084, 9327085, 9327086, 9327093, 9327094	The number of calls that busy signal was detected by the calling line after dialing all digits and waiting the "timeout" period.
10	NO ANS SIGNAL	9320000, 9320001, 9320002, 9320005, 9320016, 9320053, 9320054, 9327001, 9327002, 9327003, 9327005, 9327025, 9327028, 9327029, 9327030	Increments each time a calling line/channel does not receive an answer signal.
10	NO ANS SIGNAL	9327063, 9327064, 9327065, 9327066, 9327115, 9327116, 9329007	The number of calls that reverse battery was not detected at the end of the voice path confirmation check with detection enabled.
11	TERM ATTMPT	9320000, 9320001, 9320003, 9320004, 9320015, 9320017, 9320018, 9320053, 9320054, 9320087, 9320089, 9327001, 9327002, 9327004, 9327006, 9327025, 9327028, 9327029, 9327031, 9327063, 9327064, 9327065, 9327066, 9327080, 9327082, 9327083, 9327084, 9327085, 9327086, 9327088, 9327093, 9327094, 9327103, 9327104, 9327105, 9327114, 9327115, 9327116, 9327125, 9327132, 9327133, 9327155, 9327158, 9327159	Increments each time a terminate line acknowledges that it is receiving a setup message. Will count even if the call attempt is not completed.
12	TERM COMPL	9320000, 9320001, 9320003, 9320004, 9320015, 9320017, 9320018, 9320053, 9320054, 9320087, 9320089, 9327001, 9327002, 9327004, 9327006, 9327025, 9327028, 9327029, 9327031, 9327063, 9327064, 9327065, 9327066, 9327080, 9327082, 9327083, 9327084, 9327085, 9327086, 9327088, 9327093, 9327094, 9327103, 9327104, 9327105, 9327114, 9327115, 9327116, 9327125, 9327132, 9327133, 9327155, 9327158, 9327159	Increments each time the called line answers an incoming call and verifies the voice path.
13	RING TIMOUT	9320053	Code 13 has a header of RING TIME-OUT and will generate a Real Time Error report each time it is reported.
13	CODE 13	9327065, 9327066	This alert indicates a data packet comparison failure. While comparing the Offhook data packets, a comparison failed on a particular data string. n indicates the particular string.
14	NO CONNECT	9320054, 9320089, 9327065, 9327066	Increments when no CONNECT message is received for Voice or Data calls.

Code	Statistic	Script	Definition
15	CODE 15	9320054, 9327066	Increments each time a RELEASE COMPLETE message was not received. Statistics will still show a call completion.
17	CODE 17	9320053, 9327065	Reports an error in clearing the call. Statistics will still show a call completion.
20	CODE 20	9327114, 9327115, 9327116	The number of calls that did not meet expected digit criteria.
2000	AVER_ DROP_ DUR	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Average Dropout Duration. A running average of the dropout duration in milliseconds.
2001	MAX_ DROP_ DUR	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Maximum Dropout Duration. Reports the maximum dropout duration in milliseconds.
2002	DROPOUT _BIN1	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Dropout Bin 1 Counts. 10 - counts the number of calls that had between 0 and 10 dropouts.
2003	DROPOUT _BIN2	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Dropout Bin 2 Counts. 20 - counts the number of calls that had between 11 and 20 dropouts.
2004	DROPOUT _BIN3	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Dropout Bin 3 Counts. 50 - counts the number of calls that had between 21 and 50 dropouts.
2005	DROPOUT _BIN4	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Dropout Bin 4 Counts. 100 - counts the number of calls that had between 51 and 100 dropouts.
2006	DROPOUT _BIN5	9327081, 9327083, 9327084, 9327131, 9327158, 9327159	Dropout Bin 5 Counts. Counts the number of calls that had over 100 dropouts.
2010	AVER_ FCLIP_ DUR	9327081, 9327083, 9327084	Average Leading-Edge Clip Duration. A running average of the leading-edge clipping duration in milliseconds.

