HYDRA *APPLICATION SOFTWARE*

HYDRA STARTER PACKAGE

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FLUKE®

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Section 1
Getting Started

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SUMMARY OF GETTING STARTED 1-1.

Hydra Starter Package™ (Starter) is a menu-driven, software package that operates Hydra remotely from an IBM PC® (or compatible) over an RS-232 interface. It is used to transfer configuration data from and to Hydra, log measurement data collected by the Hydra, and manage the acquired data.

For details on how to operate Hydra, refer to the Hydra Users Manuals:

- Model 2620A "Data Acquisition Unit" (PN 885988)
- Model 2625A "Data Logger" (PN 885988)
- Model 2635A "Data Bucket" (PN 931894)

Some major features of the "Starter" software are as follows:

- Supports one Hydra on RS-232 (on COM1 or COM2).
- RS-232 communication parameters (baud, parity, etc.,) are selectable, allowing easy communication between the PC and Hydra.
- Hydra can be queried for measurement updates automatically at a user-defined interval. Recorded data are automatically written to a disk file.
- Upload and download configuration files.
- Upload of Model 2625A logging memory.
- Management of Model 2635A "Data Bucket" memory card files.

SYSTEM REQUIREMENTS 1-2.

The Starter software is designed to run on the IBM PC®, PC-XT®, PC-AT®, 386, and 486, or true compatibles on the MS/PC-DOS operating system.

All instrument setup (channel programming, instrument COM configuration, scan rate selection, etc.) must be done from the Hydra front panel. Starter does not support remote programming of the instrument configuration. However, Starter does support uploading and downloading of the instrument configuration and storage of this information to files on the PC.

Starter consists of the following:

1. An executable program file (STARTER.EXE).
2. A help text file (STARTER.HLP).
3. A default setup file (STARTER.INI).
4. A text file that can be read at the PC (using word processing or a text editor) for any details not found in this manual (README.TXT).

These files are distributed on both 5-1/4 inch (360K) and 3-1/2 inch (720K) diskettes to accommodate PCs with various diskette drives, and are “packed” into a single executable file, START.EXE. When executed, START.EXE unpacks the four files described above.

Starter will work with the following standard IBM (or compatible) display boards:

- Standard monochrome text display
- Hercules Graphics Adapter
- Color Graphics Adapter (CGA)
- Enhanced Graphics Adapter (EGA)
- Video Graphics Array (VGA)
- Super VGA (SVGA)

USING THIS MANUAL 1-3.

Section 1, "Getting Started," provides an overview of Starter plus installation procedures and an introduction to the operation of Starter.

Section 2, "Menus and Windows," provides an extended description of the Starter menus and windows, and hints for operation.

Section 3, "Typical Operations," provides common sequences for operating Starter.

Assumptions 1-4.

This manual assumes that Starter is configured as shipped from the factory. To ensure this, if a STARTER.INI file (the Starter initialization file) is in the current working directory, delete it, rename it, or copy it to another directory.

Conventions 1-5.

The following conventions are used in this manual to help distinguish command line keystrokes from surrounding text.

ccc	Hydra and Starter command names are represented as all lowercase characters. However, these commands can be entered as any combination of uppercase and lowercase characters. Example: freq2 means type the command "FREQ2" in any combination of uppercase and lowercase characters.
<ENTER>	Means press the carriage return or enter key on your PC.
<XXX>	Angle brackets enclosing all uppercase characters means press the "XXX" key.

Example: <ESC>

means press the "ESC" key.

LOADING AND RUNNING STARTER 1-6.

The following information explains how to load and run the Starter software, move around the menu structure, and establish a communication link with Hydra. At each level of the menu structure, a help message for the currently highlighted menu item or active data entry window is displayed when you press the F1 key. The help text selected is dependent on the current selection in the menu. When you are done with the help screen, press any key on the keyboard (<SPACE> is convenient) to return to the menu.

What You Should Know 1-7.

Starter is easier to master if you are already familiar with the general operation of Hydra and the IBM Personal Computer.

You should be able to do the following:

- Locate and interconnect the serial ports (RS-232 interface connector) on the PC and Hydra.
- Plug in and turn on the PC.
- Specify a path and file name (e.g., `C:\HYDRA\STARTER.EXE`).
- Specify a pattern for matching (e.g., `DIR A:\*.TST`).
- Change the active drive.

You should also be able to use these DOS commands effectively:

- `MD` (make directory, e.g., `MD C:\HYDRA`).
- `DIR` (show directory listing).
- `COPY` (copy a file, e.g., `COPY A:\*.* C:\HYDRA`).
- `CD` (change working directory, e.g., `CD C:\HYDRA`).

If you do not know how to perform the actions and use the DOS commands indicated above, refer to the appropriate sections of your computer's operation or operating system (DOS) manual.

Setting Up 1-8.

First, make one backup copy of the Starter disk. Then store the original for safekeeping. Use the copy for day-to-day operations.

CAUTION

When Starter is being run, memory resident programs may cause a loss of serial data. Your AUTOEXEC.BAT file may be executing a program that stays active after returning to DOS (a terminate and stay resident program). It may be necessary to edit the AUTOEXEC.BAT file and reboot.

Connect the IBM PC serial port to Hydra using an appropriate cable (see the Users Manual for more information).

- Use the Fluke RS40 terminal interface cable (DB-9 to DB-25 female connector) to connect Hydra to a PC, PC/XT, or PS/2.
- Use the Fluke RS41 modem cable (DB-9 to DB-25 male pins) if Hydra is connected to a modem.
- Use both the Fluke RS40 and RS41 cables to connect Hydra to a PC/AT.

Installing Starter 1-9.

Perform the following procedure to install Starter on a hard disk:

1. Change the default drive to the hard disk.
2. Make a directory on the hard disk by entering the DOS command line:

   ```
   MD HYDRA <ENTER>
   ```

3. Change to this directory using:

   ```
   CD HYDRA <ENTER>
   ```

4. Insert the Starter disk into a drive and copy all files to the new hard disk directory. Assuming the floppy drive is drive A:, the hard drive is C:, and you have moved to the new Hydra directory, the copy command would be:

   ```
   COPY A: *.* <ENTER>
   ```

5. Unpack the application by typing:

   ```
   START <ENTER>
   ```

6. Start the application by typing:

   ```
   STARTER <ENTER>
   ```

   If you want to execute the program from directories other than the one where the files are stored, you should add the subdirectory you created above to the path statement in your AUTOEXEC.BAT file.

   Command line arguments are supported to allow start up from a batch file (such as AUTOEXEC.BAT) or to customize the operation of the program. These are as follows:

/G	Startup data collection without Setup Menu.
/F<name>	Use <name> as the default configuration file.
/T<number>	Delay <number> of seconds before starting.
/M	Use monochrome mode.
/L	Inhibit display of the logo screen at startup.
/D	Dial the modem at data collection startup.
/U	Start up memory upload without Setup Menu.
/UC	Start up memory upload without Setup Menu, then clear memory.

When /G is included on the command line, data collection is entered without any user interaction (the logo and Main Menu screens are not displayed).

When /F is included, the file specified in the /F argument is used as the Starter configuration default file.

The /T argument is used to delay data collection startup until equipment used in the test setup is warmed up and ready.

The /M switch forces the use of monochrome display format on a color display adapter. This makes the menu easier to read on black and white monitors used with a color-capable display adapter.

The /L switch is used to inhibit the display of the startup logo screen.

The /D switch is used in conjunction with the /G switch to force the program to dial a preselected phone number on an attached modem.

The /U and /UC switches (Model 2625A Data Logger only) are used to upload the contents of a Hydra Logging Memory without user interaction. Either the default setup file or the setup file specified in the /F argument is used. If /UC is used, the logging memory is cleared after the upload is completed. (When using /U with Hydra Main Firmware version 5.4 or before, the logging memory is always cleared after an upload.)

As an example, you could start data collection (without the Setup Menu) using STARTUP.INI as the default configuration file after a 100-second wait with the following command:

```
STARTER /G /FSTARTUP.INI /T100
```

7. At the opening message, press any key to proceed to the Main Menu.

Menus and Entry Windows 1-10.

The following paragraphs describe how to move around the menus and entry fields in Starter. The menus are arranged in the order that you will probably use to set up the program. When you first go to the Main Menu, the Setup Menu is displayed. The Setup Menu selections are shown in Figure 1-1.

At the top of the screen is the Main Menu bar. At the bottom of the screen are two lines of text. The first line is a short description of the item currently highlighted; the last line displays the commands that you could perform at this point.

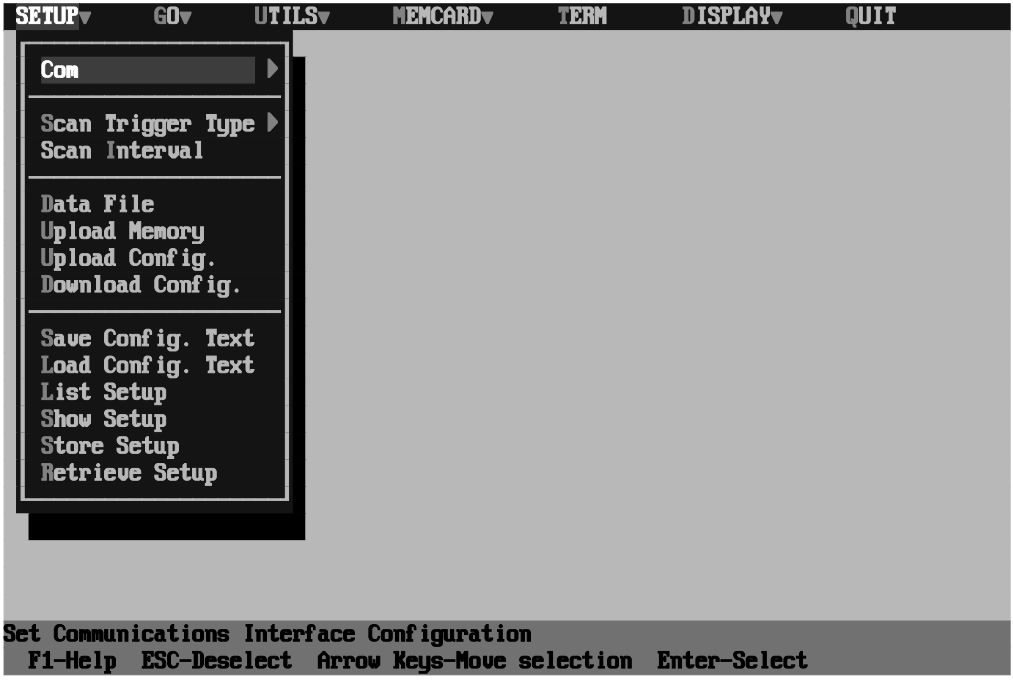

Figure 1-1. Setup Screen

Selecting From a Menu 1-11.

To select an item within a menu or submenu, do one of the following:

- Use the up/down arrow keys to move the cursor to the desired selection, then press <ENTER>.
- Press the key that corresponds to the highlighted letter in the selection, then press <ENTER>.

To exit from a menu, press <ESC>.

There are three types of menu items in Starter:

- Items with a small arrow displayed next to them. These will display a lower level menu when that item is selected.
- Items that toggle functions will display a check mark. This indicates the choice you have made.
- Items that open a data entry window when they are selected. These windows are described in more detail below.

Once data collection is started, the menu screen is replaced with the data collection screen. You must exit from data collection to go back to the menus. Data collection is inactive during menu operations, and menu operations cannot be performed during data collection.

Data Entry Windows 1-12.

Data entry windows allow you to enter values (such as a scan interval). To move among entry fields, use the up and down arrow keys or the <TAB> and <SHIFT> <TAB> keys.

An entry field is a field in a submenu in which you can enter or edit information (i.e., file names) or numerical values. Entry fields are easily identified because they are highlighted and prompt you to enter a number, file name, or some other string of characters.

To change an entry, either type an entire new entry, or use the left and right arrow keys to move the cursor to the position of the characters to be changed, and overtype. The <INS> key may be used to toggle character insert mode. If you make a mistake, re-enter the value, or press the <ESC> key to cancel all the entries made during this time.

When you have finished making all entries in a data entry window, type <ENTER> to save the new information, or <ESC> to escape back to the previous menu (<ESC> cancels all new entries).

Problems Opening Starter 1-13.

If Starter does not operate, make sure that you have done the following:

- Loaded DOS Version 3.3 or later.
- Placed the STARTER.EXE file in either your current working directory or in the PC's path list.
- Used the correct command to start up Starter (STARTER <ENTER>).

Until Starter is running, error messages originate from the operating system.

Using On-Line Help 1-14.

On-line help is available for most of the menu items and data entry windows. Press <F1> to display an appropriate Help screen for the menu item or window. Press <SPACE>, or any key, to remove the help message and return to the previous screen.

Linking the PC and Hydra 1-15.

Starter supports one Hydra at a time. Be sure that the RS-232 (COM1 or COM2) port on the PC is cabled to the RS-232 connector on the Hydra rear panel, then proceed as follows:

1. Turn Hydra ON.
2. Select "Com" from the Setup Menu by highlighting Com, then pressing <ENTER>.
3. Select "COM1" or "COM2" with the up or down arrow key, then press <ENTER>.
4. When you enter your choice, the next menu appears. Select the desired baud rate and parity or Autobaud, where Starter will automatically select the baud rate and parity to match the Hydra settings. If you select a specific baud rate and parity, these must match those selected on Hydra.

Using a Modem to Link the PC and Hydra 1-16.

If you are using a modem pair to connect the PC and Hydra, you will need to set up the modem parameters using the "Setup Modem" menu, immediately after selecting the COM port parameters. You can select the phone number to dial, the dialing mode, originate mode, and dialing times. Before using the connection, you must select the "Dial" menu entry to establish communication.

Section 2
Menus and Windows

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SUMMARY OF MENUS AND WINDOWS 2-1.

Section 2 is a reference guide to Starter menus and windows. Each menu describes the keys used to makes menu selections. Press the F1-Help key at any time to obtain On-line Help for specific information about an operation. Starter menus and windows are summarized in Table 2-1.

Section 3, "Typical Operations," provides examples of typical operations that use the menus and windows discussed in this section.

Table 2-1. Summary of Starter Menus and Windows

FUNCTION	DESCRIPTION	FIGURE
Com Menu	Select Communications Port Parameters	2-2
Setup Modem Menu	Select Modem Parameters	2-3
Scan Trigger Type Menu	Select Scan Triggering Configuration	2-4
Scan Interval Menu	Scanning Interval (seconds)	2-5
Data File Menu	Configure a DOS File for Measurement Data	2-6
Upload Memory Menu	Get Scans Stored in Hydra Memory	2-7
Upload Config. Menu	Hydra Config. Upload into PC RAM	2-8
Download Config. Menu	Hydra Config. Download from PC RAM	2-9
Save Config. Text Menu	Store Hydra and Program Configuration into a text file	2-10
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GO Menu	Enable Hydra Scanning	2-16
Measurement Display	Display Measurements During Scan	2-17

Table 2-1. Summary of Menus and Windows (cont)

FUNCTION	DESCRIPTION	FIGURE
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DOS Utilities Menu	DOS Functions Available While in Starter	2-21
MEMCARD Menu	Select Memory Card Operations	2-22
Card Location Menu	Selects Location of Memory Card Drive	2-23
Directory Menu	Queries the Memory Card for File Directory	2-24
Copy File Menu	Memory Card Drive and PC File Transfers	2-25
Convert File Menu	Copies and Converts Memory Card Files	2-26
Delete Memory Card Files	Deletes Selected Files from Memory Card	2-27
Format (In Hydra Only) Menu	Formats the Hydra Memory Card	2-28
Status (In Hydra Only) Menu	Returns Status of the Hydra Memory Card	2-29
Write Configuration File Menu	Configure Hydra with Starter Setup	2-30
Read Configuration File Menu	Configure Starter with Hydra Setup	2-31
TERM (Terminal) Menu	PC/Hydra Terminal Emulator	2-32
DISPLAY Menu	Computer Background and Decimal Point	2-33
QUIT Menu	Quit Starter and Save Default Changes	2-34

SETUP MENU 2-2.

