



Operator's Manual
SD385 NOMAD Portable
Signal Analyzer
Part Nine
Legacy Manual

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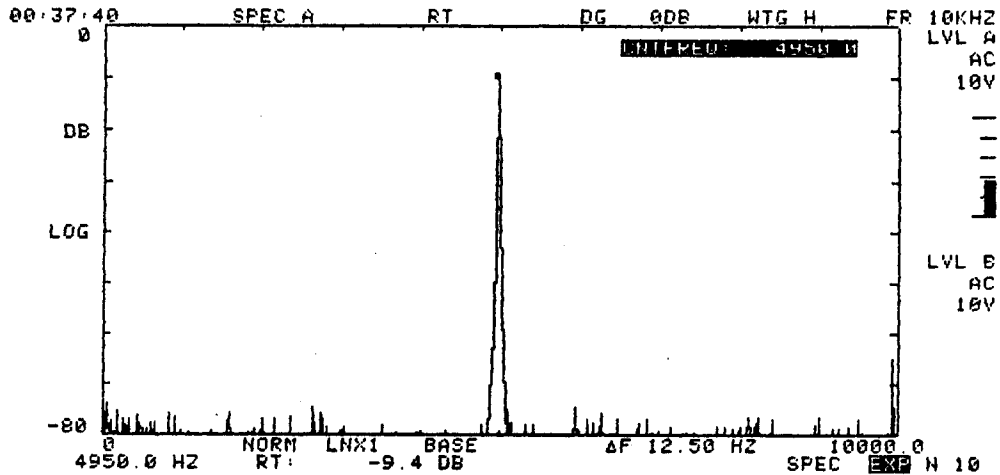


Figure 3-FRNT-17. CF Button Display Example

AVG # Button

The AVG # button allows the operator to enter the number of ensembles to averaged (AVG N) or the average time duration (AVG T) in seconds. This is accomplished as follows:

Press the AVG # button. A numerical entry Control Field will appear in the upper right corner of the display grid as shown in Figure 3-FRNT-18. There will already be a numerical value present. This value is the last value entered by the operator or the instrument default value (10). New values can be entered using the numbered buttons on the keypad and then pressing the ENT button. Existing numerical values can be cleared or recalled using the CLR and RCL buttons while the AVG # Control Field is on the display.

The example shown in Figure 3-FRNT-18 says "AVG N" indicating that Average Target Count (number of ensembles to be averaged) is selected. Values from 1 to 999 can be entered for AVG N. If Average Target Time (Average Time in seconds) is selected, the AVG # Control Field will say "AVG T." Values from 1 to 2000 can be entered for AVG T. Selection between AVG N and AVG T can be accomplished using the "AVERAGE TARGET COUNT" and "AVERAGE TARGET TIME" numerical entry Control Field located on Setup Page 1 or by direct access via the Control Field and Control Menu shown in Figure 3-FRNT-19.