Code	Statistic	Script	Definition
2011	MAX_ FCLIP_ DUR	9327081, 9327083, 9327084	Maximum Leading-Edge Clip Duration. Reports the maximum leading-edge clipping duration in milliseconds.
2012	FCLIP_ BIN1	9327081, 9327083, 9327084	Leading-Edge Clip Bin 1 Counts. 10 - counts the number of calls that had between 0 and 10 leading-edge clips.
2013	FCLIP_ BIN2	9327081, 9327083, 9327084	Leading-Edge Clip Bin 2 Counts. 20 - counts the number of calls that had between 11 and 20 leading-edge clips.
2014	FCLIP_ BIN3	9327081, 9327083, 9327084	Leading-Edge Clip Bin 3 Counts. 50 - counts the number of calls that had between 21 and 50 leading-edge clips.
2015	FCLIP_ BIN4	9327081, 9327083, 9327084	Leading-Edge Clip Bin 4 Counts. 100 - counts the number of calls that had between 51 and 100 leading-edge clips.
2016	FCLIP_ BIN5	9327081, 9327083, 9327084	Leading-Edge Clip Bin 5 Counts. Counts the number of calls that had over 100 leading-edge clips.
2020	AVER_ BCLIP_ DUR	9327081, 9327083, 9327084	Average Trailing-Edge Clip Duration. A running average of the trailing-edge clipping duration in milliseconds.
2021	MAX_ BCLIP_ DUR	9327081, 9327083, 9327084	Maximum Trailing-Edge Clip Duration. Reports the maximum trailing-edge clipping duration in milliseconds.
2022	BCLIP_ BIN1	9327081, 9327083, 9327084	Trailing-Edge Clip Bin 1 Counts. 10 - counts the number of calls that had between 0 and 10 trailing-edge clips.
2023	BCLIP_ BIN2	9327081, 9327083, 9327084	Trailing-Edge Clip Bin 2 Counts. 20 - counts the number of calls that had between 11 and 20 trailing-edge clips.

Code	Statistic	Script	Definition
2024	BCLIP_ BIN3	9327081, 9327083, 9327084	Trailing-Edge Clip Bin 3 Counts. 50 - counts the number of calls that had between 21 and 50 trailing-edge clips.
2025	BCLIP_ BIN4	9327081, 9327083, 9327084	Trailing-Edge Clip Bin 4 Counts. 100 - counts the number of calls that had between 51 and 100 trailing-edge clips.
2026	BCLIP_ BIN5	9327081, 9327083, 9327084	Trailing-Edge Clip Bin 5 Counts. Counts the number of calls that had over 100 trailing-edge clips.
2030	AVER_ JITTER	9327081, 9327083, 9327084	Average Jitter Duration. Records the average jitter duration in milliseconds.
2031	MAX_ JITTER	9327081, 9327083, 9327084	Maximum Jitter Duration. Records the maximum jitter duration in milliseconds.
2100	AVER_ DELAY	9327079, 9327080, 9327085, 9327086, 9327104	The number of calls that the calling line goes off hook to initiate a call and was allowed to go back on hook without manual intervention (unit placed in stop mode).
2101	MIN_ DELAY	9327079, 9327080, 9327085, 9327086, 9327104	Will increment its count, up to 50000, each time the call between the two lines is complete, including voice path verification and answer supervision check, if enabled.
2102	MAX_ DELAY	9327079, 9327080, 9327085, 9327086, 9327104	The average time from off hook to detection of dial tone on the calling line.
2103	DELAY_ BIN_1	9327079, 9327080, 9327085, 9327086, 9327104	1-Way Delay Bin 1 Counts. 100 - counts the number of calls where the one-way delay is less than 100 milliseconds.
2104	DELAY_ BIN_2	9327079, 9327080, 9327085, 9327086, 9327104	1-Way Delay Bin 2 Counts. 200 - counts the number of calls where the one-way delay is between 101 and 200 milliseconds.

Code	Statistic	Script	Definition
2105	DELAY_ BIN_3	9327079, 9327080, 9327085, 9327086, 9327104	1-Way Delay Bin 3 Counts. 300 - counts the number of calls where the one-way delay is between 201 and 300 milliseconds.
2106	DELAY_ BIN_4	9327079, 9327080, 9327085, 9327086, 9327104	1-Way Delay Bin 4 Counts. 400 - counts the number of calls where the one-way delay is between 301 and 400 milliseconds.
2107	DELAY_ BIN_5	9327079, 9327080, 9327085, 9327086, 9327104	1-Way Delay Bin 5 Counts. Counts the number of calls where the one-way delay is greater than 401 milliseconds.
2110	TRIP_ AVER	9327088, 9327093, 9327094, 9327103	Average Round Trip Delay. Reports the average Round-Trip delay in milliseconds.
2111	MIN_TRIP_ DELAY	9327088, 9327093, 9327094, 9327103	Minimum Round Trip Delay. Reports the minimum Round-Trip delay in milliseconds.
2112	MAX_TRIP _DELAY	9327088, 9327093, 9327094, 9327103	Maximum Round Trip Delay. Reports the maximum Round-Trip delay in milliseconds.
2113	TRIP_ BIN_1	9327088, 9327093, 9327094, 9327103	1-Way Delay Bin 1 Counts. 100 - counts the number of calls where the Round-Trip delay is less than 100 milliseconds.
2114	TRIP_ BIN_2	9327088, 9327093, 9327094, 9327103	1-Way Delay Bin 2 Counts. 200 - counts the number of calls where the Round-Trip delay is between 101 and 200 milliseconds.
2115	TRIP_ BIN_3	9327088, 9327093, 9327094, 9327103	1-Way Delay Bin 3 Counts. 300 - counts the number of calls where the Round-Trip delay is between 201 and 300 milliseconds.
2116	TRIP_ BIN_4	9327088, 9327093, 9327094, 9327103	1-Way Delay Bin 4 Counts. 400 - counts the number of calls where the Round-Trip delay is between 301 and 400 milliseconds.