The “SETUP” menu (Figure 2-1) makes selections for configuring the PC COM port, scan triggering, scan interval, and various data/file transfer functions. Each function in the setup menu is described in the following paragraphs.

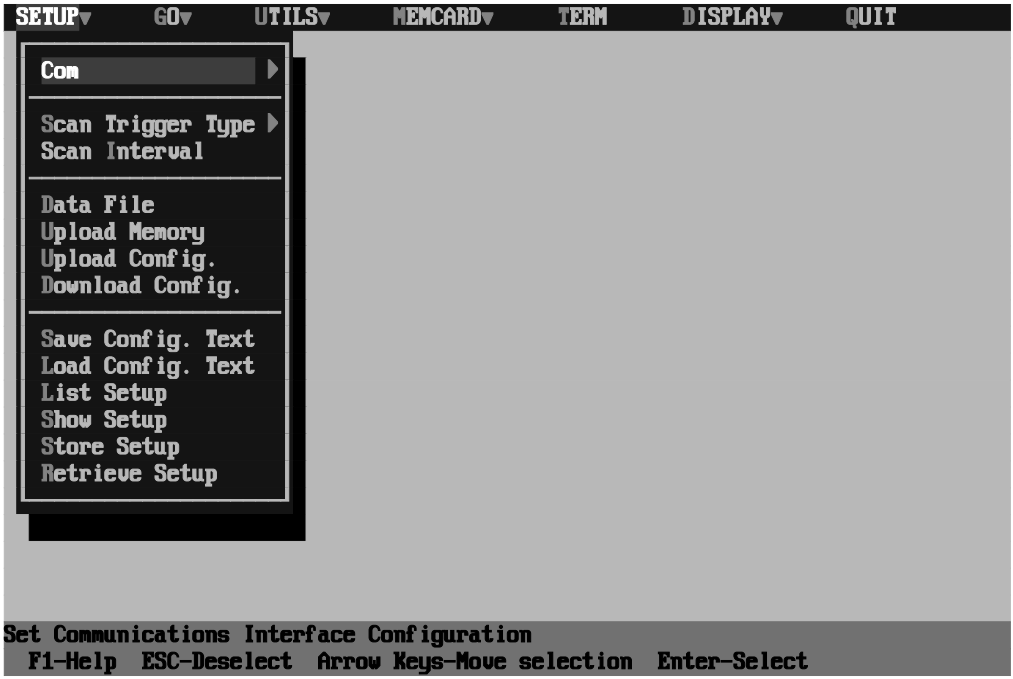


Figure 2-1. SETUP Menu

Com Menu 2-3.

The “Com” menu (Figure 2-2) chooses the PC COM port for RS-232 communications (COM1 or COM2), or disables RS-232 communications by selecting Disable Com. If a modem is used, be sure the software supporting the modem agrees with the port selection. The RS-232 parameters selected must correspond to Hydra RS-232 parameters. For a direct RS-232 connection with Hydra (no modems), you may select AutoBaud to automatically track Hydra baud rate and parity. When a modem connection is used, it may be necessary to select the actual baud rate that matches Hydra selection.

If the 38400 baud rate is selected from the menu, make sure CTS is "On" for proper data transfer (Model 2635A Data Bucket only).

The example in Figure 2-2 has selected the RS-232 COM1 port and communication parameters 1200 baud and No Parity.

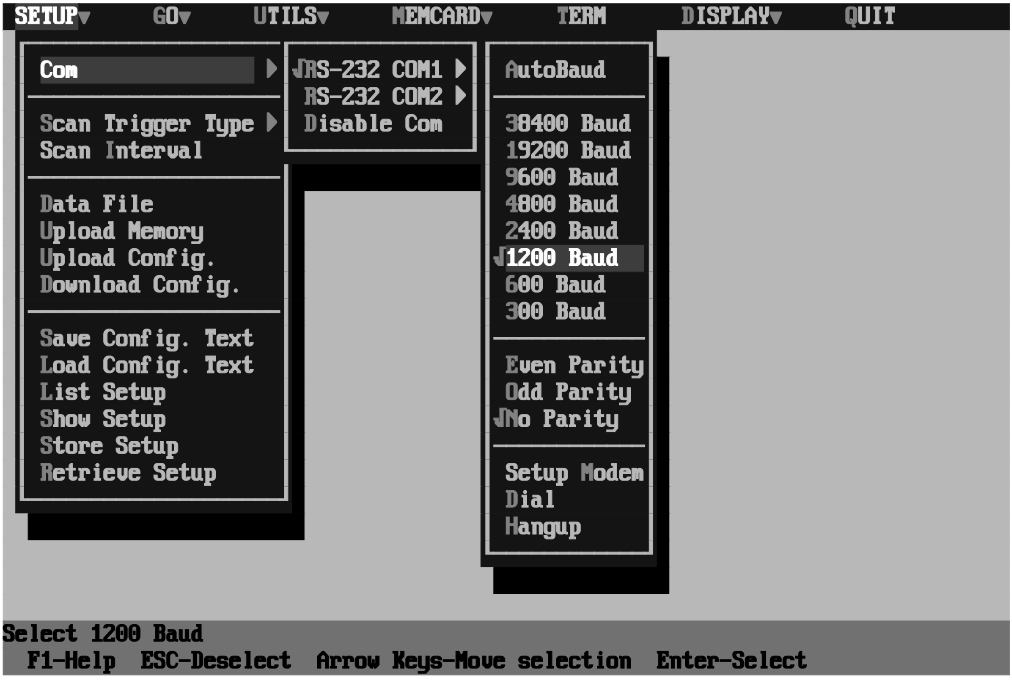


Figure 2-2. Com Menu

Setup Modem Menu 2-4.

The “Setup Modem” menu (Figure 2-3) configures modem parameters allowing Starter to originate or answer telephone calls. Most configurations have the PC call Hydra, therefore, Originate is usually selected.

The example in Figure 2-3 has enabled modem communications, entered the remote (Hydra) telephone number starting with 9, then a 4-second pause (each “,” character enters a 2-second pause) followed by the remaining numbers using “-” as a separator. Touchtone dialing and call origination are also selected. When Starter makes a telephone call using touchtone dialing, the duration and spacing of the dialing tones can be selected. The default is 70 ms. Answer Timeout sets the interval in which Hydra modem must answer, or the PC modem will hang up. The default is 30 seconds.

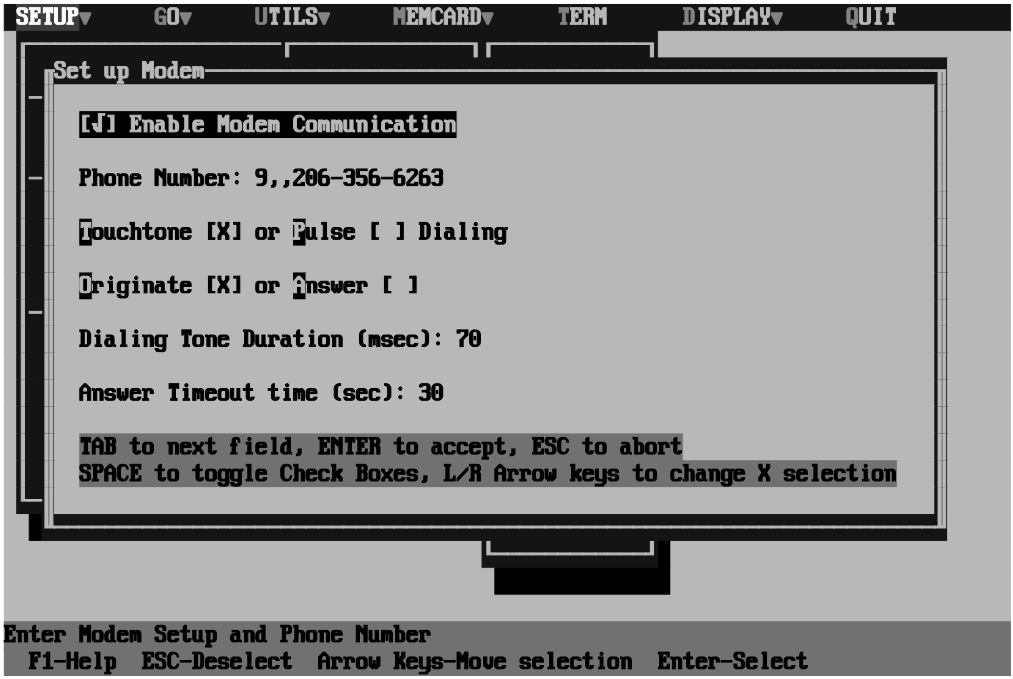


Figure 2-3. Setup Modem Menu

Scan Trigger Type Menu 2-5.

The “Scan Trigger Type” menu (Figure 2-4) sets the method used to trigger instrument scanning. Interval Scan Trigger is the normal triggering method. This normal triggering can be disabled or coupled with two triggering options: External Trigger and Monitor Alarm Trigger. External triggering is from an input at the rear of Hydra. Monitor Alarm Triggering can be set when Hydra is actively monitoring a channel in the Monitor Mode. If the monitored channel goes into alarm, scanning is triggered. When using the “GO” menu to start scanning, be sure to select “Start Scanning with Configuration Download” or the selection made in this menu will be ignored (Figure 2-16).

The example in Figure 2-4 has enabled normal scan triggering plus the Monitor Alarm Trigger. If the scan interval is set for 60 minutes, then a measurement scan starts every 60 minutes, unless a Monitor Alarm Trigger occurs, which will enable continuous scanning for as long as the alarm condition exists.

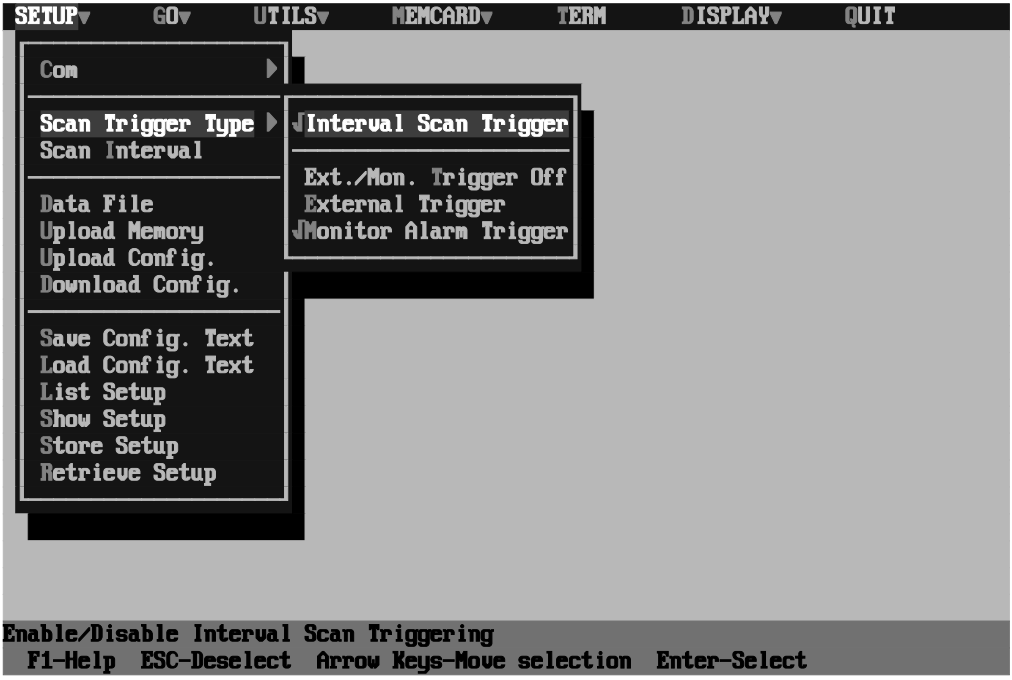


Figure 2-4. Scan Trigger Type Menu

Scan Interval Menu 2-6.

The “Scan Interval” menu (Figure 2-5) sets up the time in seconds between the starts of scans when normal interval scan trigger is enabled (Figure 2-4). A setting of 0 indicates continuous scanning. When using the “GO” menu to start scanning (Figure 2-16), “Start Scanning with Configuration Download” will set Hydra to the interval entered in this menu, while “Start Scanning with Configuration Upload” will change this menu to the interval entered in Hydra.

The example in Figure 2-5 has selected a scanning interval of 9015 seconds (2 hours, 30 minutes, and 15 seconds).

Figure 2-5. Scan Interval Menu

Data File Menu 2-7.

The "Data File" menu (Figure 2-6) enables and defines the DOS file used to record measurement data. When scanning starts and measurement data is sent to the PC, the data is recorded in this file. The Data File format is also used for other functions, e.g., "Upload Memory" menu. The data file is maintained in either binary or ASCII format. The binary format is more compact than the ASCII format, but the ASCII format is needed for compatibility with data analysis and management tools. Data stored in binary format can be converted to ASCII format using the "Translate Data File" menu (Figure 2-20).

The example in Figure 2-6 has enabled data recording to the file LOGDATA2.DAT, used the name Temperature Test, selected ASCII file formatting and Over-Write an existing file named LOGDATA2.DAT (if any). The Time/Date String appended to each measurement scan was also selected.

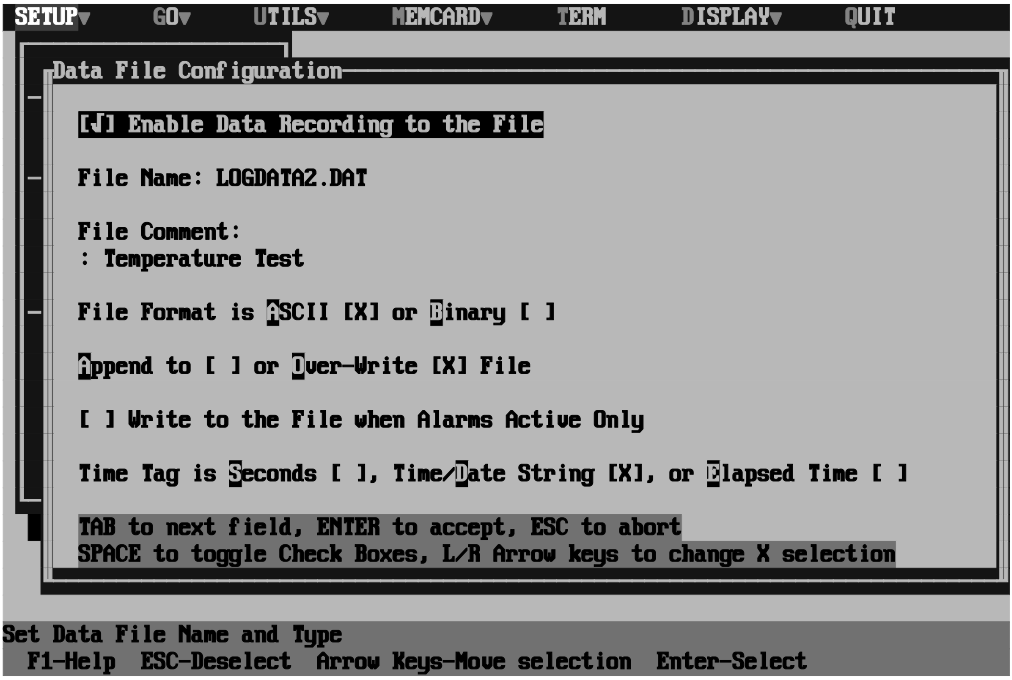


Figure 2-6. Data File Menu

Upload Memory Menu 2-8.