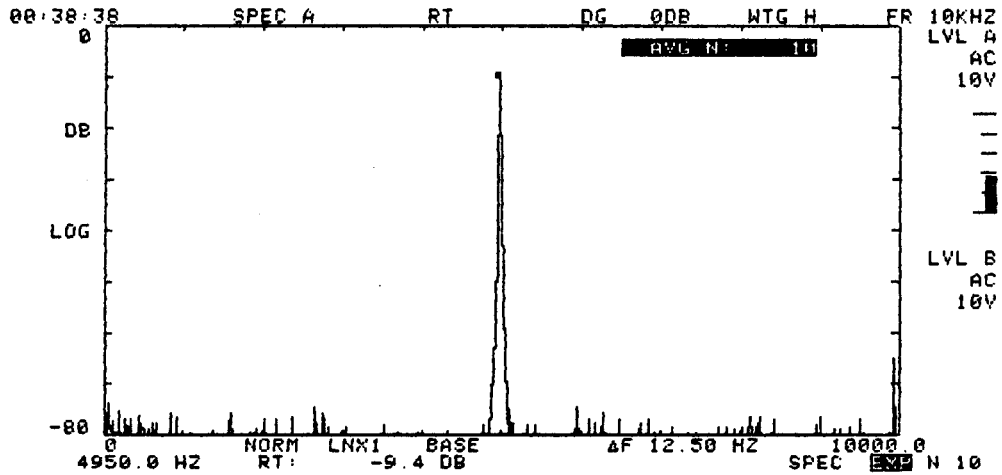


Figure 3-FRNT-18. AVG # Button Display Example

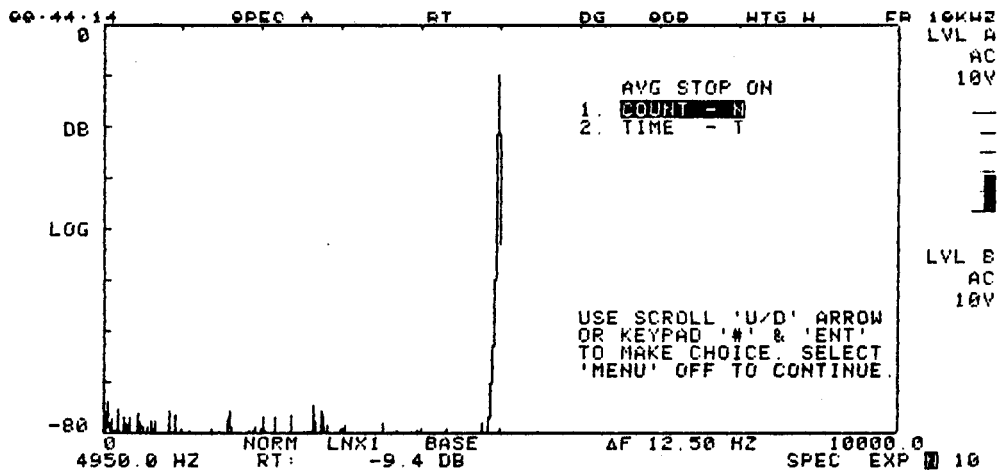


Figure 3-FRNT-19. AVG STOP ON Control Menu

% TH Button

The % TH button is used to enter a specific threshold percentage for triggering Input Memory acquisition in the Single (SINGLE(AMP) TRIG) and Repeat (REPEAT(AMP) TRIG) Internal Trigger Modes. The UPDATE MODE Control Menu is the first Control Menu located on Setup Page 1. This Control Menu (UPDATE MODE) is one of the few controls that can only be accessed by entering the Setup Page Mode.

Entering a threshold percentage is accomplished as follows:

Press the %TH button. A numerical entry parameter will appear in the upper right corner of the display grid as shown in Figure 3-FRNT-20. There will already be a numerical value present. This value is the last value entered by the operator or the instrument default value (10). New values can be entered using the numbered buttons on the keypad and then pressing the ENT button. Existing numerical values can be cleared or recalled using the CLR and RCL buttons while the %TH Control Field is on the display.

The percentage entered should be + or - percentage of full scale display voltage with no Y axis gain. For example, a TH % of 50 would trigger on 0.5 V on the 1 Volt Input Level. Negative values are entered by pressing the +/- button after the numerical value is selected.