Code	Statistic	Script	Definition
2117	TRIP_ BIN_5	9327088, 9327093, 9327094, 9327103	1-Way Delay Bin 5 Counts. Counts the number of calls where the Round-Trip delay is greater than 401 milliseconds.
8001	No Tone Detected	9327131, 9327158, 9327159	Counts the number of times the call failed due to the incoming tone not being detected by the vop_timeout.
8004	Tone Lost	9327131, 9327158, 9327159	Counts the number of times the call failed due to losing the incoming tone before the test_time parameter expires.

A.1.3.1 Supplemental Report Statistic Information

This section provides additional information on the use and meanings of Call Statistics Report (and error message data) which may be programmed into a Script.

A.1.3.1.1 ORIG ATTEMPT

The number of calls that the calling line goes off hook to initiate a call and was allowed to go back on hook without manual intervention (unit placed in stop mode). It counts each occurrence of an OFFHOOK instruction by the originating line regardless of the success of the call.

A.1.3.1.2 ORIG COMPL

Will increment its count, up to 50000, each time the call between the two lines is complete, including voice path verification, if enabled. It counts the number of times the programmed sequence was successful in running through its complete test. If this does not increment once per ORIG ATTEMPT, you may see any of the following codes. The code received will help you identify the fault.

A.1.3.1.3 AVG START DELAY

The average time from offhook to detection of dial tone on the calling line for calls that complete, only. This code displays the average start dial delay for the assigned line. Each factory script will get a time stamp at offhook then another at the time the start dial signal arrives (or the line times out) and writes the difference to a register, which is then divided by the number of times the line reported the code, for an average delay.

A.1.3.1.4 SLOW START

The number of calls that an originating call doesn't receive dial tone within the st_sig_dly time. This will only count if dial tone is eventually received within the st_sig_fail time. This code represents a slow start signal on an originate line. The protocol has not detected dial-tone (or seize acknowledge) in the delay time-out set by the st_sig_dly parameter. The number within the real time error reports represents (in 100ms increments) the time from offhook until the start signal was received.

A.1.3.1.5 NO START

The number of times that an originating call doesn't receive dial tone within the st_sig_fail time. This code represents no start signal on an originate line. The protocol has not detected dial-tone (or seize acknowledge) in the fail time-out set by the st_sig_fail parameter. The number within the real time error reports represents (in 100ms increments) the time from offhook until the start signal timed out.

A.1.3.1.6 NO ALERT

The number of times that a call progresses to the point that the called line expects ringing and doesn't get it. This code represents no alert on a terminate line. The protocol has not detected a ring (or seize) within the fail time-out set by the timeout parameter for the first ring (paired operation only) or, subsequent ring signals were not present before the ring_cycle parameter time-out. The number within the real time error reports represents the number of rings that were detected before the time-out occurred.

This code is normally used on paired operations such as A Calls B and A Calls B ; B Calls A Scripts. It is reported from the Call Program when the terminating line which is expecting a call from the originating line did not receive an ALERT signal (signal Code 101) from the protocol.

This condition indicates that there is a problem in the line signaling system.

A.1.3.1.7 AVG PD DELAY

The average time from end of dialing until the first ring is detected on the called line for completed calls only. This code provides an average time (100ms resolution) from the last digit sent until ring (or seize) is detected on the terminate port (paired only) or SENDID is detected (unpaired only). Like Code 3, time stamps are used to determine the elapsed time, and then averaged.

A.1.3.1.8 NO CONFRM

The number of calls that the voice path verification check failed. This code represents a failure in the confirming path check between lines.

Path confirmation is usually done by the sequences initiated by the SENDID/RECVID instructions in the Call Program. In this sequence, one party sends a tone sequence and the other party sends an acknowledge tone after it has received and checked the ID. The sequence continues through a programmed conversation time.

If the failure is from a RECVID (usually the originate line) instruction, the ID sent either did not match what it was told it would receive in the ID parameter, or it passed the fail time-out set in the confirm_time parameter. If the failure is from a SENDID (usually the terminate line) instruction, either the 900Hz confirmation from the RECVID was not received, or it passed the fail time-out set in the confirm_time parameter. The number within the real time error reports represents (in 100ms increments) the elapsed time of the conversation before the failure occurred.

A.1.3.1.9 CALLED BUSY

The number of calls that a busy signal was detected by the calling line after dialing all digits and waiting the timeout period. This code represents a busy signal (either fast busy or slow busy) detected on the line. The number within the real time error reports represents the type of busy signal detected (60 for slow or called subscriber busy and 120 for fast busy or congestion).

This code is usually reported from the originating Call Program to indicate that the called party is busy. Usually the protocol detects the busy conditions on the line, and sends a busy signal (signal Code 113) to the Call Program.