The “Upload Memory” menu (Figure 2-7) is used to extract scan measurement data held in Model 2625A Hydra logging memory. Up to 2,000 scans may be held in logging memory. Sending scan data to the logging memory is a selectable feature at Hydra using MODE (front panel SHIFT-PRINT keys).

The example in Figure 2-7 shows the normal sequence of steps for extracting readings, where a total of 47 scans are recorded, but only the scans 7 through 21 are being extracted. At the end of the procedure, a choice is given to clear the logging memory. If Y (Yes) is selected, the logging memory is erased. If you attempt this procedure when the logging memory is empty, the message “Empty logging memory” will appear and the procedure will terminate. See the Hydra Users Manual for methods of clearing memory using front panel controls.

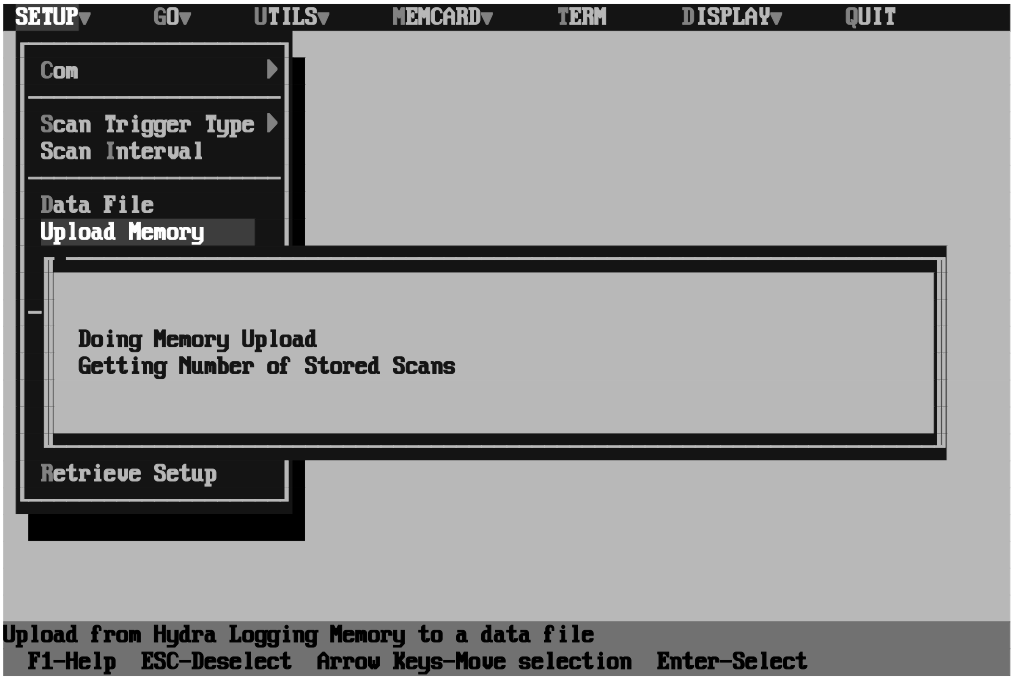


Figure 2-7. Upload Memory Menu

Opens Data File (see Figure 2-6)

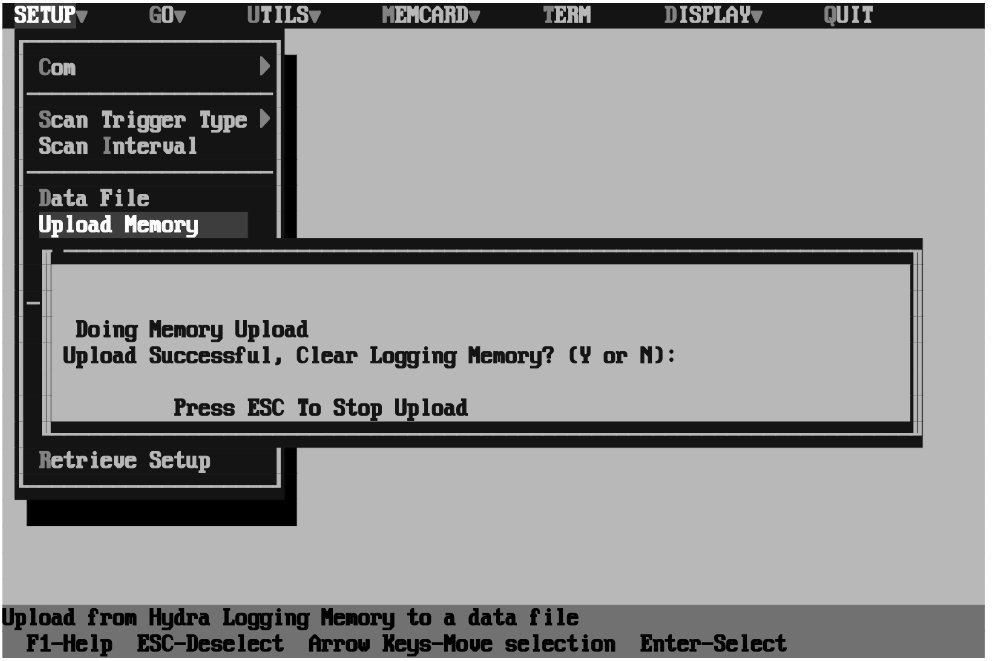


Figure 2-7. Upload Memory Menu (cont)

Upload Config. Menu. 2-9.

The “Upload Config.” menu (Figure 2-8) loads the complete Hydra configuration from Hydra into PC RAM. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. To view the configuration after completing this menu, refer to the “Show Setup” menu (Figure 2-13). The configuration can be saved in a PC DOS file by using the "Save Config. Text" (Figure 2-10) or "Store Setup" (Figure 2-14) menus.

The example in Figure 2-8 shows the message window displayed during the upload process. If the RS-232 link between Hydra and PC isn’t working or Hydra is not powered, the window changes to: “Configuration Upload Failed.”

MENU RELATIONSHIPS

Saving a Hydra configuration to a PC DOS setup file is a two-step process. The Hydra configuration is captured in PC RAM using the “Upload Config.” menu and saved using the “Save Config. Text” (Figure 2-10) or “Store Setup” (Figure 2-14) menus. Similarly, loading a Hydra configuration from a PC DOS setup file is a two-step process. The configuration data is loaded into PC RAM using the “Retrieve Setup” (Figure 2-15) or “Load Config. Text” (Figure 2-11) menus and then transferred to Hydra using the “Download Config.” (Figure 2-9) menu.

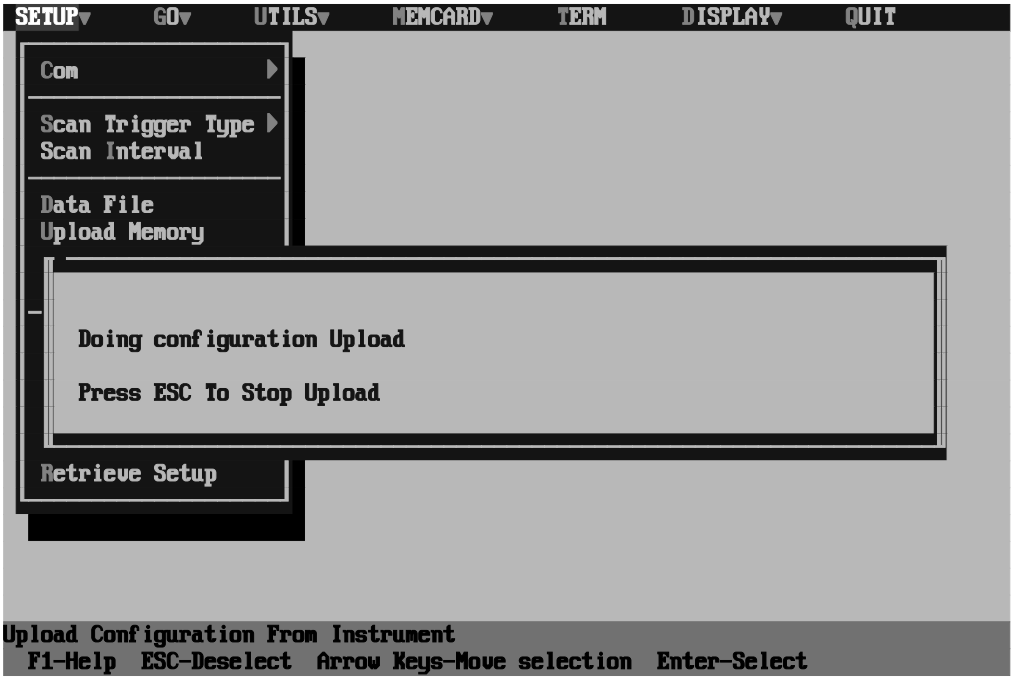


Figure 2-8. Upload Config. Menu

Download Config. Menu 2-10.

The "Download Config." menu (Figure 2-9) loads a Hydra configuration from PC RAM to Hydra. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. The configuration data in PC RAM originates from a previous "Upload Config." menu (Figure 2-8), a "Load Config. Text" menu (Figure 2-11), a "Retrieve Setup" menu (Figure 2-15), or from a default configuration in a Starter initialization file. To view this configuration prior to completing this menu, see "Show Setup" (Figure 2-13). See "MENU RELATIONSHIPS" (page 2-13) for more information.

The example in Figure 2-9 shows the message window displayed during the upload process. If the RS-232 link between Hydra and PC isn't working, or Hydra is not powered, the window changes to: "Configuration Download Failed."

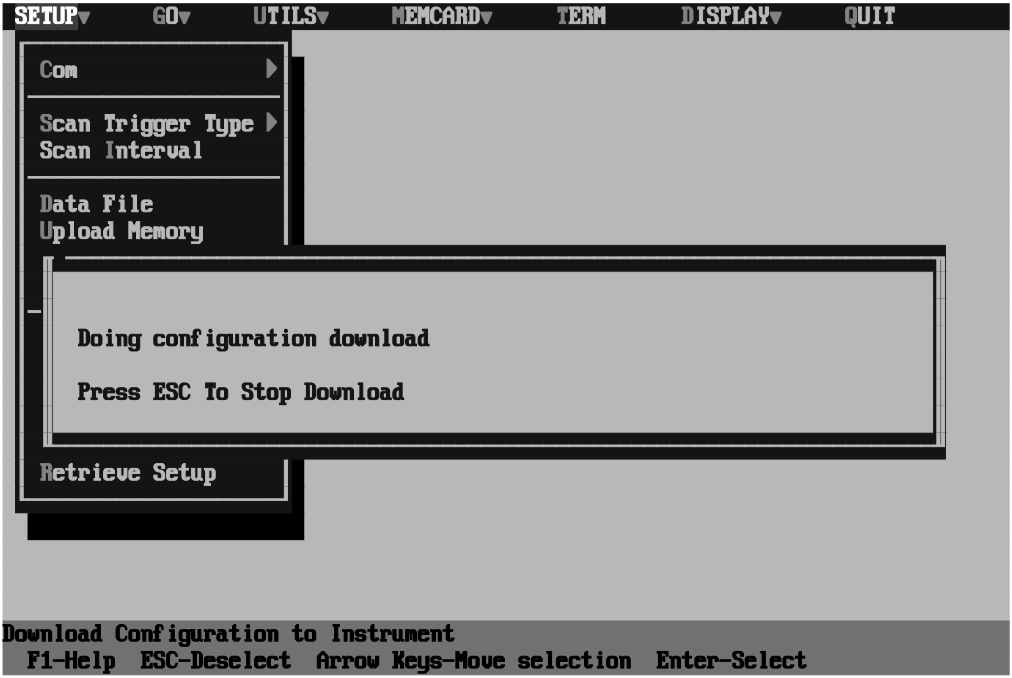


Figure 2-9. Download Config. Menu

Save Config. Text Menu 2-11.

The “Save Config. Text.” menu (Figure 2-10) transfers a complete Hydra configuration from PC RAM into a PC DOS text file. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. Since the source of this data is the configuration stored in PC RAM and not Hydra, use the “Upload Config.” menu first (Figure 2-8) if saving the present Hydra configuration. To view this configuration at the PC before (or after) completing this menu, see the “Show Setup” menu (Figure 2-13). See “MENU RELATIONSHIPS” (page 2-13) for more information.

The example in Figure 2-10 shows the message window displayed during the process and the file name CONFIG12.CFG. The file extension defaults to *.CFG. If an existing file name is selected, it is overwritten without warning.

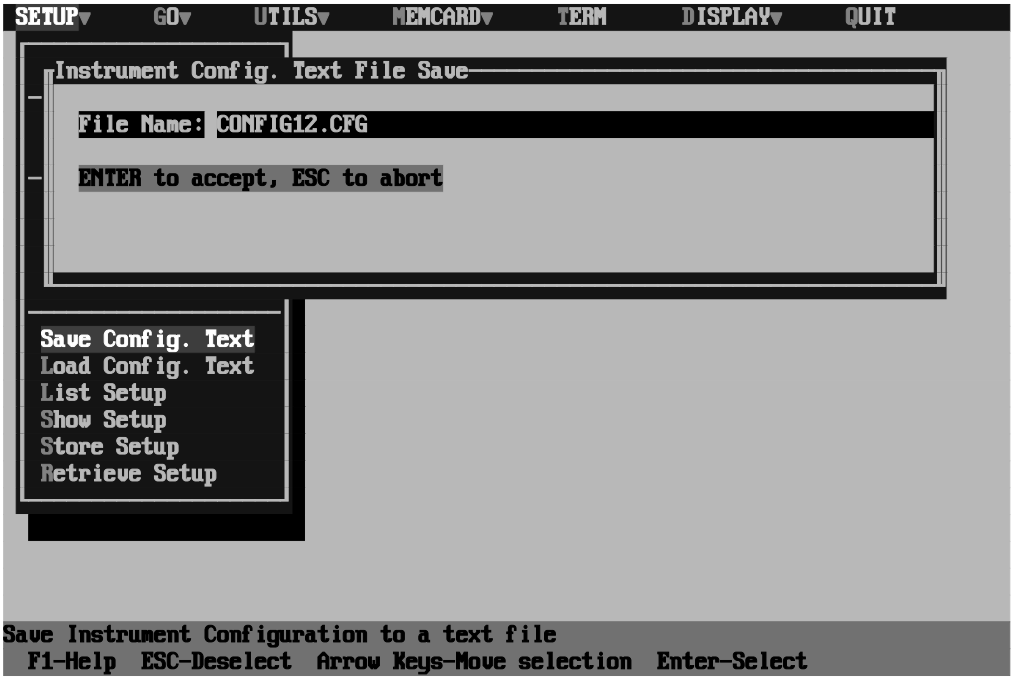


Figure 2-10. Save Config. Text Menu

Load Config. Text Menu 2-12.

The “Load Config. Text.” menu (Figure 2-11) loads a complete Hydra configuration from a PC DOS text file into PC RAM. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. To view the configuration, see the “Show Setup” menu (Figure 2-13). Download this configuration to Hydra using the “Download Config.” menu (Figure 2-9). See “MENU RELATIONSHIPS” (page 2-13) for more information.

The example in Figure 2-11 shows the message window containing the configuration files and the selection of the configuration file CONFIG12.CFG. Select the desired file, previously saved with the “Save Config. Text” menu (Figure 2-10).

