Printing, Mass Storage, and Other Utilities

Press \( \text{UTILITY} \) to access the primary menus for:

- Hard-copy settings
- Time and date settings for the real-time clock
- GPIB and RS-232-C settings
- Mass storage utilities
- Special modes of operation (including offset behavior, sequence time-out, cursor units, autocalibration, and Remote Control Assistant)
- Signal function at the CAL BNC connector (magnitude, frequency, shape, trigger out, pass/fail use)

**Hardcopy Setup** (page 19–2)
Use this to access a secondary menu for viewing or changing printer and plotter settings.

**Time/Date Setup** (page 19–4)
Use this to access a secondary menu for adjusting the real-time clock displayed in the upper left-hand corner of the screen.

**Remote Setup** (page 19–5)
Use this to access secondary menu for viewing or changing interface settings.

**Mass Storage Utilities** (page 19–11)
This is for accessing the “Mass Storage UTILITIES” menus.

**Special Modes** (page 19–20)
This is for accessing the “Special Modes” menus.

**CAL BNC Setup** (page 19–24)
This is for accessing the “CAL BNC” menus.
HARDCOPY

These menus appear when you select “Hardcopy Setup” from UTILITIES.

output to
Use this to select the device to which the instrument is to output data. This menu shows the options installed in the instrument. The device can be either a port (GPIB, RS-232, or Centronics) to which a printer is connected, a storage unit such as floppy disk or portable hard disk (HDD), or the internal printer. If you select a port, you should check the “GPIB & RS232” menu to ensure that settings are correct. File names are assigned automatically when you are copying to storage units.

page feed
When you select On this starts a new page each time you press SCREEN DUMP. Pressing SCREEN DUMP makes a copy of the screen display.

printer
Use this to select the type of printer (see Appendix A), plotter (HP 7470, HP 7550 only), or graphic file types (TIFF, BMP, HPGL) by means of the corresponding menu buttons or knob.

format
This is for choosing Portrait or Landscape formats (becomes available depending on “printer” choice).

Background (not shown)
This menu becomes available when TIFF color, BMP color, or BMP compr is chosen, and gives either a “Black” or “White” background to the hard-copy printout.

plot size (not shown)
This menu becomes available only when a plotter is selected. It is used for choosing the desired size: A4 (11" × 8.5"), A5 (8.5" × 5.5").

pen number (not shown)
This menu becomes available only when a plotter is selected. It is used for choosing the number of pens installed (the instrument assumes that the pens are loaded consecutively in the lower slots).
## HARDCOPY — Internal Printer

<table>
<thead>
<tr>
<th>output to</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Int. Printer</td>
<td></td>
</tr>
<tr>
<td>Card</td>
<td></td>
</tr>
<tr>
<td>Flopy</td>
<td></td>
</tr>
<tr>
<td>HDD</td>
<td></td>
</tr>
<tr>
<td>GPIB</td>
<td></td>
</tr>
</tbody>
</table>

| auto print      | Off            | On            |

| cm/division     | 1 2 5 10 20 50 100 200 |

| Format          | Portrait       | Landscape     |

### output to

Use this to select the device to which the instrument is to output data. This menu shows the options installed in the instrument. The device can be either a port (GPIB, RS-232, or Centronics) to which a printer is connected, a storage unit such as floppy disk or portable hard disk (HDD), or the internal printer. If you select a port, you should check the “GPIB & RS232” menu to ensure that settings are correct. File names are assigned automatically when you are copying to storage units.

### auto print

This is for generating a hard copy of the screen and for sending it to the internal printer after every acquisition.

### cm/division

This is for selecting the expansion factor.

### format

This is for choosing either **Portrait** or **Landscape** formats.

---

**Note:** A “persistance” trace cannot be expanded, nor do cursors show on an expanded printout.
Time/Date Setup

These menus appear when you select Time Date Setup from UTILITIES.

SET CLOCK FORWARD ONE HOUR
This is for changing to summer time.

SET CLOCK BACKWARD ONE HOUR
This is for changing back to standard time.

LOAD CHANGES NOW
Use this to activate the changes made with the “Hour Min Sec” and “Day Mnth Year” buttons and knobs (see below).

Hour/Min/Sec
Use the corresponding menu button to advance through Hour, Minutes, and Seconds; and the associated menu knob to adjust the value.

Day/Mnth/Year
Use the corresponding menu button to advance through Day, Mnth, and Year; and the associated menu knob to adjust the corresponding value.
GPIB/RS232 Setup

When “GPIB/RS232 Setup” is selected from UTILITIES the RS-232-C port on the rear panel can be used for remote operation of the DDA and for direct interfacing to a hard-copy device for copying of displayed waveforms and other screen data.