A.1.3.1.10 NO ANS SIGNAL

The number of calls that an answer signal was not detected at the end of the voice path confirmation check. The number within the real time error reports represents (in 100ms increments) the elapsed time of the conversation before the failure occurred.

This code is usually reported from the originating Call Program to indicate that the called party did not answer the call. Usually the protocol detects a "far-end-answer" condition on the line and sends an answer signal (signal Code 103) to the Call Program.

The Call Program reports NO ANS SIGNAL if the signal Code 103 is not received within a certain time limit.

A.1.3.1.11 TERM ATTMPT

The number of calls that the called line goes off hook as a result of receiving the appropriate number of rings. This code will count the number of times the specified line has detected an incoming call and the programmed number of expected rings, then gone offhook regardless of the success of the call.

A.1.3.1.12 TERM COMPL

The number of calls that the called line answered an incoming call and verified the voice path. This code counts the number of calls successfully answered by the specified terminate line. When operating in a paired mode, it is possible to have a TERM COMPLete and not an ORIG COMPLete if the originate line is expecting answer supervision and it is not present. In this case, Code 10 will count. When running unpaired, it is possible to have a TERM COMPLete and not an ORIG COMPLete if the specified terminate line is successful in completing its SENDID function. It does not require the originating line to send a SENDID.

A.1.3.1.13 CODE X (14 - 32)

These codes have been provided so you may customize your scripts to allow reporting of required events. Code 14 thru 32 will have the header of Codexx and do not produce real time error reports. Codes 27 thru 30 are accumulators, and Codes 31 and 32 are average registers.

Table A-4. Call Statistic Report Codes

Report Name	Code	Report Heading	RT Msg	Count	Accum.	Avg.
-	0	none		X	-	-
R_ATTEMPT	1	ORIG ATTEMPT		X	-	-
R_COMPLETE	2	ORIG COMPL		X	-	-
R_START	3	AVG ST DELAY		-	-	X
R_SLOWSTART	4	SLOW START	X	X	-	-
R_NOSTART	5	NO START	X	X	-	-
R_NOALERT	6	NO ALERT	X	X	-	-
R_PDTIME	7	AVG PD DELAY		-	-	X

Report Name	Code	Report Heading	RT Msg	Count	Accum.	Avg.
R_NOCONF	8	NO CONFRM	X	X	-	-
R_BUSY	9	CALLED BUSY	X	X	-	-
-	10	NO ANS SIGNAL	X	X	-	-
-	11	TERM ATTMPT		X	-	-
-	12	TERM COMPL		X	-	-
-	13	RING TIMOUT	X	X	-	-
-	14	CODE 14		X	-	-
	• • •	(first and last of series shown)		X		
-	26	CODE 26		X	-	-
-	27	CODE 27		-	X	-
-	28	CODE 28		-	X	-
-	29	CODE 29		-	X	-
-	30	CODE 30		-	X	-
-	31	CODE 31		-	-	X
-	32	CODE 32		-	-	X

Text in **Report Heading** column appears (on two 6-character lines) in the displayed/printed header of the Statistical Report. An "X" in the RT MSG column means that a Real Time Error Message is also generated by default. In writing CODE instructions, use the Code number unless the Report Name has been defined as a constant in the # VARIABLES section of the script. The X's are default assignments.

X in the **Count** column indicates that the current number of code occurrences of the event is placed in the field (max. = 50000).

X in the **Accum** column indicates that the Accumulated-value in the variable is placed in the field (max. value = 9999999).

X in the **Avg.** column indicates that the Accum-value of the variable is divided by the count-value of the event divided by 10 (to convert the counts/100ms to counts/sec.). This result is placed in the field (max. value = 65535.0).

The maximum field width, including decimal point and leading blanks = 8 characters

If a maximum value is exceeded, the field is filled with stars "********"

A.1.4 Signal Names and Codes

Table A-5 lists the Signal Names and Codes. Signals are seen by the WAIT and IF.SIG instructions as simple "yes/no" indications that are passed out of the instructions that use the signals. WAIT and/or IF.SIG instructions are provided to test for a returned code:

- The WAIT instruction tests for a signal code from a channel within periods set by delay or fail time parameters. A DELAY Flag or FAIL Flag is set if delay or fail time is exceeded. These flags may then be tested by IF.DELAY and/or IF.FAIL instructions.
- The IF.SIG instruction tests only for the return of a signal code from a channel, either as a result of a previous instruction, or from an external event detected by the channel.

Up to eight different signals can be stored at any time during Call Program execution. If a signal that is already present occurs again, it replaces the previous occurrence of the signal.

All signals can be cleared (set to NO) by the CLRSIGS instruction, or automatically after being detected by a WAIT or IF.SIG instruction.