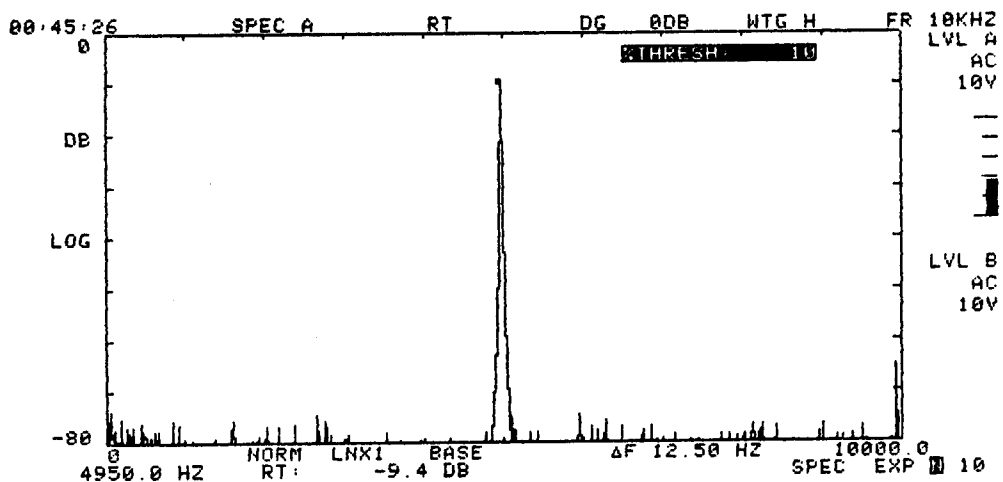


Figure 3-FRNT-20. %TH Button Display Example

FILE Button

The FILE button is part of the Data Storage Option and is used when creating, storing and recalling disk files. A description of the use of this button is included with the operational procedures for the Data Storage Option on Setup Page 9.

TIME Button

The TIME button is for entering the time-of-day. To do this, press the TIME button, then select the time of day (24 hour clock) on the numbered keypad using the following format: HH.MM where HH is hours and MM is minutes. Be sure to include the decimal point between the hours and minutes. Next, press the ENT button. The entered time of day will appear at the left end of the top line of display annotation.

RCL, CLR & ENT Buttons

The RCL (Recall), CLR (Clear) and ENT (Enter) buttons are used to recall, clear and enter values for all the numerical entry parameters located on the Setup Pages or accessed by the front panel buttons, and the Text Entry feature. These buttons are described in conjunction with the functions and parameters that require their use.

Numbered Buttons

The numbered buttons are used with any parameter that requires a numerical value to be assigned. In addition, these buttons are used as the "numbers" for the Text Entry feature.

The FILE button is part of the Data Storage System and is used when clearing, storing and recalling data. The use of this button is described in the Data Storage System Manual.

The FILE button is used to clear the memory of the system. It is used when the system is to be used for a new set of data. The use of this button is described in the Data Storage System Manual.

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WATERFALL GROUP

3-3.10.5 Operation of the WATERFALL Group



This group of buttons is used to enable/disable the Waterfall feature, Load the Waterfall File, place the Waterfall Memory in Hold, and Clear a Waterfall File.

HOLD Button

The LOAD button initiates loading of analyzer trace data into the selected Waterfall File. Loading of the selected Waterfall File can be initiated with the Waterfall feature either enabled or disabled, as long as a valid analyzer function is selected and a single trace display is selected. Functions that are valid for loading data into the Waterfall are indicated in the last column on Tables 3-4 through 3-9 located with the description of Setup Page 3. Updating of the selected Waterfall File will take place in accordance with the selected Waterfall Update Mode. The Waterfall UPDATE MODE menu is located on Setup Page 6.

Anytime a change is made that is not compatible with the data contained in the current Waterfall File, the Waterfall File will stop updating, the LED on the LOAD button will go out and the following message will appear at the top of the display: "CHANGE TO ANALYZER SETUP ERASE FILE AND RE-UPDATE." This means you can return the analyzer to the original setup or erase the current File contents and, in both cases, re-initialize the loading process.

HOLD Button

The HOLD button places the selected Waterfall File in Hold and stops the Waterfall update process.

CLEAR Button

The CLEAR button erases the selected Waterfall file. This button must be pressed twice to clear the selected file.

DISP ON/OFF Button

The DISP ON/OFF button toggles between the Waterfall display and the standard analyzer display. The Waterfall feature can be enabled at any time. However, as previously stated, a valid analyzer function and a single trace display must be selected before the Waterfall can acquire data.

Figure 3-FRNT-21 is an example of a Waterfall Display.