A printer unit connected to the DDA through the RS-232-C port can be controlled from a host computer by means of the DDA’s GPIB port. The instrument’s built-in drivers also allow hard copies to be made without an external computer.

The Remote Control Assistant feature allows automatic monitoring and detection of errors during remote-control operation (page 19–21).

### RS-232-C Connector Pin Assignments

<table>
<thead>
<tr>
<th>DB9 Pin No.</th>
<th>Line Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>T × D</td>
<td>Transmitted Data (from the DDA).</td>
</tr>
<tr>
<td>2</td>
<td>R × D</td>
<td>Received Data (to the DDA).</td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
<td>Request To Send (from the DDA). If the software Xon/Xoff handshake is selected, it is always TRUE. Otherwise (hardware handshake) it is TRUE when the DDA is able to receive characters and FALSE when the DDA is unable to receive characters.</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td>Clear To Send (to the DDA). When TRUE, the DDA can transmit; when FALSE, transmission stops. It is used for the DDA output hardware handshake.</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td>Data Terminal Ready (from the DDA). Always TRUE.</td>
</tr>
<tr>
<td>5</td>
<td>SIG GND</td>
<td>Signal Ground</td>
</tr>
</tbody>
</table>

Corresponds to a DTE (Data Terminal Equipment) Configuration
**GPIB & RS232**

These menus appear when you select **Remote Setup** from UTILITIES.

**Remote Control from**

This is for selecting the port for remote control.

**RS232 Mode**

Use this to select 7–bit or 8–bit mode for RS-232 communication. When **RS232** is selected, the GPIB interface is in “talk only” mode. Any change becomes effective immediately.

**Parity**

Use this to select **odd** or **even** parity, or **none**, for RS-232 communication.

**Stop bits**

This is for selecting the number of stop bits for RS-232 communication.

**Baud Rate**

Use this to set the Baud Rate for RS-232 communication by means of the associated menu knob.

**GPIB Device (Address)**

Use this to choose the appropriate GPIB address.
RS-232-C Printer and Computer Cabling

RS-232 cabling for printers can be used in almost every case.

RS-232 nine-pin communication cabling for computers.
Mass Storage Utilities

When “Mass Storage Utilities” is selected from “UTILITIES” the “MASS STORAGE” menu group appears (page 19–11) to give access to the mass storage file system controls. The system supports storage and retrieval of data files to and from memory cards, floppy disks, and removable hard disk (HDD) media.

Memory Card Format

The Memory Card structure, based on the PCMCIA II / JEIDA 4.0 standard, and as found in any DOS floppy or hard disk, consists of a DOS partition containing files. The DDA formats the card in segmented, contiguous sectors, each of 512 bytes. The DDA does not support error detection algorithms such as CRCs or checksum inserted between the sectors. When this is done, the instrument may only be able to read from the card, but not write to it.

Floppy Disk Format

The floppy supports DOS 1.44 MB and 720 kB formats.

Hard Disk (HDD) Format

The removable hard disk structure is based on the PCMCIA III / JEIDA 4.0 standard. The drive is arranged as a DOS partition containing files as in any DOS floppy or hard disk.

The HDD format uses 512 bytes per sector and four sectors per cluster. One cluster is the minimum file size: any files smaller than 2048 bytes in size will still use one cluster's allocation of 2048 bytes of disk space. A total of 500k ASCII records can be saved to the HDD portable hard drive.

Subdirectories

All files are written to, and read from, the media from the current working directory. The default name of the working directory is LECROY_1.DIR. This directory is automatically created when the media are formatted. If the media are formatted elsewhere (for example, on a PC) the directory will be created the first time a file is saved to the memory card, floppy disk, or removable hard disk.

The working directory can be changed to any valid DOS directory name by means of the file name preferences menu. All working directories are created as subdirectories from the root directory.

The maximum number of files allowed in any one directory is 2400.
**File Naming Conventions**

As in MS-DOS, the file name can take up to eight characters, followed by an extension of three characters.

A file is treated as:
- Panel setup if its extension is PNL
- Waveform if its extension is a 3-digit number
- Waveform template if its extension is TPL
- Hard copy if its extension is TIF, BMP, or PRT.
- HPGL if its extension is PLT. See also “Key to Terms” below.

The instrument has a predefined naming convention for the 8-character file names and directory names, and these default names can be customized, as shown in this table. If the new file being stored has the same name as an existing file on the same storage medium, the old file will be deleted.