Table A-5. Signal Value Names and Codes

Signal Name	Code	Meaning
SIG_ALERT	101	Alert (incoming call)
SIG_STARTDIAL	102	Start Dial (Dial tone, wink, etc.)
SIG_ANSWER	103	Far-end answer detected (offhook)
SIG_ABANDON	104	Ringing abandoned
SIG_DISCONNECT	105	Caller disconnected
SIG_SEIZE	106	Seize from network
SIG_STARTDIALb	107	Not used on AM2/CRS
SIG_ENDSEL	108	End of selection received from network
SIG_FAIL	109	Fail (sometimes due to timeout)
SIG_DONE	110	General done
SIG_BADACK	111	Bad (unexpected) backward MF(R2) digit

Signal Name	Code	Meaning
SIG_RELEASE	112	Line has been released (onhook)
SIG_BUSY	113	Called subscriber (B-3)
SIG_SZAK	114	Seize (ACK) from R2 originate channel
SIG_BUSY1	115	Fast Busy
SIG_BUSY2	116	Slow Busy
SIG_DSPLUPD	117	Display Updated (-P units only)
SIG_BERT_NOS	117	BERT pattern not received (D/De/DX/DXe/S7/S7e only)
SIG_BERT_LOS	118	BERT pattern lost (D/De/DX/DXe/S7/S7e only)
SIG_OFFHK	119	Offhook completed (-P units only)
SIG_RCVDGT	119	Enough incoming digits received to answer call. (S7/S7e only)
SIG_RESTART	119	Restart/Restart Ack received (ISDN only)
SIG_ONHK	120	Onhook completed (-P units only)
SIG_CLRREQ	120	X.25 Clear Request received (ISDN only)
SIG_DISCX25	121	X.25 L2 disconnected (ISDN only)
SIG_CLRCONF	122	X.25 Clear Confirm received (ISDN only)
SIG_RINGBACK	123	Ringback received
SIG_KEYSU	124	Key Setup received (-B units only)
SIG_KEYHOLD	125	Key Hold received (-B units only)
SIG_RTRVACK	126	Retrieve Ack received (-B units only)
SIG_READY4L2	127	Layer 1 is active and Switch is ready for Layer 2 (-B units only)
SIG_BUZZON	127	EV_BUZZON received (-P units only)
SIG_BUZZOFF	128	EV_BUZZOFF received (-P units only)
SIG_MTRPULSE	179	Meterpulse detected
SIG_USR1	231	User defined signal
SIG_CONNECT	232	Connect Message received (ISDN only)
SIG_CONNACK	233	Connect Ack Message received (ISDN only)
SIG_ACM	232	Address Complete Message received (S7/S7e only)
SIG_ANM	233	Answer Message received (S7/S7e only)

Note: Signal Names may not apply to all scripts. Use the Code as a numeric argument value in WAIT or IF.SIG instructions or use a Signal Name that has been defined in the # VARIABLES section (e.g., SIG_FAIL & 109).

A.1.5 Unit Error Messages

Unit error messages are rare. They are displayed when a Call Generator system-level software problem occurs. The system may stop responding after the occurrence of a unit level message. Recycling unit power usually corrects the problem. Table A-6 lists each message.

Table A-6. Unit Error Messages

MESSAGE	Meaning of message
FATAL INTERNAL ERROR 10	Unit has stopped due to a list processing error. This error and FATAL INTERNAL ERROR 31 indicate a corrupt program.
FATAL INTERNAL ERROR 31	Unit has stopped due to a message-queue posting error.
INTERNAL DIAGNOSTIC 11	This error indicates an unexpected condition in the software. Its meaning varies with the operations being performed and the version of software running. If this message is displayed, please contact Customer Service.
INTERNAL DIAGNOSTIC 12	This error indicates that a file with an illegal file type was loaded into the AM2 via the RS-232 serial port. The file was not saved, since the AM2 could not interpret the file.
INTERNAL DIAGNOSTIC 28	An unrecognized message between processors inside the AM2 produces this message. The possible cause is incompatible software in different processors in the unit.

B.1 Appendix B: Extended Reporting

The Extended Report Code Feature enables the user to create his or her own report headings as well as generate User-Defined Real Time Codes. This allows users to define their own report codes. The following code types are available with Extended Reporting:

- Average
- Aver100Ms
- Accumulator
- Counter
- Maximum
- Minimum
- Real Time Code

This appendix covers:

- Minimum Host and Firmware Requirements for Extended Report Codes
- Overview of Standard Reporting
- Overview of Extended Reporting
- Modifying Scripts to Include Extended Reporting using ScriptMate®
- Modifying Scripts to Include Extended Reporting using a Text Editor
- Once the Script is Downloaded

B.1.1 Minimum Host & Firmware Requirements for Extended Report Codes

The Extended Report Code Feature was implemented through a combination of FeatureCall, Host, LGC, and DCC firmware. All new units shipped support this feature, since they have the most current version of firmware. Older units that have been updated to support VoP II also include support for Extended Reporting. Contact customer support and supply the serial number to find out the current revision of the unit's firmware.

Note: Extended Reporting is available to Analog, PRI, and SS7 bulk call generators. Extended Reporting is not available on any other bulk call generator models.