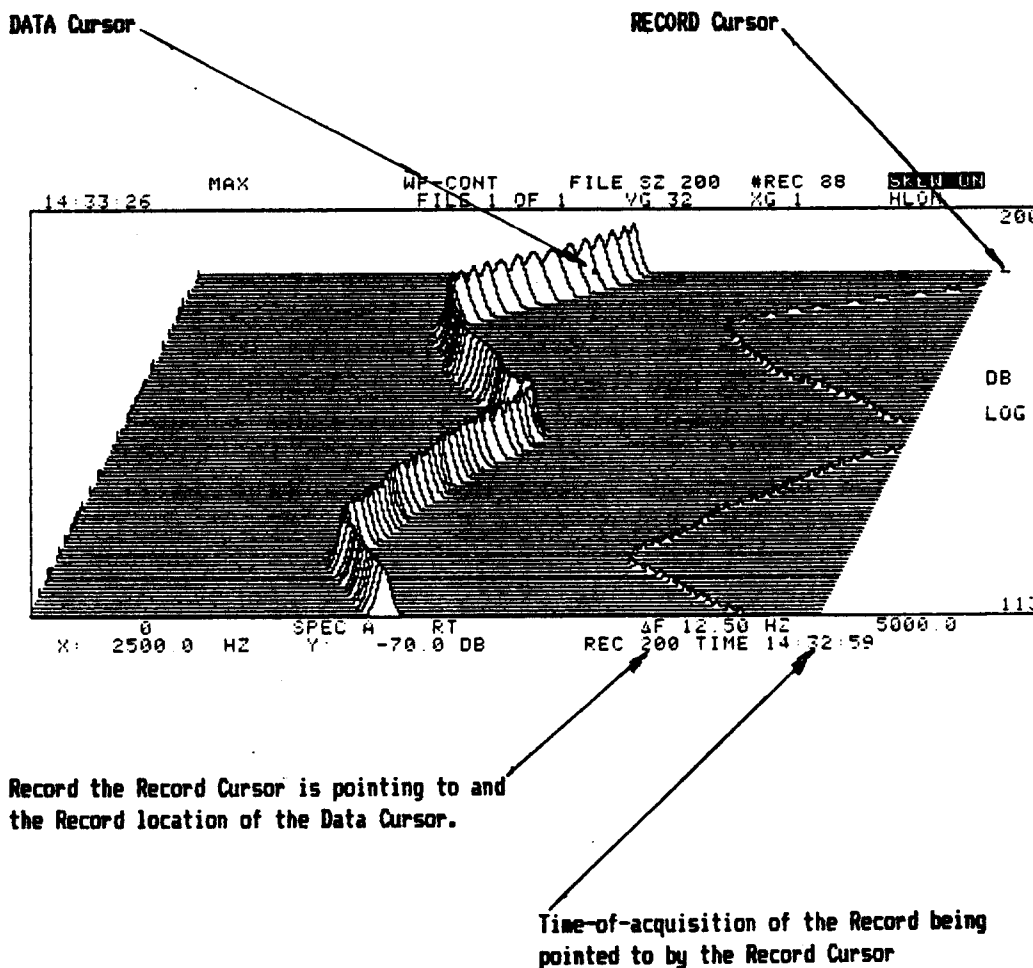


Figure 3-FRNT-21. Waterfall Display Example

**FIELD LOCATOR
GROUP**

3-3.10.6 Field Locator Group

FIELD LOCATORS



These buttons, when pressed, place the RV directly on the controls indicated in Figure 3-FRNT-22. These buttons are a convenience feature that allows you to access frequently-used Control Fields without excessive manipulation of the SETUP group directional buttons. In addition, the Control Fields that these buttons access have been strategically located to allow you to "ballpark" the RV close to other Control Fields you may wish to access. Specifically, you can: change a Function within a Function Group (FUNC), change the Display Memory (MEM), change the Frequency Range (FREQ), change the Y axis units (Y UNITS) and change the Average Data (AVG). When one of these buttons is pressed, the RV will move to the Control Field that corresponds to the selected FIELD LOCATOR button. Changes can now be made to the selected control field using the SCROLL group directional buttons.