<table>
<thead>
<tr>
<th>Type</th>
<th>Default Name</th>
<th>Customized Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manually stored waveform files</td>
<td>Stt.nnn</td>
<td>xxxxxxxx.nnn</td>
</tr>
<tr>
<td>Automatically stored waveform files</td>
<td>Att.nnn</td>
<td>xxxxxxxx.nnn</td>
</tr>
<tr>
<td>Panel files</td>
<td>Pnnn.PNL</td>
<td>xxxxxxxn.PNL</td>
</tr>
<tr>
<td>Hard copy files</td>
<td>Dnnn.TIF</td>
<td>xxxxxxxn.TIF</td>
</tr>
<tr>
<td></td>
<td>Dnnn.BMP</td>
<td>xxxxxxxn.BMP</td>
</tr>
<tr>
<td></td>
<td>Dnnn.PRT</td>
<td>xxxxxxxn.PRT</td>
</tr>
<tr>
<td></td>
<td>Dnnn.PLT</td>
<td>xxxxxxxn.PLT</td>
</tr>
<tr>
<td>Template files</td>
<td>LECROYwTPL</td>
<td>Cannot be changed</td>
</tr>
<tr>
<td>Directory name</td>
<td>LECROY_1.DIR</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>Sttnnn.TXT</td>
<td>xxxxxxxx.TXT</td>
</tr>
<tr>
<td>MATLAB</td>
<td>Sttnnn.DAT</td>
<td>xxxxxxxx.DAT</td>
</tr>
<tr>
<td>Mathcad</td>
<td>Sttnnn.PRN</td>
<td>xxxxxxxx.PRN</td>
</tr>
</tbody>
</table>

**Key to Terms**

- **x**: any legal DOS file-name character
- **tt**: the trace name of C1, C2, C3, C4, TA, TB, TC, TD
- **nnn**: a 3-digit decimal sequence number starting at 001 that is automatically assigned
- **w**: the template version number: for example, for a version 2.2, the template is saved as LECROY22.TPL
- **TIF, BMP**: hard copy graphic image files
- **PRT**: hard copy printer files.
- **PLT**: HPGL plotter/vector files
Auto-Store Waveform

File Naming

The default notations for waveform files are Stt.nnn for manually stored files and Att.nnn for automatically stored files. The characters S and A represent the two storage methods.

When automatically generating a file name, the system uses the assigned name plus a 3-digit sequence number. If the assigned waveform name is already in the default ‘Stt’ form (such as SC1, STB) the name will be modified to the ‘Att’ form: AC1, ATB, and so on. All other user assigned names remain as entered.

More on Auto-Stored Files

If Fill is selected and default names are used, the first waveform stored will be Axx:001, the second Axx:002, and so on. The numbering scheme continues in this manner until the storage medium is filled, the file number reaches 999, or there are more than 2400 files in the current working directory.

If Wrap is selected, the oldest autostored waveform files will be deleted whenever the medium becomes full. The remaining autostored waveform files will be renamed — the oldest group of files will be named “Axx:001,” the second oldest “Axx:002,” and so on.

The current sequence number is deduced by a check of all file names in the working directory, regardless of file type — panel, hard copy, or waveform. The highest occupied numeric file name extension of the form ‘nnn’ is found and incremented by one. The new number is used as the current generation number for storage operations.

Deleting Files

When a file generation is deleted, all files designated with the 3-digit sequence number of the file name extension will be deleted, regardless of file type.

Media Size/Storage Availability

The mass storage file system indicates media size and storage availability in kilobytes where 1 kilobyte = 1024 bytes. Many media manufacturers specify the available storage in Megabytes where 1 Megabyte = 1 million bytes. This results in an apparent mismatch in specified versus actual media storage availability, when in fact the availability in bytes is identical.

Write Protect Switch

If the write protection switch of the card or floppy being used has been pushed to the active position, the message “Device is Write Protected” will be displayed on the upper part of the grid whenever the medium is accessed for writing.
**SRAM Card Battery**

The SRAM memory card contains a button-size battery for preserving data. When this needs replacing, the message “BAD BATTERY” appears. The battery can and should be changed while the memory card is still in the DDA, in order to prevent loss of data. To access the battery, remove the panel on the bottom edge of the card by removing the small screw.

**MASS STORAGE**

This offers the primary menus for controlling mass storage. The range of utilities available depends on the options installed, as shown here.