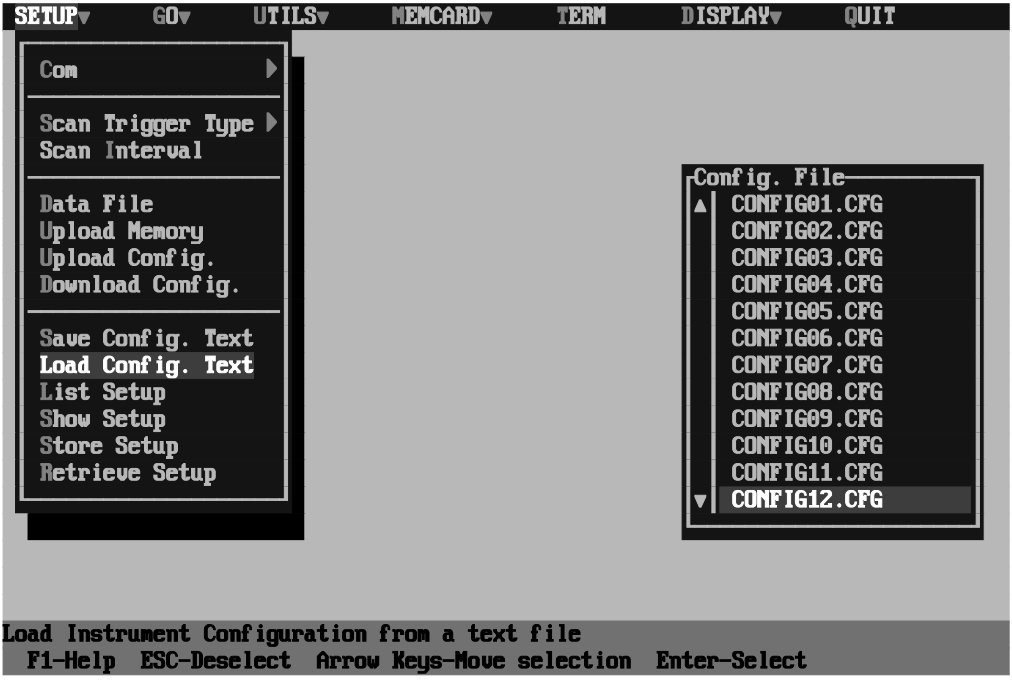


Figure 2-11. Load Config. Text Menu

List Setup Menu 2-13.

The “List Setup” menu (Figure 2-12) saves Starter's configuration and Hydra's configuration (as stored in PC RAM) as a PC DOS file. “List Setup” files are created for external word processing and printing, allowing a hardcopy output of Starter/Hydra configurations.

The example in Figure 2-12 shows that Starter/Hydra configuration data will be saved in the text file CONFIG10.LST. The List Setup menu can be viewed using the “Show Setup” menu (Figure 2-13). To print out a copy of a listing file, use a print utility to call up the file in any text editing/word processing application.

Figure 2-12. List Setup Menu

Show Setup Menu 2-14.

The “Show Setup” menu (Figure 2-13) is a visual presentation of the complete Starter and Hydra configuration, assuming PC RAM has the present Hydra configuration; otherwise, refer to the “Upload Conf.” menu (Figure 2-8). The menu has several screens of information, including the configuration of all channels.

The example in Figure 2-13 shows the “Program Configuration” and “Instrument Configuration” screens, and a portion of channel configurations. All channel parameters are listed, such as Alarms and Mx+B Scaling.

The Program Configuration parameters are all set using the “Data File” menu selections (Figure 2-6).

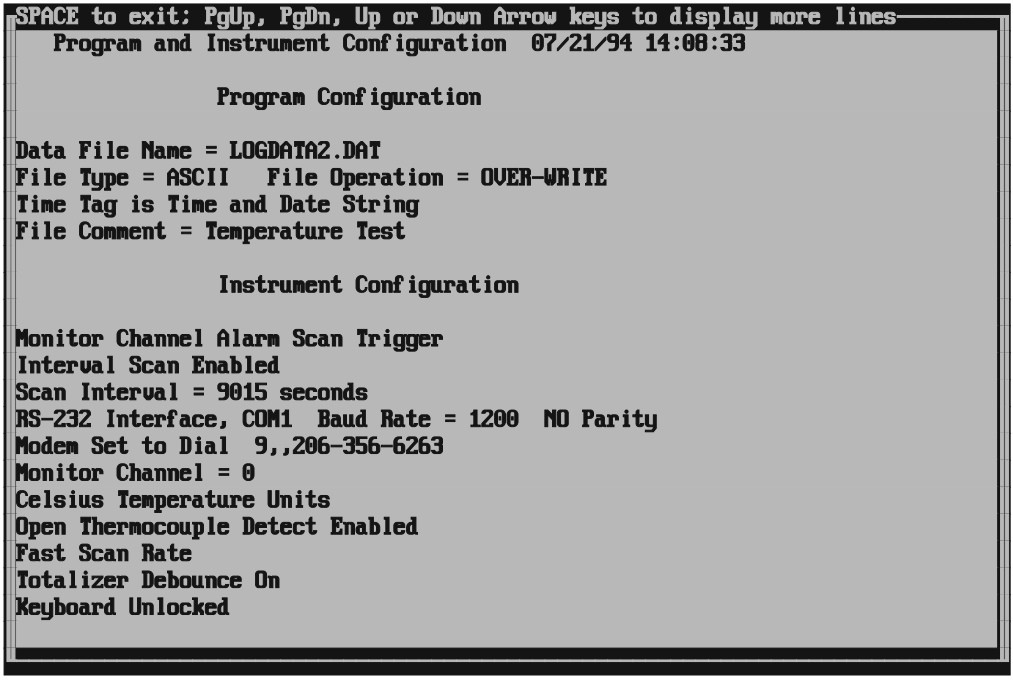


Figure 2-13. Show Setup Menu

The Instrument Configuration parameters are set as follows:

Trigger, Interval Scan, Scan Interval, and RS-232 Interface are set using Hydra or Starter. For Hydra, see the Users Manual. For Starter, refer to Table 2-1.

Monitor Channel is set at Hydra (using MON), as is Temperature Units (using Temperature-Toggle Power-On) and Scan Rate (using RATE).

Scan Data to Memory and Wrap at End of Memory are selected by Hydra front panel controls (2625A Data Logger only).

Open Thermocouple Detect, Totalizer Debounce, and Keyboard Unlocked cannot be configured by Starter or Hydra's front panel. However, the corresponding Hydra command can be entered in Starter's TERM (Terminal) mode. (See the example in Figure 2-32.) Refer to the Users Manual for more information about the command set.

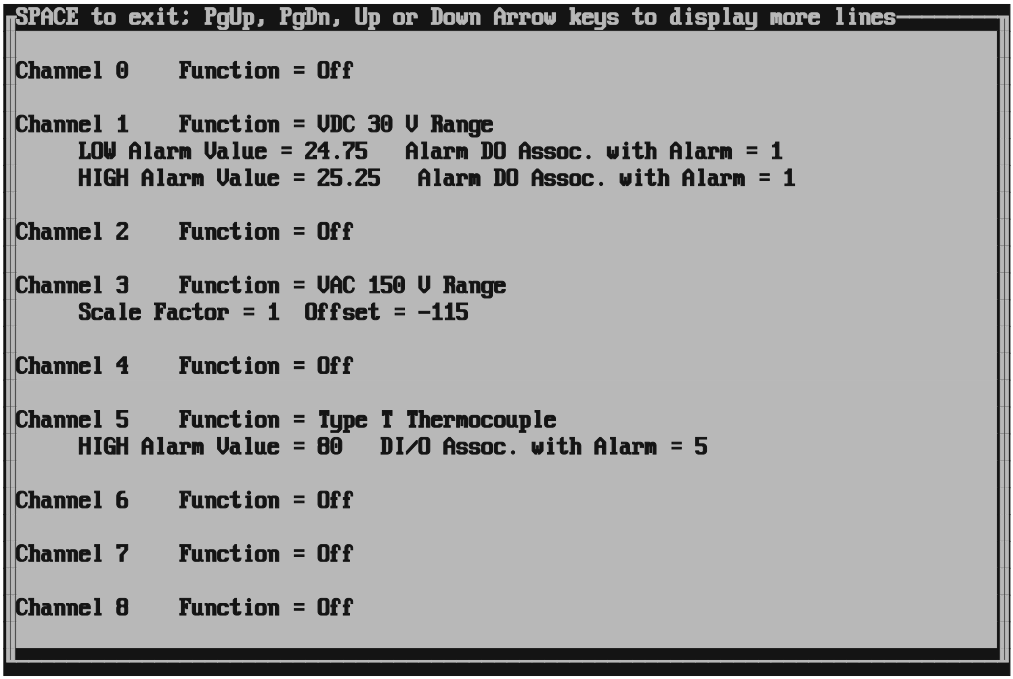


Figure 2-13. Show Setup Menu (cont)

Store Setup Menu 2-15.

The "Store Setup" menu (Figure 2-14) stores all Starter/Hydra default parameters in a PC DOS binary file. The file extension defaults to *.INI. When Starter is initialized, it automatically configures Starter using the file STARTER.INI (unless the /F switch is used; see Section 1). The initialization file can be changed using the "Retrieve Setup" menu (Figure 2-15). This same window appears when exiting Starter to either change the defaults or to store a new configuration. To view the default parameters after initializing Starter, use the "Show Setup" menu (Figure 2-13).

The example in Figure 2-14 shows the present Starter/Hydra (in PC RAM) configuration being saved in a PC DOS file called STARTER6.INI.

Figure 2-14. Store Setup Menu

Retrieve Setup Menu 2-16.

The “Retrieve Setup” menu (Figure 2-15) initializes Starter with a different file than the default STARTER.INI (or other file selected with the /F switch; see Section 1), or reasserts an initialization file. Initialization files are created with the “Store Setup” menu (Figure 2-14). When selected, the initialization changes the Starter setup and loads the Hydra configuration from the file into PC RAM. The new Starter/Hydra defaults can be viewed with the “Show Setup” menu.

The example in Figure 2-15 shows Starter being initialized using the defaults in the file STARTER7.INI.

Figure 2-15. Retrieve Setup Menu

GO MENU 2-17.

"Start Scanning with Configuration Upload" uses the present instrument configuration, which is uploaded from the instrument into PC RAM before scanning begins. Using this menu, therefore, ignores selections made with the "Scan Trigger Type" menu (Figure 2-4) and "Scan Interval" menu (Figure 2-5), and updates these menus to reflect the actual Hydra configuration.

"Start Scanning with Configuration Download" uses the configuration stored in PC RAM, which is downloaded from PC RAM into Hydra before scanning begins. The configuration in PC RAM can originate from settings in an initialization file using the "Retrieve Setup" menu (Figure 2-15), from a text file loaded with the "Load Config. Text" menu (Figure 2-11), or from an "Upload Config." menu (Figure 2-8). In addition, parameter selections made with the "Scan Trigger Type" menu (Figure 2-4) and "Scan Interval" menu (See Figure 2-5) are downloaded to Hydra.

"Simulated Data Collection" provides a pseudo display of measurement activity.

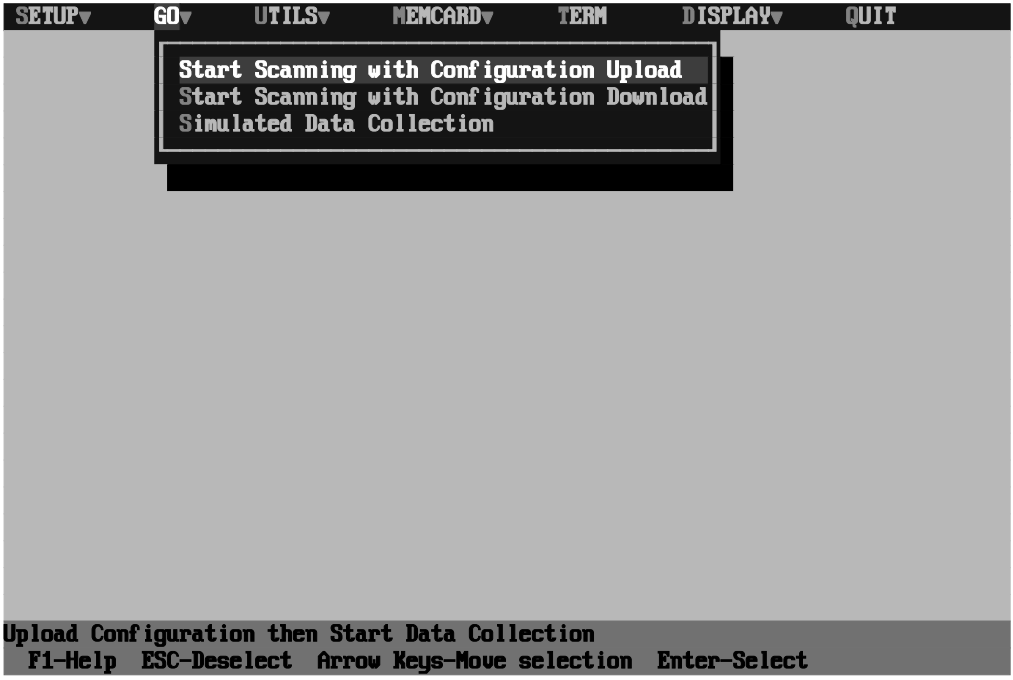


Figure 2-16. GO Menu

Measurement Display 2-18.

The measurement display portion of the "GO" menu (Figure 2-17) appears when scanning has started. For the Model 2635A "Data Bucket," the display can lag the actual measurement scan due to low baud rate selections for the RS-232 link or continuous scanning of many channels, which can backup the RS-232 link log queue. The totalizer count and status of the alarm outputs are also displayed.

Five switches may be operated: F1-Pause (message: "Data Collection Paused - Hit any key to continue"), F2-Freeze (message: "Screen Display Frozen - Hit any key to continue), F3-Single Scan (no effect if a measurement is taking place, otherwise, triggers an immediate single scan), F4-Stats [Statistics] (Figure 2-18), and F10-Quit.

The example in Figure 2-17 shows only one configured channel (Channel 0) and it is measuring frequency. If this channel had been in Alarm, ALM would appear after the reading and it would be highlighted. The totalizer count is shown at 0, and all alarms are H (high). When an alarm is set, L (low) will appear instead of H.

Figure 2-17. Measurement Display

Measurement Statistics Display 2-19.

The statistics (Stats) display (Figure 2-18) is enabled by pressing the F4-Stats key in the "GO" menu measurement display (Figure 2-17). The display parameters include the file name where the data is being recorded (as selected by the "Data File" menu in Figure 2-6), dates and times, and the number of completed scans. The F4 key changes to F4-Readings, which is pressed to return to the measurement display menu. The other F-keys have the indicated functions, as previously discussed (Figure 2-17).

The example in Figure 2-18 shows two scans have been recorded, and the data file is DATFILE8.DAT. The comment "Power Supply Test" was entered in the Data File menu. I/O error count refers to detected RS-232 parity or operational errors.

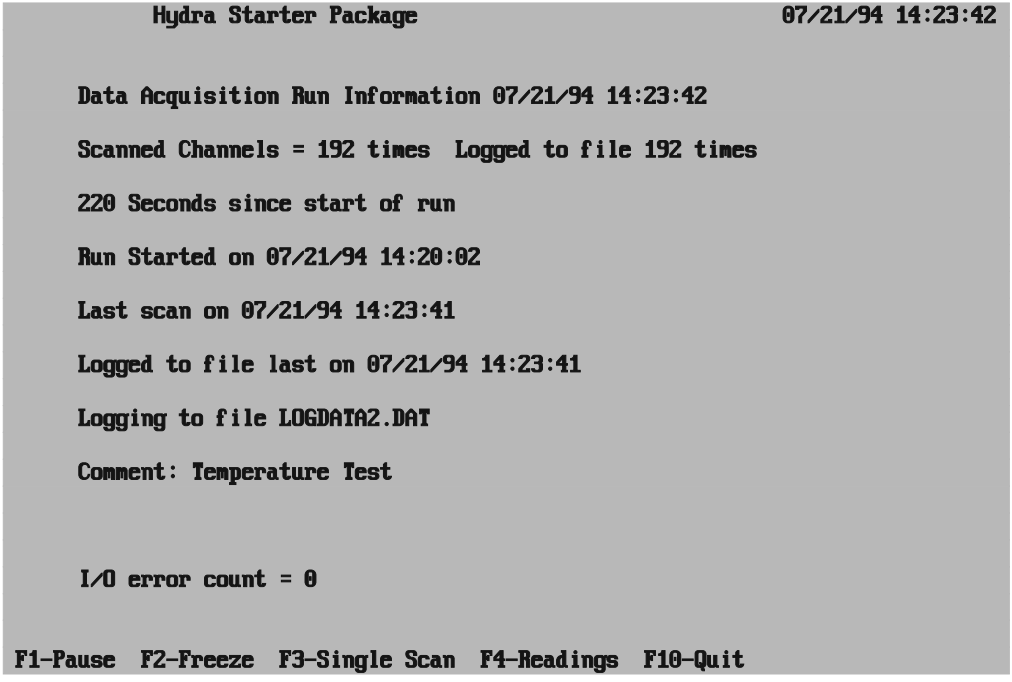


Figure 2-18. Measurement Statistics Display

UTILS MENU 2-20.