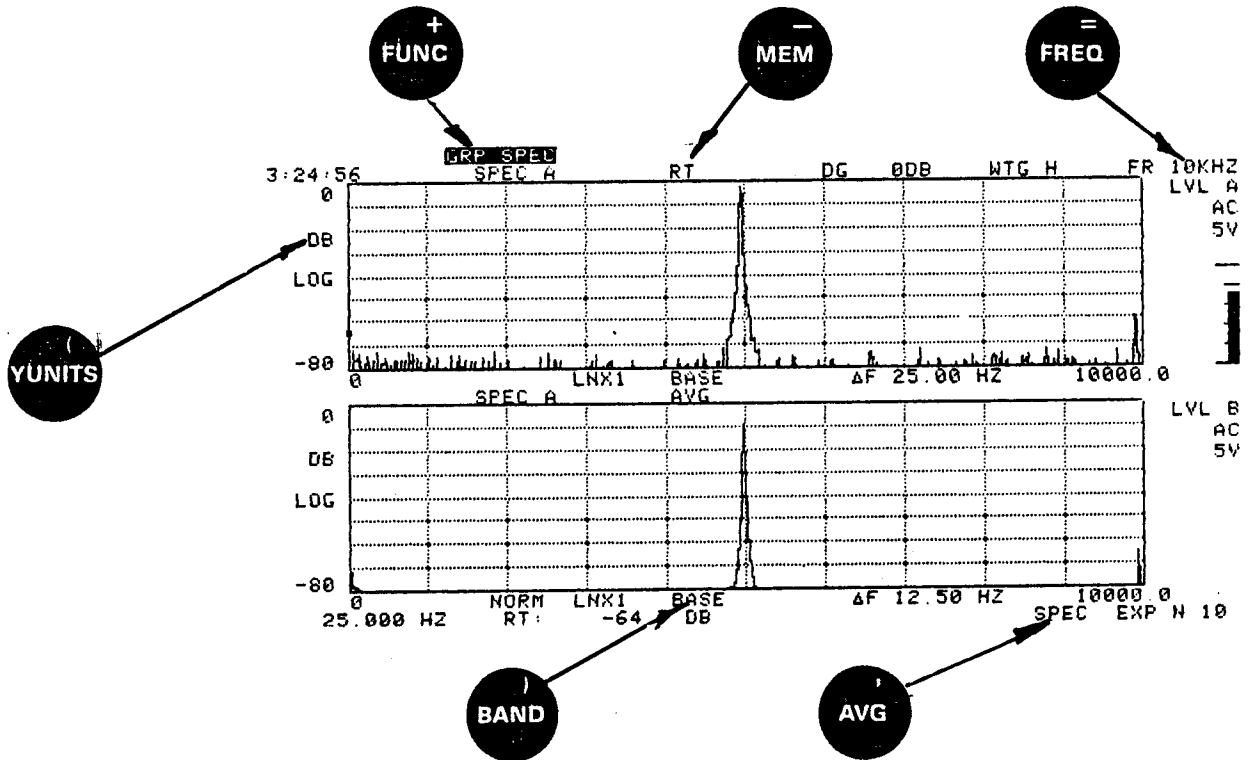
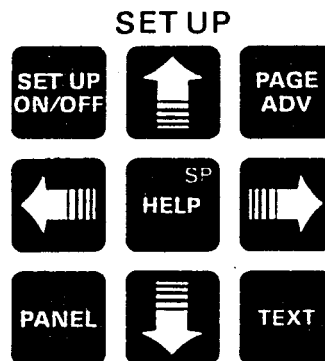


Figure 3-FRNT-22. Control Fields Accessible by the FIELD LOCATOR Buttons

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SETUP GROUP

3-3.10.7 Operation of the SETUP Group



This group of buttons is used to enter/exit the Setup Page Mode, step through the Setup Pages, make selections within a Setup Page, enable/disable the Help feature, enable/disable the Panel Store mode and enable/disable the Text Entry Mode.