- **Memory Card Utilities (OPTION)**
  
  Use this to delete files or to format or copy a machine template onto the memory card. (The Utilities menus accessed by selection of this menu for the optional Memory Card are similar to those accessed for Floppy Disk shown on the following pages.)

- **Floppy Disk Utilities**

  Use this to delete files or to format or copy a machine template onto floppy disk. The examples on the following pages illustrate this selection.

- **Hard Disk Utilities (OPTION)**

  Use this to delete files or to format or copy a machine template onto hard disk. See page 19–15.

- **Virtual Disk Utilities**

  Use this to delete files or to format or copy a machine template into non-volatile virtual memory.

- **Mass Storage Preferences**

  Use this to set, add, or delete a working directory, or to customize file names. See page 19–16.

- **File Transfers (IF MORE THAN ONE MASS STORAGE DEVICE IS AVAILABLE)**

  This is for copying files from one storage device to another. See page 19–19.
These menus appear when Floppy Disk Utilities is selected from “MASS STORAGE” and a floppy disk has been newly inserted, or if there is no floppy in the drive.

(RE-)READ DRIVE

Use this to read the floppy, and to display directory contents.
Once the floppy has been read, these menus appear, displaying information on the installed storage media:
- Last “format” date and time
- Media size and available free space
- Date, time, and size information of the selected file on the media.

**TEMPLATE AND FORMATTING**

Use this to access a secondary menu for formatting storage media or copying the machine template to it. The template is an ASCII text file containing all information required to decode the descriptor part of a binary waveform.

**DO DELETE**

Use this to delete the file selected in the “File” menu.

**File**

By means of the associated menu knob or buttons, this is for selecting the file to be deleted.
These menus appear when “TEMPLATE AND FORMATTING” is selected from “FLPY UTIL.”

PERFORM FLPY FORMAT

Use this to format the floppy in DOS format with an interleave factor of two, which optimizes throughput to and from the instrument.

Density

This menu appears only in “FORMAT FLOPPY.” For selecting density — 1.44 MB (HD) or 720 kB (DD).

COPY TEMPLATE TO

This is for copying the machine template to the medium. The machine template is an ASCII text file containing all the information required to decode the descriptor part of a binary waveform.
These menus appear when "MASS STORAGE," "Hard Disk Utilities," "TEMPLATE AND FORMATTING" is selected and the optional hard disk drive is connected.

**QUICK FORMAT**
Use this to quickly (15 seconds) clear the portable hard disk drive.

**FULL FORMAT**
Use this to completely format the HDD — recommended if the disk is unreadable.

**COPY TEMPLATE TO**
This is for copying the machine template to the medium. The machine template is an ASCII text file containing all the information required to decode the descriptor part of a binary waveform.
These menus appear when “MASS STORAGE,” “Mass Storage Preferences” is selected and are used for:
- Selecting the working directory
- Deleting a directory
- Accessing the “File Name Preferences” menu
- Accessing the “Add New Directory” menu

**on drive**

This is for selecting the medium.

**File Name Preferences**

Use this to access the secondary menu for defining custom names for waveform, setup, or hard copy files (see next page).

**DELETE THIS DIRECTORY**

Use this to delete the directory selected in the *work with* menu.

**work with**

This is for selecting the directory to be used for file storage and retrieval.

**Add new Directory**

Use this to access the secondary menu for adding a new directory.
FILENAME PREF

This menu group appears when “File Name Preferences” is selected from the preceding menu. It is used to define custom names for waveform, setup, or hard copy files.

to be set to:

Use this to select the character for modification.

RESTORE DEFAULT NAME

This is for restoring the file type selected in the “File Type” menu to its default name.

ENTER NEW FILE NAME

Use this to validate the newly defined name.

BACKSPACE

This is for moving back one space and erasing the previous character.

INSERT

Use this to move forward to create a space for insertion of a character.

character

This is for selecting a character by means of the menu knob.

File Type

Use this to select the file type for customizing.
This is used to define a new directory with a custom name.

**New Directory on Card:**
This is for selecting the character to be modified.

**MAKE THIS DIRECTORY**
This is for validating the new directory.

**BACKSPACE**
Use this to move back one space and erase the previous character.

**INSERT**
This is for moving forward to create a space for the insertion of a character.

**character**
This is for selecting a character by means of the menu knob.
These menus appear when "MASS STORAGE," "File Transfers" is selected. They are used to copy files from one medium to another.

**Direction (DEPENDING ON OPTIONS INSTALLED)**

Use this to select a source (copy from) and destination (copy to).

**Which files**

This is used to select the type of file for copying.