FeatureCall

The minimum FeatureCall version for extended codes is 3.60 for all models.

Host

The minimum host requirement for extended codes is 4.77A for all models.

T1 CAS LGC

The minimum Line Group Controller (LGC) requirement for the T1 CAS unit with hardware revision G or earlier is 912313113B.

The minimum Line Group Controller (LGC) requirement for the T1 CAS unit with hardware revision H or current is 912312113B.

Note: The LGC hardware must be set up for 64K.

E1 CAS LGC

The minimum Line Group Controller (LGC) requirement for the E1 CAS unit is 912322113B.

Note: The LGC hardware must be set up for 64K.

B.1.2 Overview of Standard Reporting

The following script code block causes a Standard Report to be generated on the specified channel.

```
REPORT channel
  CODE code# register
END
```

code#

The code# parameter defines which code will be reported. The code can be defined within the report block or in the #VARIABLES section of the script. The following report blocks will report an ORIG ATTEMPT and an ORIG COMPL.

SET #z 0 REPORT channel CODE R_ATTEMPT #z CODE R_COMPLETE #z END #VARIABLES R_ATTEMPT & 1 R_COMPLETE & 2	SET #z 0 REPORT channel CODE 1 #z CODE 2 #z END There is no need to define the codes in the #VARIABLES section if they are already defined within the report block.

Once the Report block has been included in the script, it must be defined in the #VARIABLES section of the script. The #VARIABLES section is located at the bottom of the script.

There are two steps to add Standard reporting:

1. Add a Report Block in the script.
2. Define the codes in the variable section or within the Report Block.

The Standard Report Codes must be in the range of 1-255. See Table B-1 for the code names.

Registers

The register can be used to contain data significant to the reported code (e.g., elapsed time, number of BERT errors, etc.). The register value is meaningful for any codes that generate **Minimum**, **Maximum**, **Average**, **Accumulator**, and/or **Real Time** codes. Even if a value is not meaningful, it still must be specified. Note in the script example that the register "z" is set to zero. Code 1 and 2 are counters; therefore, the register value is not used.

Tables B-1 and B-2 list the Standard Report Codes. Note that there are 255 codes available for the Standard Reports. Some of the 255 codes are pre-defined, and some will generate a generic code (e.g., Code 26).

Table B-1. Report Codes for Call Statistics

Report Name	Code	Report Heading	RT Msg	Count	Accum.	Avg.
-	0	none		X	-	-
R_ATTEMPT	1	ORIG ATTEMPT		X	-	-
R_COMPLETE	2	ORIG COMPL		X	-	-
R_START	3	AVG ST DELAY		-	-	X
R_SLOWSTART	4	SLOW START	X	X	-	-
R_NOSTART	5	NO START	X	X	-	-
R_NOALERT	6	NO ALERT	X	X	-	-
R_PDTIME	7	AVG PD DELAY		-	-	X
R_NOCONF	8	NO CONFRM	X	X	-	-
R_BUSY	9	CALLED BUSY	X	X	-	-
-	10	NO ANS SIGNAL	X	X	-	-
-	11	TERM ATTMPT		X	-	-
-	12	TERM COMPL		X	-	-
-	13	RING TIMOUT	X	X	-	-
-	14	CODE 14		X	-	-
	• • •	(first and last of series shown)		X		
-	26	CODE 26		X	-	-
-	27	CODE 27		-	X	-
-	28	CODE 28		-	X	-
-	29	CODE 29		-	X	-
-	30	CODE 30		-	X	-
-	31	CODE 31		-	-	X
-	32	CODE 32		-	-	X

Text in **Report Heading** column appears in the displayed/printed header of the Statistical Report. An "X" in the RT MSG column means that a Real Time Error Message is also generated by default.

In writing CODE instructions, use the Code number unless the Report Name has been defined as a constant in the # VARIABLES section of the script. The X's are default assignments.

Report Name	Code	Report Heading	RT Msg	Count	Accum.	Avg.
X in the **Count** column indicates that the current number of code occurrences of the event is placed in the field (max. = 50000).						
X in the **Accum** column indicates that the Accumulated-value in the register is placed in the field (max. value = 9999999).						
X n the **Avg.** column indicates that the Accum-value of the register is divided by the count-value of the event divided by 10 (to convert the counts/100ms to counts/sec.). This result is placed in the field (max. value = 65535.0).						
The maximum field width, including decimal point and leading blanks = 8 characters If a maximum value is exceeded, the field is filled with stars "********"						