The “UTILS” (Utilities) menu (Figure 2-19) contains file translation commands and DOS commands to allow convenient file handling operations while in Starter.

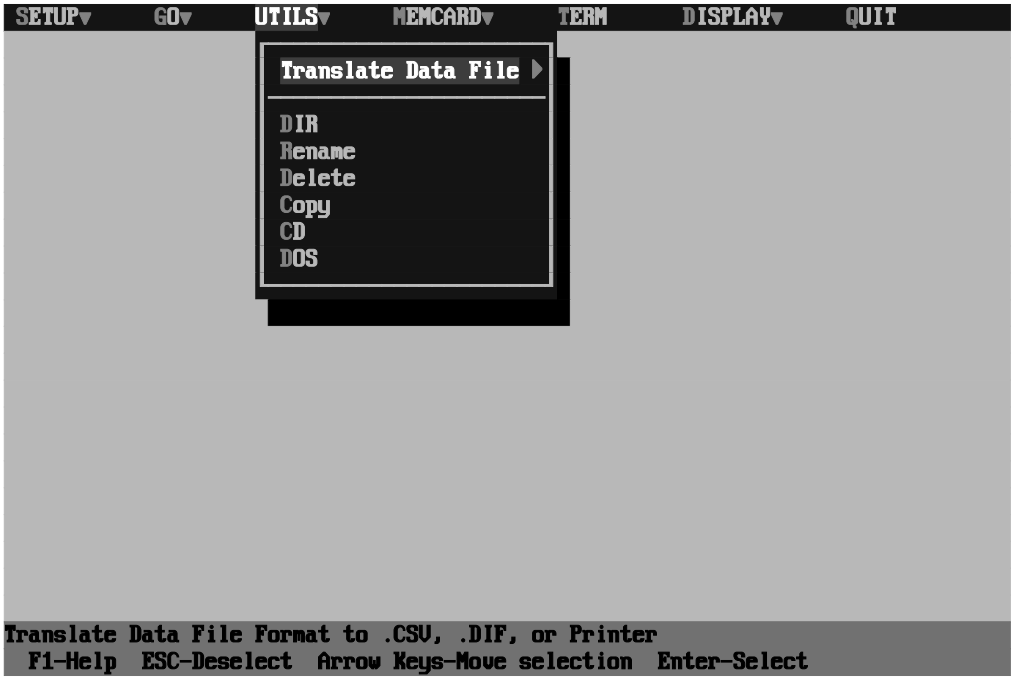


Figure 2-19. UTILS Menu

Translate Data File Menu 2-21.

The "Translate Data File" menu (Figure 2-20) allows raw data files to be translated into other formats. The three translation choices are *.CSV (Comma Separated Variable), *.DIF (Data Interchange Format), and Print. *.CSV and *.DIF files are used by spreadsheet and data analysis programs for data importation. The print translation converts the data file into an ASCII (text) format for printing, word processing, or text editing operations. File translations create a new file and do not alter the original.

Data files must be in the formats created by Starter (binary or ASCII), or in memory card binary format (Model 2635A Data Bucket only).

The example in Figure 2-20 shows the file DATFIL08.DAT will be translated into DATFIL08.CSV (default).

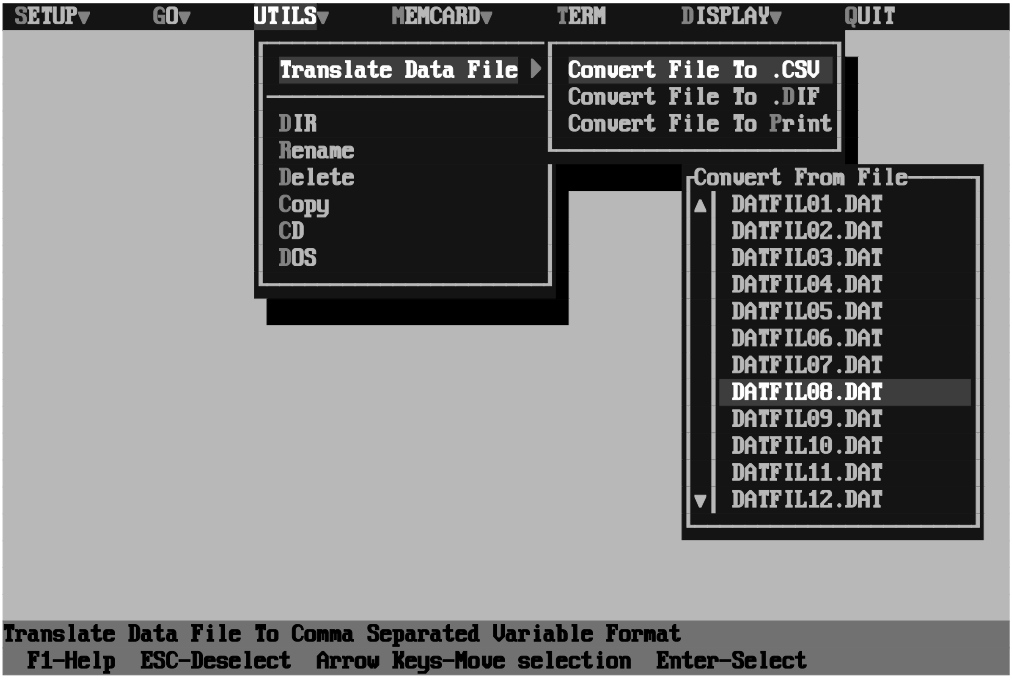


Figure 2-20. File Translation Menu

DOS Utilities Menu 2-22.

The DOS utilities menu (Figure 2-21) allows normal DOS operations while in Starter. Files can be renamed, deleted, copied, and operations such as DIR (Directory), CD (Change Directory) and other activities can be performed.

The example in Figure 2-21 shows that file DATFIL05.DAT will be copied. After Enter is pressed, a prompt appears for entering the name of the new file.

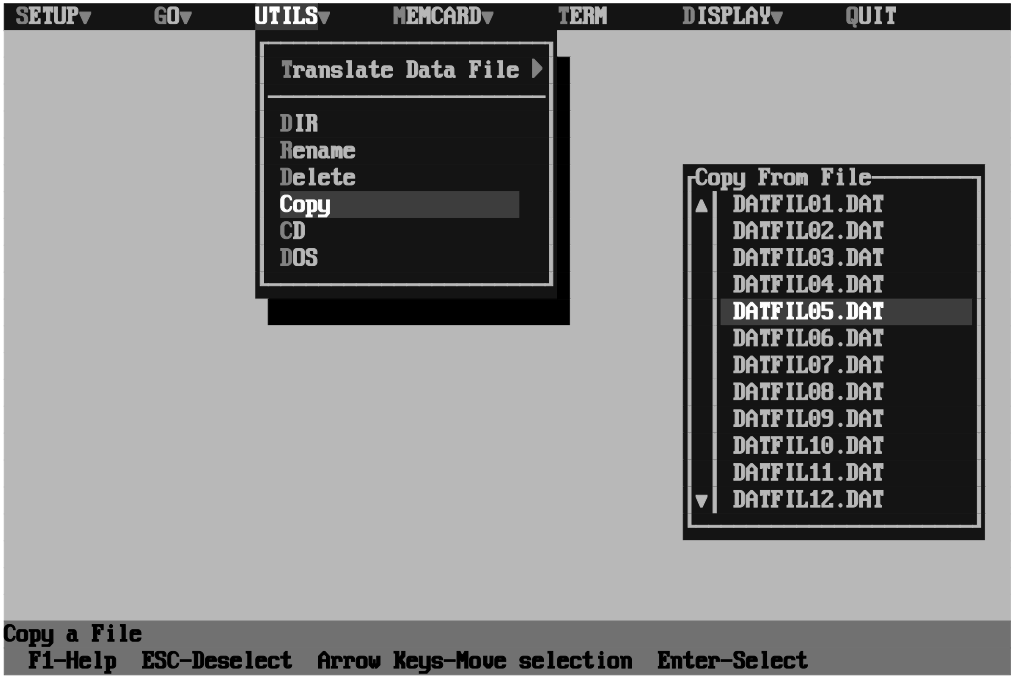


Figure 2-21. DOS Utilities Menu

MEMCARD MENU 2-23.

The "MEMCARD" menu (Figure 2-22) controls the interface between a memory card drive and Starter. The memory card drive can be mounted in Hydra (Model 2635A "Data Bucket") or a separate unit attached to the PC. Menu selections allow file transfers, memory card formatting, status reports, and related functions. The memory card drive appears to the PC as just another disk drive, except it has no moving parts.

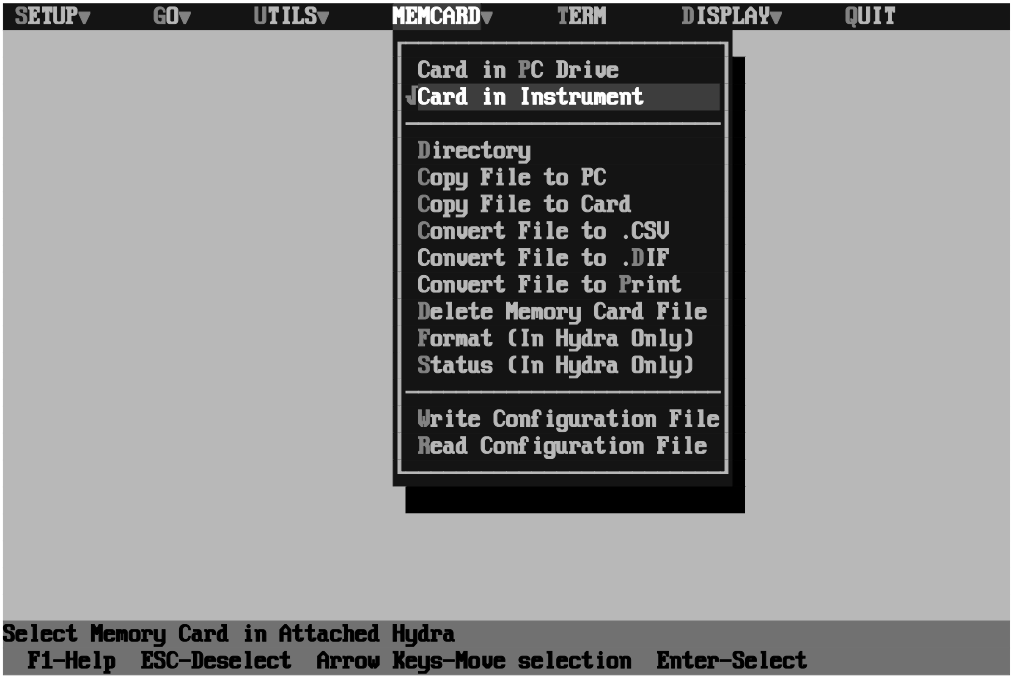


Figure 2-22. MEMCARD Menu

Card Location Menu 2-24.

The card location menu selects the location of the memory card drive for "MEMCARD" menu operations. For a memory card drive in the instrument, select "Card in Instrument" from the menu. For a memory drive installed at the PC, select "Card in PC drive" (see Figure 2-22). If "Card in PC drive" is selected, a window opens (Figure 2-23) that requests the letter representing the memory card drive attached to the PC. Enter the drive letter that was determined when the memory card drive was installed.

The example in Figure 2-23 shows the memory card drive in the PC is called the D drive.

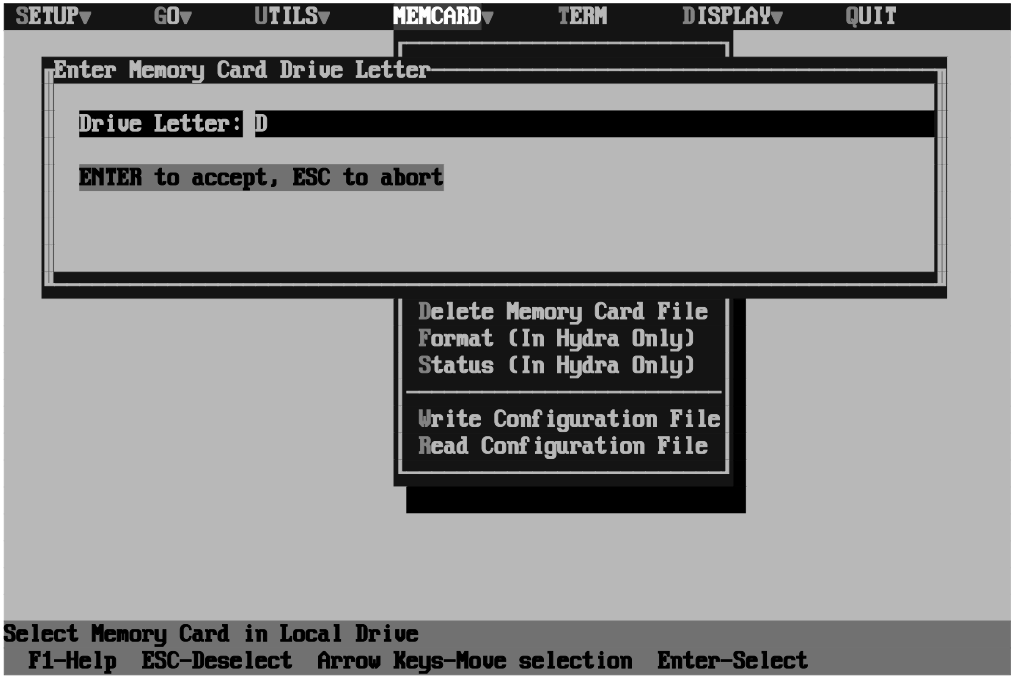


Figure 2-23. Card Location Menu

Directory Menu 2-25.

The “Directory” menu (Figure 2-22) queries the memory card installed in the selected drive for all files on the card. Typically, the file names have the extension *.HYD, where DATxx.HYD are data files and SETxx.HYD are setup (Hydra configuration) files. Since any DOS file can be written to card, other file names such as READ.ME or TESTFILE.SAV could appear in a directory. Normally, the card is reserved for *.HYD files because other files take up memory space.

The example in Figure 2-24 shows 13 files are on the memory card, using a total of 10184 bytes, leaving 239616 bytes for other files. The card size is identified as a 256K-byte card, the card read/write switch is in the Write Enabled position, and the card battery is OK. The date format is Month-Day-Year, and the time format is Hours:Minutes:Seconds (am or pm). If a “Decimal pt = ,” selection is made on the “Display” menu (Figure 2-33), the date format is Day-Month-Year, and the time is displayed in 24-hour format.