SETUP ON/OFF Button

If a data display is on the screen, pressing the SETUP ON/OFF button will cause either the Setup Page Listing or a Setup Page to appear on the display. This condition depends upon what was being displayed (a Setup Page or the Listing) when the Setup Mode was last exited.

PAGE ADV Button

The PAGE ADV button is used to step through the Setup Pages.

UP/DOWN/LEFT/RIGHT Directional Buttons

These buttons control movement of the RV from one control field to another on the data display. When a setup page is on the display, these buttons control movement of the RV from one control menu to another or, when the Setup Page Listing is on the display these buttons can be used to move the RV from one selection to another. In addition, these buttons control movement of the TEXT cursor when the TEXT ENTRY feature is enabled.

HELP Button

The HELP button, when pressed, enables the HELP feature. HELP is a built-in quick reference feature that allows the user to access over 100 messages containing information for all the front-panel buttons and control fields. When the HELP button is first pressed, the following message will appear on the display:

```
HELP
INFORMATION FOR A FRONT PANEL BUTTON, OR A CONTROL
FIELD IS OBTAINED AS FOLLOWS:
HELP FOR A BUTTON:  PRESS THE BUTTON(S) FOR WHICH
                    "HELP" IS DESIRED.
HELP FOR CONTROL FIELDS:  MOVE THE REVERSE-VIDEO
                           FIELD SELECTOR TO THE FIELD FOR
                           WHICH "HELP" IS DESIRED USING THE
                           SETUP UP/DN/LF/RT ARROWS OR THE
                           FIELD LOCATOR KEYS.
EXIT HELP:  PRESS HELP TO RESTORE NORMAL OPERATION.
SELF TEST:  INITIATES ANALYZER "SELF TEST" FUNCTION.
SYS RESET:  INITIALIZES THE ANALYZER AND ERASES ALL
            DATA MEMORIES.
```

This is how the feature works:

Help messages for the control fields that surround the display can be accessed by first pressing the HELP button, then moving the RV to the desired control field using either the SETUP group directional buttons or the FIELD LOCATOR group buttons. Pressing any other button (except HELP, SELF TEST or SYS RESET) while HELP is enabled will cause a HELP message for that button or group of buttons to appear on the display.

Descriptions of the SELF TEST and SYS RESET buttons are included with the introductory HELP message because pressing either of these buttons will cause the instrument to perform the described function regardless of the instrument mode.

PANEL Button

The PANEL button is used by the operator to store and recall complete analyzer configurations. There are seven panels available, six for storage and recall, the seventh a reference (factory) ROM based configuration that allows recall only.

The reference configuration is called "Panel Zero Recall" and can be obtained by pressing the following sequence of buttons: First, press the PANEL button. Next, on the ENTRY keypad, press the button with the number 0, and then press the RCL button. The display configuration as shown in Figure 3-FRNT-23 will appear. Note that the "Panel Zero Recall" configuration example shown in Figure 3-FRNT-23 reflects no data in either the Input Memory or the Averager Memory. If an input signal is present, there will be data in the upper display. If an average has been performed there will be data in the lower display as well, as long as the averaged data is compatible with the "Panel Zero Recall" display configuration. If not, a message will appear on the right half of the display indicating the incompatible settings.