Table B-2. Real Time Error Report Messages

Report Name	Code	Message Text	Report
R_SLOWSTART	4	004 Slow Start Signal x	SLOW START
R_NOSTART	5	005 No Start Signal x	NO START
R_NOALERT	6	006 No Alert Signal x	NO ALERT
R_NOCONF	8	008 Confirming Failure x	NO CONFRM
R_BUSY	9	009 Called Subs Busy x	CALLED BUSY
—	10	010 No Answer Signal x	NO ANS SIGNAL
—	13	013 Ring Timeout x	RING TIMOUT
R_A1 • • • • R_A15	33 • • • 47	033 R2 A1 Received 0 047 R2 A15 Received 0	(first and last of series shown)
R_B1 • • • • R_B15	48 • • • 62	048 R2 B1 Received 0 062 R2 B15 Received 0	(first and last of series shown)
NOSZAK	63	063 No Seize Ack	Internal error
—	240	Power Lost 0	Internal error
—	241	Power Restored 0	Internal error
—	242	Start Sets s	Internal error. s=1-4
—	243	Finished Set s	Internal error. s=1-4
—	244	Stopped Set s	Internal error. s=1-4
—	245	Stopped on Trouble s	Internal error. s=1-4
—	246	Lost Real Time Reports r	Internal error. r = number lost
—	247	Code is unassigned	Internal error
—	248	Invalid Ch Assgn*	X = 1 - Call Program Assignment Err X = 2 - Audio Monitor Assignment Err
—	249	Code is unassigned	Internal error
R_GDSPERR	250	Global DSP error	

Report Name	Code	Message Text	Report
R_PSTERR	251	Protocol Error*	x=state number/unexpected event number.
R_INTRERR	252	Cause Code*	x=cause code.
R_RMError	253	Layer 1 ACT Error*	(BRI Only)
R_CPError	254	Call Prog Error	x=the offset into the Call Program where an error has occurred **or** -1 if out of memory on LGC when trying to download a new Call Program.
R_SYSERR	255	255 System Error y	

Any code over 32 automatically generates a Real Time Error message.

Any codes up to 32 may also be specified for Statistics Display/Statistical Report.

The register ("y") follows the message text for System Error. Names in Report column are default report-column headings for all units.

* Units with older versions of Host Software will have "Code is Unassigned" as the text.

B.1.3 Overview of Extended Reporting

The following instruction causes an Extended Report to be generated on the specified channel.

```
EXREPORT channel
  EXCODE code# register
END
```

code#

The code# parameter specifies what will be reported. The code can be defined within the report block or in the #VARIABLES section of the script.

The following Extended Report block will report a user defined code.

SET #z 0 EXREPORT channel EXCODE R_CODE #z END	SET #z 0 EXREPORT channel EXCODE 1001 #z END
If the code is defined within the report block, it does not need to be defined in the #VARIABLES section. #VARIABLES R_CODE & 1001 #REPORT TITLE “Report User Code” CODE R_CODE COUNTER REALTIME “User Defined Report Heading” #END	

Once the EXREPORT block has been included in the script, the parameter name must be defined in the #VARIABLES section. The range of Extended Codes must be from 256-65535. Once the code has been defined in the #VARIABLES section, the report title, code value, and code heading must be defined. If using ScriptMate, this is done by selecting Define Report Format under the Tools drop down menu. If using a text editor, you must manually define it in the #REPORT section.

There are three steps to add Extended Reporting:

1. Add a Report Block in the script.
2. Define the codes in the VARIABLES section or within the Report Block.
3. Define the code type as a COUNTER, AVERAGE, AVER100MS, ACCUMULATOR, MAXIMUM, MINIMUM, and REALTIME in the column heading. This is defined in the REPORT section or via Define Report Format if using ScriptMate.

Registers

The register can be used to contain data significant to the reported code (e.g., elapsed time, number of BERT errors, etc.). The register value is meaningful for any codes that generate **Minimum**, **Maximum**, **Average**, **Accumulator**, and/or **Real Time** codes. Even if a value is not meaningful, it still must be specified. Note in the script example that Code 1001 has been defined as a realtime error. Therefore, the error will use the value entered for #z in the realtime error display.

B.1.4 Modifying Scripts to Include Extended Reporting using ScriptMate®

In this exercise, an SS7 Originate script is modified to report a real time error when an SS7 ANSWER message is not received. Though you may have a different interface type, the process to include Extended Reporting is the same.

1. Open ScriptMate and select Signaling System 7 (1.5 Mb/s) from the target interface window.
2. Select the File pull down menu and select Open. Select SS7 Orig Std 9327021b from the Script Files directory within the ScriptMate directory. The default installation path is C:\Program Files\ScriptMate\Script Files. ScriptMate displays SS7 Originate Standard Call Flow Diagram.
3. Click on the connection between the Wait for Answer (ANM) icon and the Initialize SS7 Originate Line icon. Press the Del key to delete the connection.
4. Open the General Palette. To open the General Palette, select Open under the File pull down menu. Go to the Palettes directory (C:\Program Files\ScriptMate\Palettes) and select the Primitive directory. Open the General Palette. Make sure the "files of type" field is set for Palettes (*.plt).
5. From the General Palette, click and drag the Report 1 Extended Code icon on the Call flow diagram. (The icon names will appear when you hold the mouse pointer over each icon.) Double-click on the icon and select the Parameters Tab. Change the code name to R_NoANMRecvd and select Apply. Select OK to exit.