**DO COPY**

Use this to execute the copying.
Special Modes

When “Special Modes” is selected from UTILITIES, these menus become available (not all selections may be available).

**Timebase Trigger Accesses:**
- **AUTO sequence**
  This is for specifying the time-out in Sequence mode, using the associated menu knob to change the value.

**Channels Accesses:**
- **On GAIN Changes, all OFFSETS fixed**
  This is for specifying the offset behavior of a gain (VOLTS/DIV) change. The offset can be fixed either in **Volts** or vertical **Divisions**.
- **Automatic Recalibration**
  This is for turning the automatic recalibration **ON** or **OFF**. The default setting is **ON**. Turning this off may speed up the acquisition, but during that time, calibration is not guaranteed.
- **Global BWL**
  Use this to turn on control of the Global Bandwidth Limit. When **On**, the chosen bandwidth limit applies to all channels; when **Off**, a bandwidth limit can be set individually for each channel. See Chapter 10, “Coupling.”

**Cursors Measure Accesses:**
- **Read time cursor amplitudes**
  This is for selecting the time cursor amplitude units in **Volts** or **dBm** from the “In” menu.

**Remote Ctrl. Assistant**
This accesses the “RC ASSISTANT” menus (see next page)

**Front Panel**
This accesses the “USER PREF’S” menu group (see page 19–22).

**Firmware Update**
This accesses the “FLASH UPDATE” menu (see page 19–23).
RC ASSISTANT

Used for monitoring remote commands received through the GPIB and RS-232 remote control ports, the Remote Control Assistant helps debug communications between the DDA and the PC. When activated, it displays a log of the dialog taking place through the remote control ports of the DDA. When a communication error occurs, RC Assistant gives the additional message “Remote Control: problem detected and logged.”

**Log**

Use this to select:

- **Off** means that the RC Assistant will not capture any remote commands.
- **Errors Only** displays only wrong or incomplete commands received through any remote control port (default after power on).
- **Full Dialog** captures all remote commands received through any remote control port, and displays up to 100 lines of dialog, after which lines are overwritten on a first-in-first-out basis.
- **Log & RS232** logs the full dialog and sends it to a recording device connected to the RS-232 port. When this is used, commands can only be received through the GPIB port.

See also the commands COMM_HELP and COMM_HELP_LOG in the Remote Control Manual.

**Turn to**

Turning the knob associated with this menu enables you to scroll through the log. Pushing the corresponding menu button clears the log entirely.
This enables the general behavior of front panel controls to be customized in accordance with user preferences.

### Pushbutton

#### auto-repeat

If **On**, all front panel buttons when held down will cause their respective menus to automatically and sequentially scroll through all their choices.

### Audible feedback

#### for buttons

When **On**, an audible beep will sound when you press any front panel button.

#### for Knobs

When **On**, an audible beep will sound when you turn any front panel knob.
FLASH UPDATE

These menus allow updating of the DDA with new software. Shown here is the full screen warning message displayed when “FLASH UPDATE” has been selected from “SPECIAL MODES.” The second menu is called “Update Flash” on the DDA-260.

Warning:
Reprogramming the flash memory is a procedure to be performed with care.

Any loss of power during the update process could cause the scope to require Factory service.

The update process requires a LeCroy supplied software update memory card or floppy disk. This contains the necessary information to update your scope software.

Note that once software has been updated it is not possible to revert to the previous software version.
CAL BNC Setup

When “CAL BNC Setup” is selected from UTILITIES, a choice can be made of the type of signal put out at the CAL BNC connector. The frequency, amplitude and pulse shape of the calibration signal can also be chosen.

In addition, the CAL BNC connector can be used to provide a pulse:
- as an action for PASS/FAIL testing
- at the occurrence of each accepted trigger event (Trigger Out)
- when the DDA is ready to accept a trigger event (Trigger Rdy)

Moreover, a DC level in the range 0.05 V to 1 V into 1 MΩ can be selected.

When the instrument is switched on, the calibration signal is automatically set to its default state: a 1 kHz, 1 V square wave.

**mode**

Use this to select the type of signal.

**SET TO**

Use this to reset the CAL BNC output to its default state.

**Shape**

Use this to select the form of the calibration signal.

**Amplitude**

Using the associated knob, this is to set the desired high level for all CAL BNC applications. If the BNC output is connected to an input channel with 50 Ω, the amplitude will be halved.

**Frequency**

Using the associated knob, this is for setting the desired frequency of a CAL signal in the range 500 Hz to 2 MHz.

§ § §