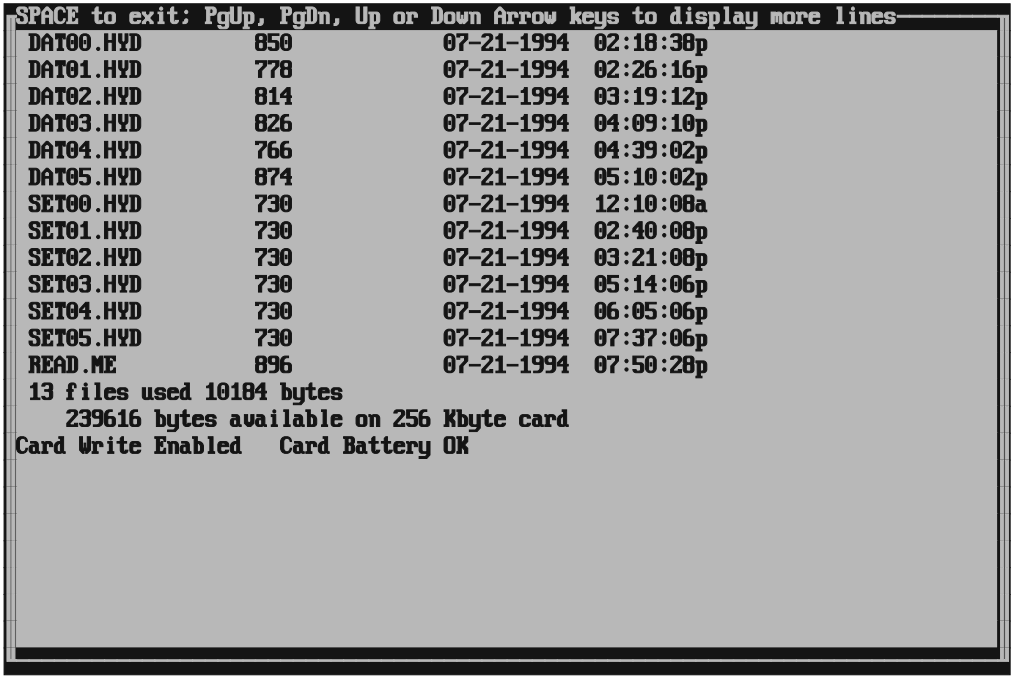


Figure 2-24. Directory Menu

Copy File Menu 2-26.

The “Copy File” menu (Figure 2-25) transfers a file from the memory card to the PC (Copy File to PC) or a file from the PC to the memory card (Copy File to Card). When a copy menu is selected, a window opens displaying the files that can be copied. After a file is selected, a window opens to allow the file to be renamed (if desired), and then another window that indicates the results of the copy. If the memory card drive is in Hydra, the RS-232 computer interface is established first. If this interface cannot be established, an error message appears. Check the RS-232 parameters set at Starter with the “Com” menu (Figure 2-2), check the RS-232 cabling, and verify that Hydra is powered and the memory card is valid.

The example in Figure 2-25 shows the file SET02.HYD is being copied from the PC to the instrument memory card. The example also shows a READ.ME file that has been copied to the memory card. (This file was created in word processing, in DOS, or from a text editor and describes the specific memory card function.)

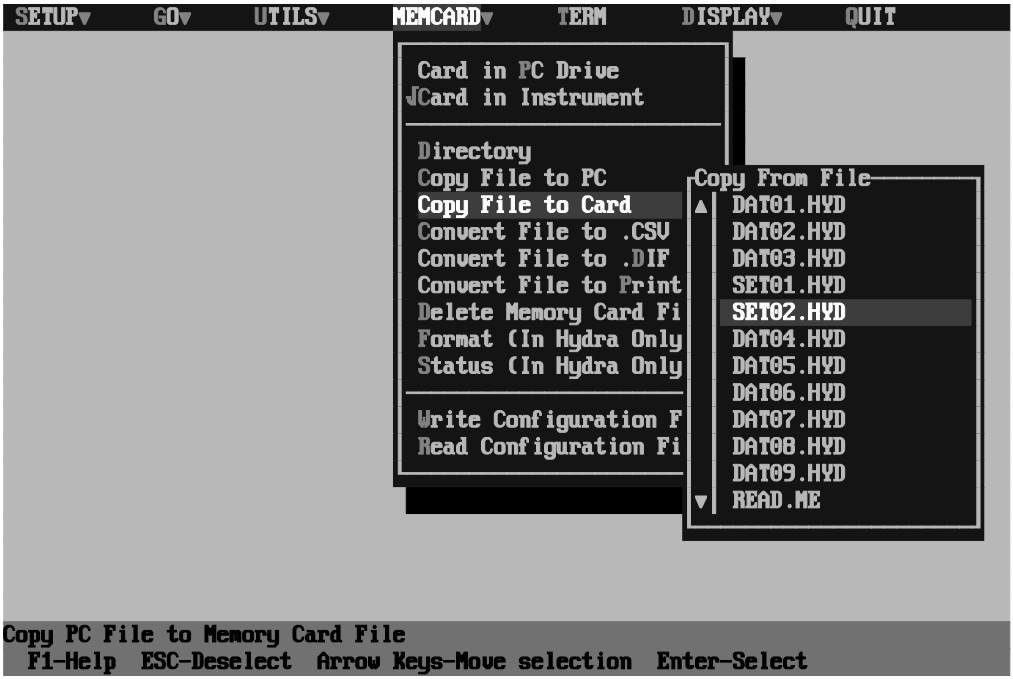


Figure 2-25. Copy File Menu

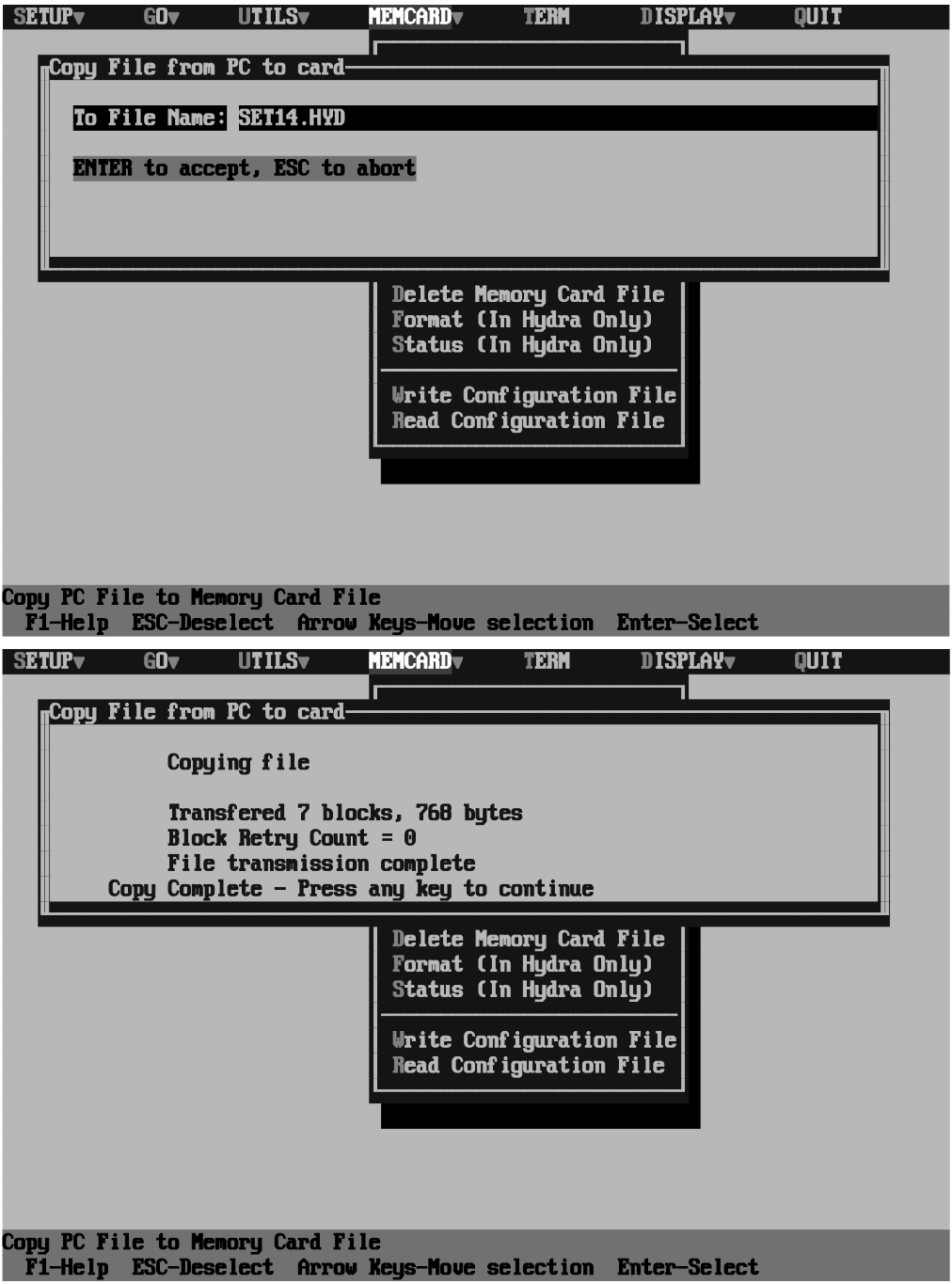


Figure 2-25. Copy File Menu (cont)

Convert File Menu 2-27.

The "Convert File" menu (Figure 2-26) allows memory card data files to be copied to the PC and converted into *.CSV (Comma Separated Variable), *.DIF (Data Interchange Format), or Print files. *.CSV and *.DIF files are used by spreadsheet and data analysis programs for data importation. The print conversion reformats the raw data into an ASCII print file for printing, word processing, or text editing operations.

The example in Figure 2-26 shows the memory card file DAT03.HYD will be copied to the PC and converted to a *.CSV file. Similar to copy operations (Figure 2-25), the file can be renamed, and a successful operation is noted. The file tag, entered when the active configuration file was written to the memory card (see Section 2-31), is written to the reader section of the *.CSV, *.DIF and Print files.

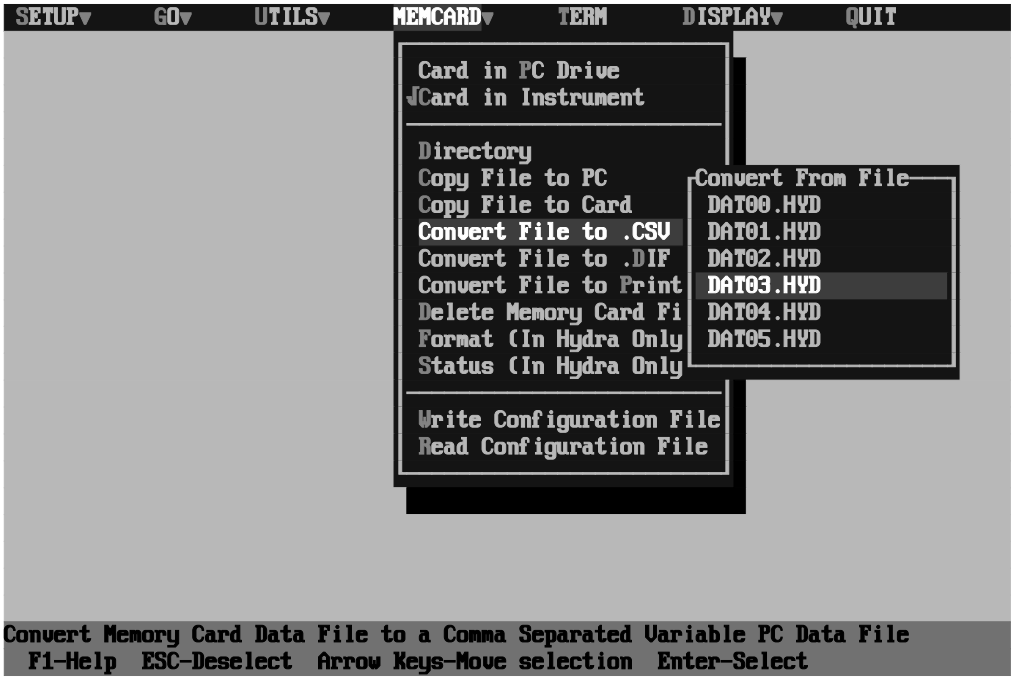


Figure 2-26. Convert File Menu

Delete Memory Card File Menu 2-28.

The “Delete Memory Card File” menu (Figure 2-27) calls up the directory on the memory card and allows a file to be selected for deletion.

The example in Figure 2-27 shows the file SET04.HYD will be deleted when the <ENTER> key is pressed. No warning message will be given. Be sure you want to delete the selected file before completing this operation.

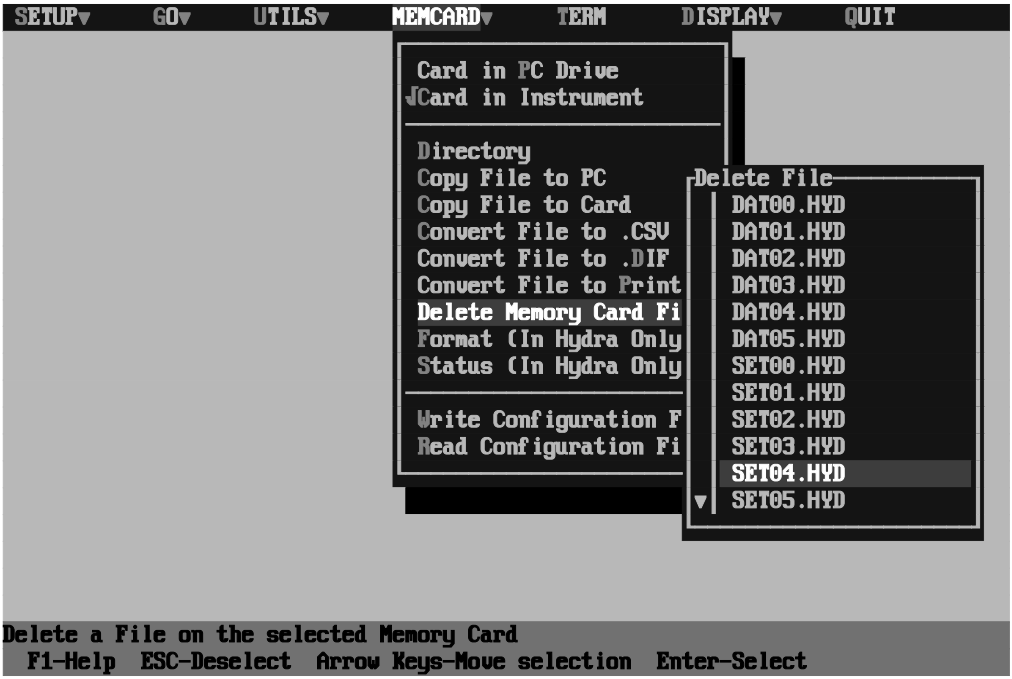


Figure 2-27. Delete Memory Card File Menu

Format (In Hydra Only) Menu 2-29.

The “Format (In Hydra Only)” menu (Figure 2-28) is used to totally erase the memory card in Hydra and format it in preparation for memory card operations. To format a memory card in a PC memory card drive, use the utility program supplied with the memory card drive. A warning window appears when this menu is selected to verify that the memory card should really be erased and reformatted. Enter Y (Yes) or N (No).

The example in Figure 2-28 shows a Y (Yes) response to the “Really Format the Card (Y or N):” warning.