6. Select the No ANSWER Msg node on the Wait for Answer (ANM) icon. Next, click on the Report 1 Extended Code icon to make the connection. Select and highlight the output node (square) located on the right side of the Report 1 Extended Code icon. Click on the Initialize SS7 Originate Line icon to make the connection.
7. Select the View pull down menu and select Dictionary. Scroll down and locate the R_NoANMRecvd and enter a value of 1001. (The values used for the Extended Reports are in the range of 256 to 65535.) Change the type from variable to constant. Close the dictionary.
8. Select the Tools pull down menu and select Define Report Format. Type "No Answer Report" under the Report Title field at the top of the window. Under the value column, select the drop down arrow and select the R_NoANMRecvd value. Under the type column, there are seven selections:

ACCUMULATOR	Adds current register value to the previous total.
AVER100MS	Adds each new time to the total time and averages that time based upon the report count. This report type is typically used when reporting average time, because it multiplies the result by 10 to convert the data from tenths of seconds to seconds.
AVERAGE	Adds the new value to the total and generates a new average based on the report count.
COUNTER	Increments the existing value by one.
MAXIMUM	Compares the new value to the existing maximum value and displays the larger of the two values.
MINIMUM	Compares the new value to the existing minimum value and displays the smaller of the two values.
REALTIME	Each time the code is received, the call generator generates a Real Time message, using the title defined in the Title field.

   For this exercise, keep the code type COUNTER. Check the Realtime box to generate a Real Time message every time this report is generated. Change the title column from CODE 1001 to No ANSWER Message Received. Select Apply. Select OK to exit.
9. Select the File pull down menu. Select Save As, and enter the filename origSS7.

10. Select the File pull down menu. Select Create Script to convert the Call Flow Diagram (.CFD) file to a Source Code (.SRC) file.
11. The script is now ready to be downloaded.
12. To download the source code (.SRC) file, open FeatureCall, select the Call Setup pull down menu, and select Scripts. Locate and highlight the script under the Workstation Scripts, and select the download button. Enter a Script Name and a Script Number. The Script Name will be whatever you want to have displayed under the unit scripts field.

B.1.5 Modifying Scripts to Include Extended Reporting using a Text Editor

In this exercise, an SS7 Originate script is modified to report a real time error when an SS7 ANSWER message is not received. Though you may have a different interface type, the process to include Extended Reporting is the same.

1. From FeatureCall, select the Call Setup pull down menu, then select Scripts. Under the Unit Scripts, select ORIG SS7 for the unpaired originate script. Select edit/view to open a notepad window of the script.
2. Select the Search pull down menu, then select find. Type SIG_CONNACK in the field and select find next. Two lines below, after the SET #z 0, type

```
EXREPORT channel
    EXCODE R_NoANMRecvd
END
```

3. Next, the code name (R_NoANMRecvd) must be defined in the #VARIABLES section of the script. The variable section is the last section of the script. Once the code name is defined, a #REPORT section must be added before the #END.

```
#VARIABLES
.
.
.
R_NoANMRecvd & 1001
#REPORT
TITLE "No Answer Report"
CODE R_NoANMRecvd COUNTER REALTIME "No ANSWER Message Received"
#END
```

Note: There are seven report codes to choose from. In this example we are defining this code to be a counter as well as a realtime report.

ACCUMULATOR	Adds current register value to the previous total.
AVER100MS	Adds each new time to the total time and averages that time based upon the report count. This report type is typically used when reporting average time, because it multiplies the result by 10 to convert the data from tenths of seconds to seconds.
AVERAGE	Adds the new value to the total and generates a new average based on the report count.
COUNTER	Increments the existing value by one.
MAXIMUM	Compares the new value to the existing maximum value and displays the larger of the two values.
MINIMUM	Compares the new value to the existing minimum value and displays the smaller of the two values.
REALTIME	Each time the code is received, the call generator generates a Real Time message, using the title defined in parenthesis.

4. Select Save As from the File pull down menu and enter the filename "origSS7.SRC".
5. Select the File pull down menu, and select Create Script to convert the Call Flow Diagram (.CFD) file to a Source Code (.SRC) file.
6. The script is now ready to be downloaded.

7. To download the source code (.SRC) file, open FeatureCall, select the Call Setup pull down menu, and select Scripts. Locate and highlight the script under the Workstation Scripts, and select the download button. Enter a Script Name and a Script Number. The Script Name will be whatever you want to have displayed under the unit scripts field.

B.1.6 Once the Script is Downloaded

Once a script with Extended Reporting has been downloaded to a unit, a Report Page is created, using the script name. To access the report codes, simply select that Report Page from the main FeatureCall window and press the Statistics button to update the statistics.

You can also add the Standard Reports to your Report Page by selecting the Report pull down menu and selecting Report Format. Select the Report Page for your script and check the add standard codes box. This will allow you to add the standard codes to your Report Page.

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