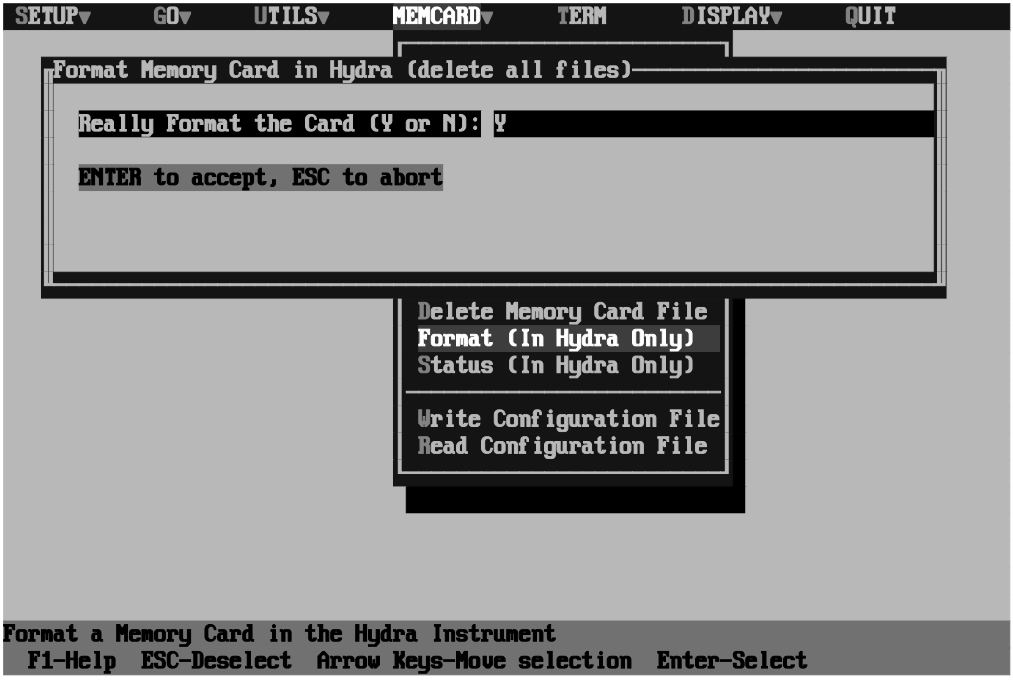


Figure 2-28. Format (In Hydra Only) Menu

Status (In Hydra Only) Menu 2-30.

The "Status (In Hydra Only)" menu (Figure 2-29) is used to check how many bytes are available on the card for memory card operations, to verify that the card is "Card Write Enabled," and that the battery internal to the card is O.K.

To determine the status of a memory card in a PC memory card drive, use the utility supplied with the memory card drive.

The example in Figure 2-29 shows 238592 bytes are available for memory card operations, the size of the card is 256K-bytes, the card is write enabled, and the battery is O.K.

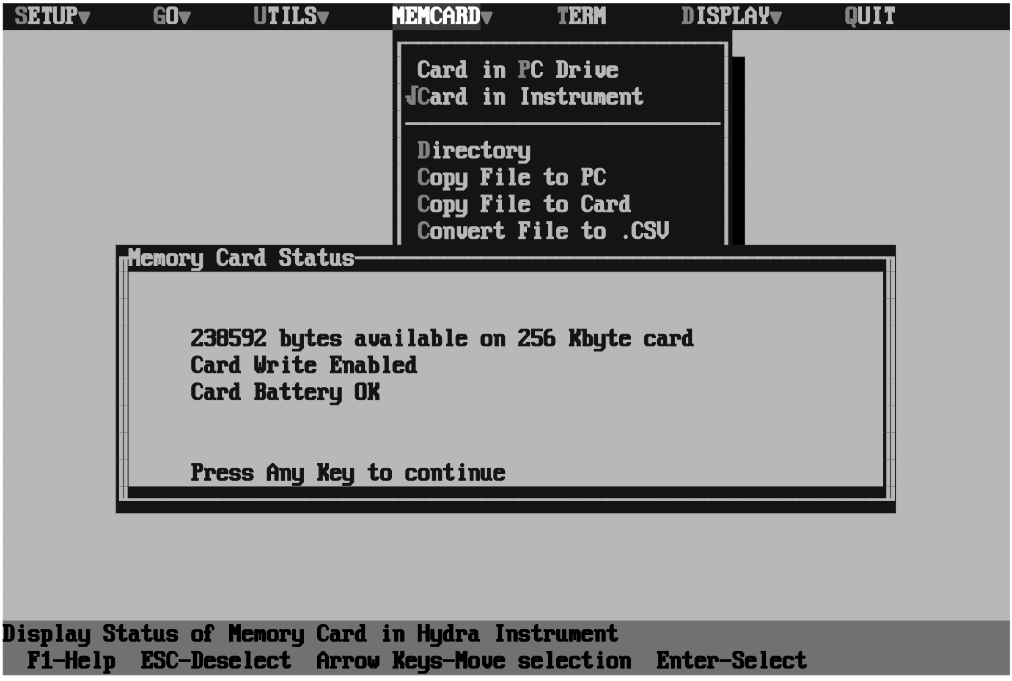


Figure 2-29. Status (In Hydra Only) Menu

Write Configuration File Menu 2-31.

The “Write Configuration File” menu (Figure 2-30) is used to save Hydra configuration stored in PC RAM to the memory card. From Hydra, the FILES front panel control is used to load this configuration into Hydra. The configuration file name must be in the form SETxx.HYD, where xx is a number from 00 to 99. If the file already exists on the card that file is overwritten. The configuration data in PC RAM originates from an “Upload Config.” menu (Figure 2-8), a “Load Config. Text” menu (Figure 2-11), a "Retrieve Setup" menu (Figure 2-15) or from a default configuration when Starter was initialized (binary or ASCII). To view the configuration before completing this menu, refer to the “Show Setup” menu (Figure 2-13).

The file tag is saved with the configuration file and is used as a comment on any data files recorded to the memory card after the configuration is loaded from this file.

The example in Figure 2-30 shows the that configuration in PC RAM will be copied to the memory card with the name SET26.HYD, and the tag is "Power Supply Test."

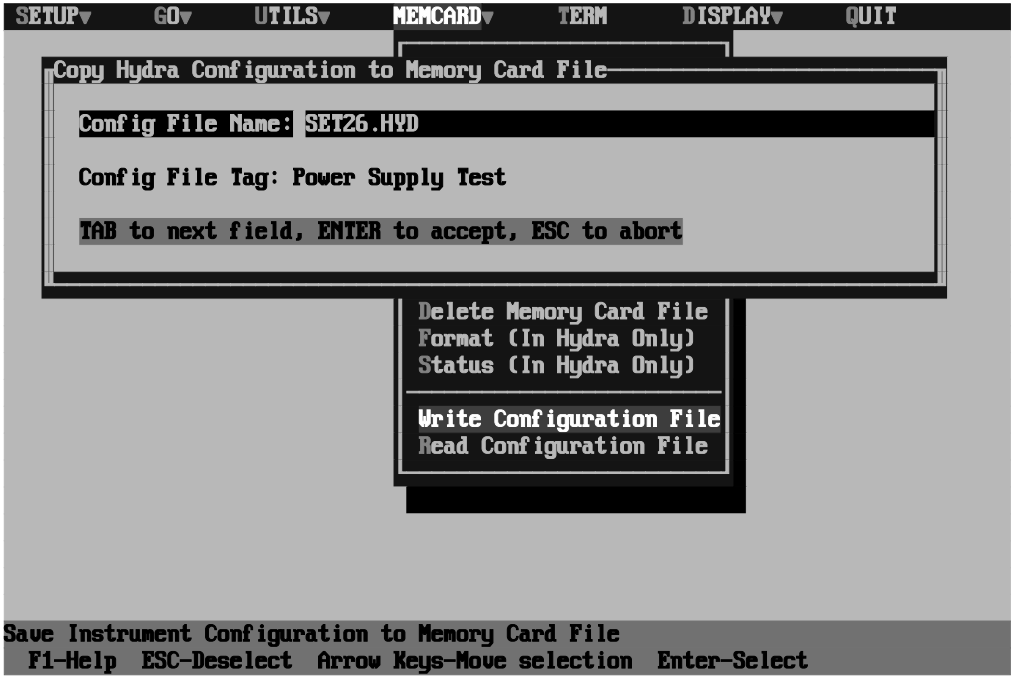


Figure 2-30. Write Configuration File Menu

Read Configuration File Menu 2-32.

The “Read Configuration File” menu (Figure 2-31) is used to load a SETxx.HYD file on the memory card into PC RAM. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. To view this configuration after this menu, refer to the “Show Setup” menu (Figure 2-13). The configuration can be saved by using the “Save Config. Text” (Figure 2-10) or "Store Setup" (Figure 2-14) menus.

The example in Figure 2-31 shows the memory card file SET04.HYD will be loaded in PC RAM.

Figure 2-31. Read Configuration File Menu

TERM MENU 2-33.

The “TERM” (Terminal) menu (Figure 2-32) starts a terminal emulator mode to communicate directly with Hydra via the RS-232 computer interface. The Hydra computer command set can be used (see the Users Manual) to diagnose problems with the computer/Hydra interface, display Hydra model and software versions, and exercise the command set.

The example in Figure 2-32 shows the entry of several commands. The IDN? command returned a string that identifies the instrument model and software versions. A successful command execution returns the “=>” prompt. The FUNC 0, VDC, 4 command configured channel 0; the TEMP_CONFIG 3 command enabled “Open Thermocouple Detect,” and set the temperature scale to °F; the TOTAL_DBNC 1 command enabled the totalizer contact debounce feature; the LOCK 0 command unlocked all Hydra front panels keys. Refer to the Users Manual for more information about these and other interface commands.

Figure 2-32. TERM Menu

DISPLAY MENU 2-34.

The "DISPLAY" menu (Figure 2-33) gives a choice of a light background or dark background. The Decimal Pt (Point) allows you to specify numbers with periods or commas as decimal points. The Separator refers to the character used to separate the fields in data files (Figure 2-6) as follows:

Separator = ,	12.345,23.456,34.567
Separator = ;	12,345;23,456;34,567
Separator = TAB	12,345 23,456 34,567

These selections also set the date-reporting format Month/Day/Year (decimal point ".") or Day/Month/Year (decimal point ",").

"PC Memory Remaining" reports the conventional DOS memory available after Starter is loaded. If the PC is overloaded with software programs, the Memory Left could fall below 32000 bytes, which is the minimum number for Starter to perform properly. If this happens, functions like the "Show Setup" menu (Figure 2-13) may cause "Not Enough Memory" error messages.

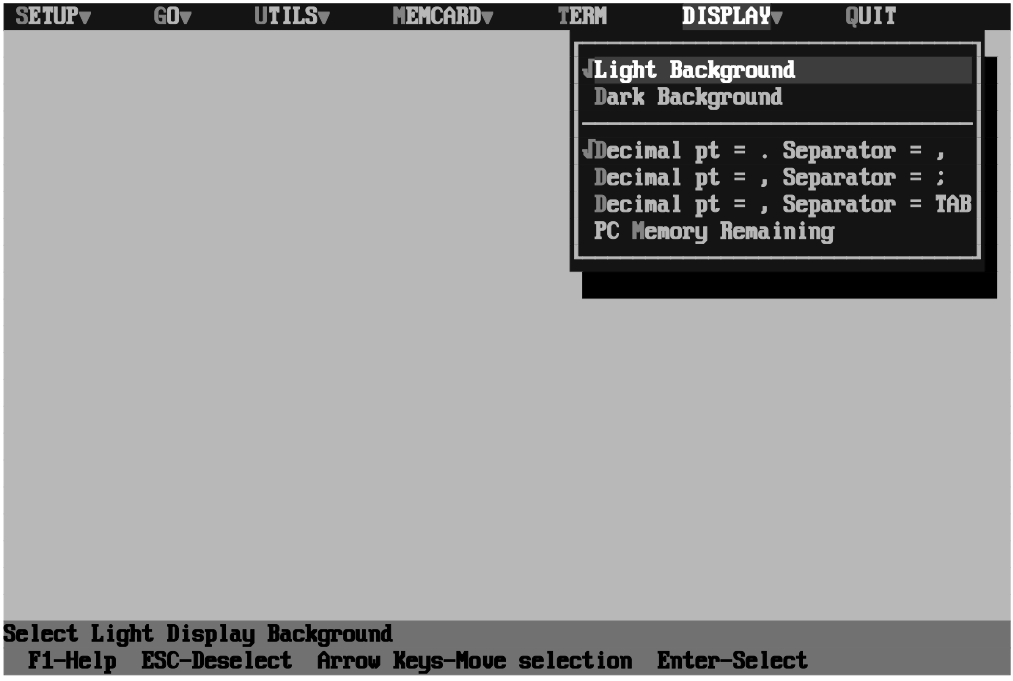


Figure 2-33. DISPLAY Menu

QUIT MENU 2-35.

The "QUIT" menu (Figure 2-34) is used to exit the Starter program. When Starter is initialized, the file STARTER.INI provides program and instrument defaults, as does any subsequent "Retrieve Setup" menu selection (Figure 2-15). If any default was changed during operations, the program asks if the changes should become the new defaults (changes saved) before quitting. If you select Y (Yes), a window requests the name of the initialization file in which to store the changes. This can be the current initialization file, a different file, or a new file to be created. If you select N (No), the changes to the defaults are not changed, and the next window verifies the Quit operation, where Y will exit the program, and N will return to the main menu.

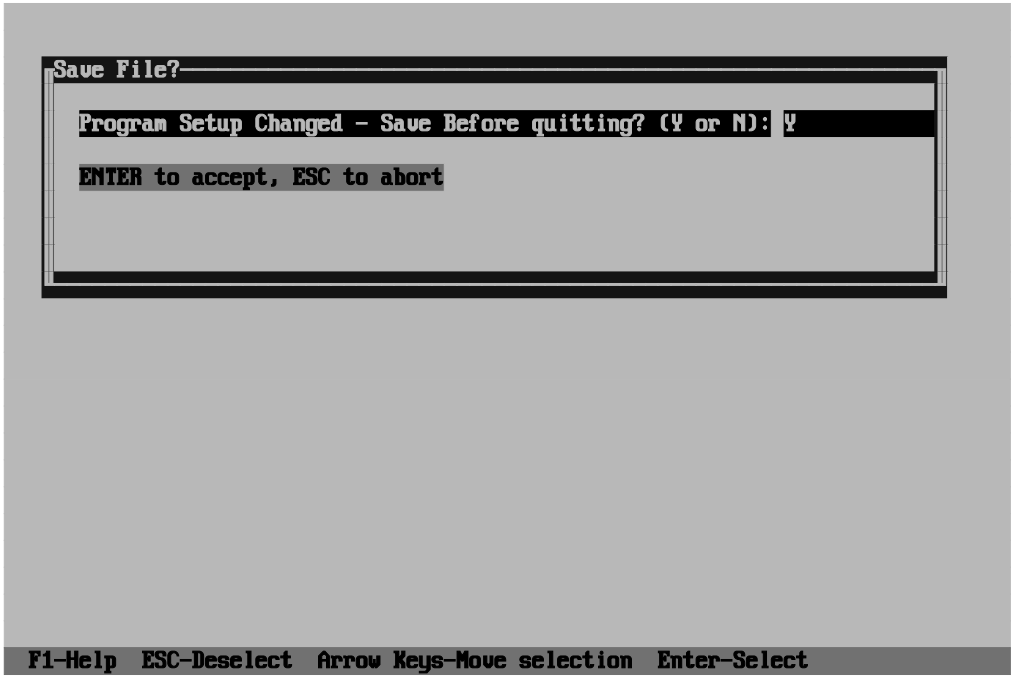
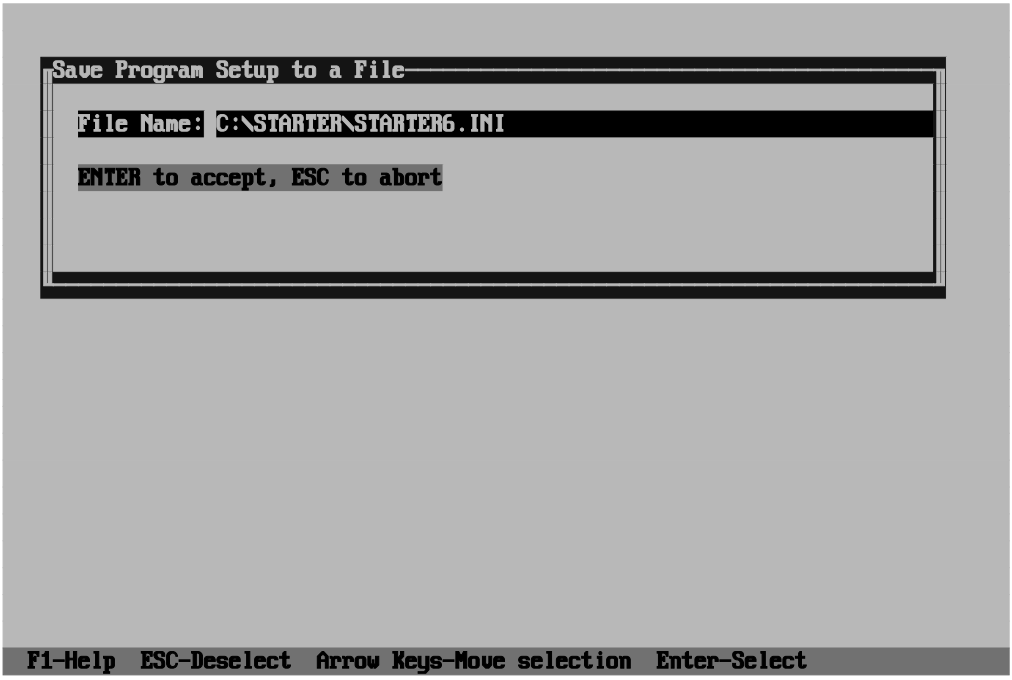


Figure 2-34. QUIT Menu



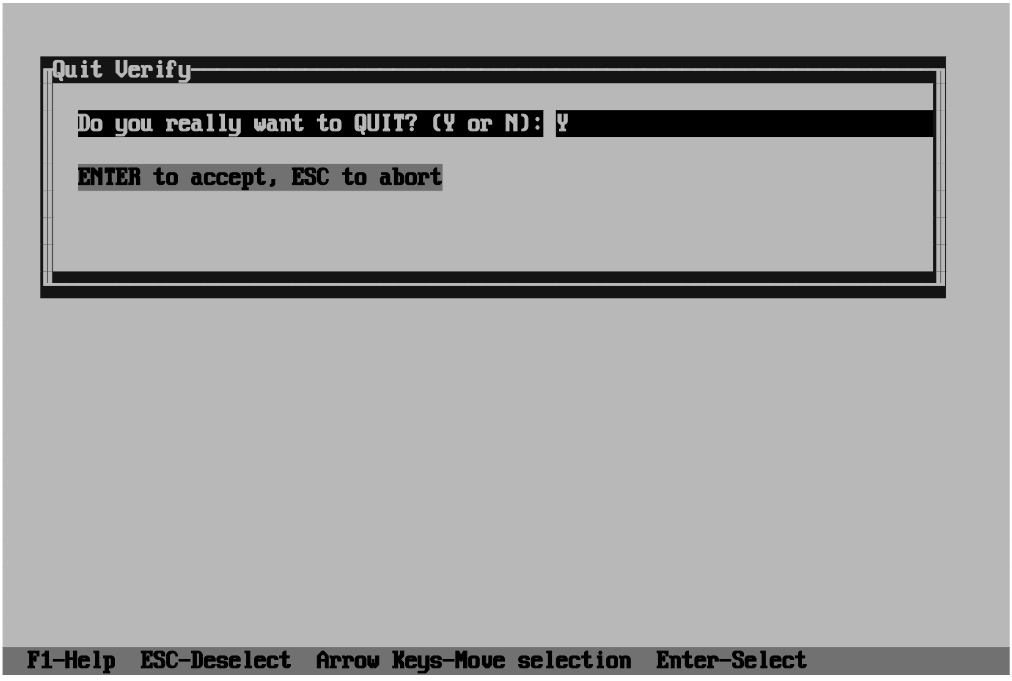


Figure 2-34. QUIT Menu (cont)

Section 3
Typical Operations

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SUMMARY OF TYPICAL OPERATIONS 3-1.

This section provides a collection of typical operations that use the menus and windows described in Section 2.

SELECTING THE DISPLAY MODE 3-2.

The PC display options and selection of the numbers decimal point (“.” or “,”) can be selected by opening the “DISPLAY” menu (Figure 2-33). While in this menu, check the “Memory Left” display to verify that the PC has sufficient memory to operate Starter.

TESTING THE RS-232 INTERFACE 3-3.

Complete the following procedure to use the terminal emulation (TERM) feature to test the operation of the RS-232 link.

1. At the PC, open the “Com” menu (Figure 2-2) and select the baud rate and parity that matches the setting in Hydra. Be sure "CTS" is on in a Model 2635A Data Bucket when setting the Hydra communication parameters.
2. If a modem is being used, continue by opening the “Setup Modem” menu (Figure 2-3), and establish modem communications. (Note that generally the modem is prepared for operation before Starter is initialized, so all that Starter has to do (and can do) is initiate a call.)
3. Open the “TERM” menu (Figure 2-32) and wait for the “=>“ prompt, which indicates connection with Hydra. With AutoBaud, up to 60 seconds may be required to establish the link, depending on the baud rate of Hydra. If an error message, “Couldn’t Establish Interface” is returned, then Hydra is not powered, there is an RS-232 cabling problem, or there is a problem with the PCs COM port..
4. When communications are established, press the <ENTER> key a few times and observe the => returns. See the Hydra Users Manual for a description of the command set that can be used over the RS-232 interface.

CONFIGURATION FILES 3-4.

Typical operations for saving, loading, and printing Hydra configuration files are described in the following paragraphs. Since Starter does not configure Hydra directly, all configurations originate at Hydra by operating the front panel controls for the desired application.

Saving a Hydra Configuration as the Starter Default File 3-5.

Complete the following procedure to save a Hydra configuration as the default settings for Starter.

1. At Hydra, configure all channels and parameters for their default settings.
2. At the PC, upload the configuration into PC RAM using the "Upload Config." menu (Figure 2-8).
3. Open the "Show Setup" menu (Figure 2-13) to verify Hydra configuration.
4. Open the "Store Setup" menu (Figure 2-14) to save the configuration as a setup file. For example, STARTER6.INI.

Loading a Starter Default Configuration File into Hydra 3-6.

Complete the following procedure to load a Starter default configuration file into Hydra.

1. At the PC, initialize Starter with the desired default setup file using the /F switch (see Section 1), e.g., STARTER /FNAME.INI, where NAME.INI is the configuration file, or after Starter is running, use the "Retrieve Setup" menu (Figure 2-15) to select and initialize with a setup file.
2. Open the "Show Setup" menu (Figure 2-13) to verify Hydra configuration. The "Trigger", "Interval Scan" and "Scan Interval" parameters can be changed in Starter by using the "Scan Trigger Type" menu (Figure 2-4) and "Scan Interval" menu (Figure 2-5).
3. Download the configuration to Hydra using the "Download Config." menu (Figure 2-9).
4. At Hydra, verify the configuration change was successful.

Saving a Hydra Configuration as a PC Configuration File 3-7.

Complete the following procedure to save the present Hydra setup as a PC configuration file (saved in ASCII text).

1. At Hydra, configure all channels and parameters for the desired settings.
2. At the PC, upload the configuration into PC RAM using the "Upload Config." menu (Figure 2-8).
3. Open the "Show Setup" menu (Figure 2-13) to verify Hydra configuration.
4. Open the "Save Config. Text" menu (Figure 2-10) to save the configuration as a configuration file. For example, CONFIG12.CFG.

Loading a PC Configuration File into Hydra 3-8.

Complete the following procedure to load a previously saved configuration file (saved in ASCII text) into Hydra.

1. At the PC, open the "Load Config. Text" menu (Figure 2-11) and select the desired *.CFG (configuration) file.
2. Open the "Show Setup" menu (Figure 2-13) to verify Hydra configuration. The "Trigger", "Interval Scan" and "Scan Interval" parameters can be selected in Starter by using the "Scan Trigger Type" menu (Figure 2-4) and "Scan Interval" menu (Figure 2-5).
3. Download the configuration to Hydra using the "Download Config." menu (Figure 2-9).
4. At Hydra, verify the configuration change was successful.

Printing a PC Configuration File 3-9.

Complete the following procedure to print a previously-saved configuration file. Configuration files can be printed out directly because they are in ASCII text; however, they are formatted for Starter and are difficult to interpret.

1. At the PC, open the "Load Config. Text" menu (Figure 2-11) and select the desired *.CFG (configuration) file.
2. Open the "Show Setup" menu (Figure 2-13) to verify Hydra configuration.
3. Open the "List Setup" menu (Figure 2-12) to save the Show Setup menu as an ASCII text file (*.LST), for example, CONFIG10.LST.
4. Quit Starter (Figure 2-34) and use DOS commands, a text editor, or word processing application to print out the *.LST file.

DATA FILES 3-10.

Data files contain measurement data that was transferred over the RS-232 interface from Hydra to Starter or saved on the Model 2635A Data Bucket memory card. The raw data files can be printed out only if recorded in ASCII, or they can be translated for spreadsheet and other data management applications. For the Model 2625A Data Logger, data can be stored in the logging memory (up to 2,047 scans) and extracted into a data file. The Model 2620A Data Acquisition Unit does not have a logging memory.

For the Model 2635A Data Bucket, measurement data may be transferred to Starter via the RS-232 interface, or stored on the memory card. Memory card data files are in binary format and must be translated by Starter before use.

Opening Data Files 3-11.

To open a data file for the collection of measurement data, refer to the "Data File" menu (Figure 2-6). The selections made can be viewed in the "Show Setup" menu (Figure 2-13).

Printing Data Files 3-12.

To print a data file, open the "File Translation" menu (Figure 2-20) and select the "Convert File to Print" option. Quit Starter (Figure 2-34) and use your word processing or text editing applications or DOS commands to print out the measurement data file in a readable format.

Translating Data Files 3-13.

Data files selected with the "Data File" menu (Figure 2-6) can be translated to comma-separated variable format (*.CSV), data interchange format (*.DIF), and print format. To translate a file, refer to the "File Translation" menu (Figure 2-20).

Data Files and the Logging Memory 3-14.

The Model 2620A Data Acquisition Unit has no internal logging memory. For this instrument, opening the "Show Setup" menu (Figure 2-13) will always report "Logging Memory Disabled."

The Model 2625A Data Logger has an internal logging memory that is selectable at Hydra front panel using MODE. Up to 2047 scans are saved in this memory. For the Model 2625A, opening the Show Setup menu will report (when Logging Memory for data destination and All is selected for data mode) "Logging all Scan Data to Memory."

When data is recorded in the logging memory, it is uploaded from Hydra to the PC and into a data file by opening the "Upload Memory" menu (Figure 2-7). Once the data is in a data file, it can be handled like any other data file (as described above).

SCANNING 3-15.

Starter can record measurement data only when scanning is initiated at the PC. Scanning initiated at Hydra by pressing the SCAN key will not result in measurement data being saved in Starter. Open the "GO" menu (Figure 2-16) to enable scanning.

USING DOS UTILITIES 3-16.

Starter uses the following file types with the following default file extensions: initialization files (*.INI), configuration text files (*.CFG), list setup files (*.LST), memory card files (*.HYD) (Model 2635A Data Bucket only), and data measurement files in raw format, comma-separated variable format (*.CSV), data interchange format (*.DIF), and print format. These, and any related files created by the user, can be manipulated with the Starter DOS utilities. To use the DOS utilities, including Directory, Rename, Delete, Copy Change Directory, and DOS prompt (for other DOS functions), open the "DOS Utilities" menu (Figure 2-21).

MEMORY CARD 3-17.

Memory card operations (Model 2635A Data Bucket only) are described in the "MEMCARD" menu (Figure 2-22). Memory card files (*.HYD) are in two types: DATxx.HYD and SETxx.HYD, where xx represents a two-digit number from 00 to 99. The DATxx. HYD files contain measurement data and are treated like Starter data files, including translation and file handling. The SETxx.HYD files are setup (configuration) files and are transferred to and from Hydra in the same manner as Configuration files (discussed above).

SIMULATION MODE 3-18.

The simulation mode puts a "Measurement Display" menu on the screen (Figure 2-17) and sequences numbers to give the appearance of measurement scanning. The simulation mode is entered by opening the "GO" menu (Figure 2-16) and selecting "Simulated Data Collection."

Appendix A
File Formats

THE DATA FILE A-1.

Starter data files are maintained in either binary or comma-separated ASCII format, as selected during setup. The binary format is much more compact than the ASCII format, but ASCII format is needed for compatibility with data analysis and management tools running simultaneously in other computers on a network.

Data files are opened in SHARED mode with write blocked. This enables network reads but prevents writes of the data file while scan data is being recorded. Between scans, the file is closed, allowing full network access to the file (including delete if allowed by the security level enabled on the PC). If the file disappears between one scan and the next, a new file (including header and with the previous file name) is created automatically before the next set of scan data is recorded.

Binary File Format A-2.

The binary file format is as follows:

FILE HEADER	TAG - 1 byte (contents = FF hex)
File Name -	81-character string
Time Count -	4 bytes (long integer - seconds past midnight 1/1/70)
Comment -	80-byte string
Hydra Count -	1 byte (1)
Spare -	1 byte (to get word alignment)
Units -	(23) 9-byte strings.
DATA RECORDS	(One for each Scan recorded)
Time Count -	4 bytes (long integer - seconds past midnight 1/1/70)
Channel Readings -	84 bytes (21, single precision (4 byte), IEEE format, floating point numbers)
Totalizer -	4 bytes (long integer - the extended totalizer maintained by the Starter software)
Digital and Alarms I/O -	2 bytes (a 16 bit integer with bits 0-7 bits representing the digital I/O state and bits 8-11 the alarm I/O state)

Each scan record consists of the current time (a 32-bit unsigned integer) plus 21 floating-point numbers (84 bytes) reflecting the readings from all channels. The readings section is followed by a floating-point number (4 bytes) for the totalizer, followed by a 16-bit (2-byte) integer for the Digital Input/Output. If a measurement channel is off, 0.0 is recorded for the reading.

In this format, slightly less than 100 bytes will be consumed for each scan recorded, so 10,000 scans can be recorded in a 1M-byte file.

Comma-Separated ASCII File Format A-3.

The comma-separated ASCII file format is as follows (<EOL> means "end of line marker"):

File name string (< 64-character string) <EOL>
Date and time file was created<EOL>
File comment (<80-character string) <EOL>
Number of Hydras being logged (1 character) <EOL>
Channel Units string (21 comma-separated strings) <EOL>
Scan Record 1<EOL>
Scan Record n<EOL>

Each scan record consists of the time (in seconds past midnight, 1/1/70, or ASCII time/date string) and a comma separated list of channel readings (including the totalizer and digital input/output). The strings are surrounded by quotes so they can be directly imported to Excel™, Lotus 1-2-3™ and other data analysis and presentation packages.

In this format, each scan consumes about 250 bytes. A 1M-byte file can hold about 4,000 scans.

CHANNELS AND INSTRUMENT CONFIGURATION TEXT FORMAT A-4.

This file is an image of the Hydra commands necessary to configure all 21 channels in Hydra. It is an ASCII text format and can be read or edited by the user.

Excel™ is a trademark of Microsoft Corporation. Lotus 1-2-3™ is a trademark of Lotus Corporation.

PROGRAM SETUP FILE FORMAT A-5.

This file is used to save the user-entered data collection setup parameters. The file is in binary format and is read during program startup to set the default values for the session.

You may overwrite this file with the current setups via functions in the Setup menu. You may also restore the setups to what is in the file by the same means.

Until a setup file is retrieved from the disk, the following setup defaults will be active:

Setup File Name	STARTER.INI
Data File Name	LOGDATA.DAT
Conf. Text File	CONFIG.CFG
Format	ASCII
Function	Append
Comment	Blank
Trigger Type	Interval (external and mon alarm disabled)
Scan Interval	10 seconds
Interface	RS-232 (COM1)
Baud Rate	9600
Parity	None