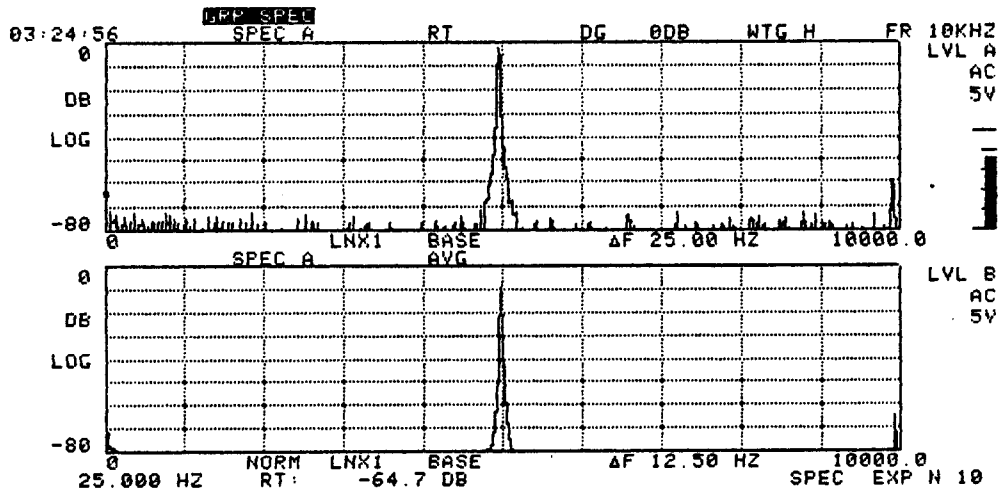


Figure 3-FRNT-23. "Panel Zero Recall" Display Configuration

The panels available to the operator, for storing and recalling specific analyzer configurations, are panels 1 through 6.

To STORE a display configuration, do this:

- * Press the PANEL button.
- * Assign a number (from 1 to 6) to the selected display configuration using the numbered buttons on the keypad.
- * Press the ENT button. That's it.

To RECALL a display configuration, do this:

- * Press the PANEL button.
- * Press the numbered button that corresponds to the display configuration you want to recall.
- * Press the RCL button.

Once RCL is pressed, the statement "CONFIG IN EXECUTION" will appear, momentarily, in the upper left corner of the display and the display will assume the stored configuration. This statement will be preceded by several dashes. These dashes take the place of what could be a panel ID assigned to each stored configuration.

To assign an ID to a stored configuration, do this:

- * Press the PANEL button.
- * Press the CURSOR group LIST button.

A list as shown in Figure 3-FRNT-24 will appear on the display.

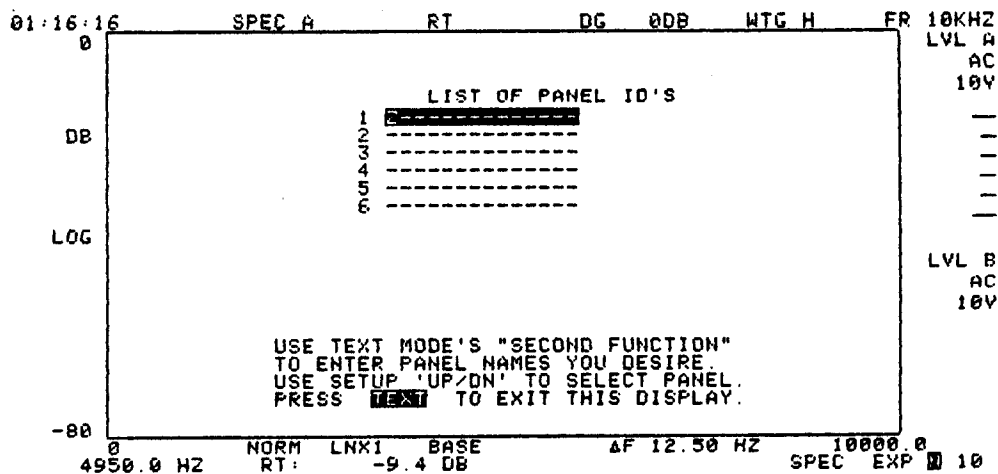


Figure 3-FRNT-24. PANEL ID LIST Example

When this list is on the display, the Text Entry feature is automatically enabled. However, in this mode, Text Entry is limited to the list. Up to 14 characters can be entered on each of the six lines. This is accomplished using the front-panel buttons with the little letters/symbols located in the upper right-hand corner. Numbers are assigned using the numbered buttons on the ENTRY keypad. Spaces are assigned using the SETUP group LEFT/RIGHT directional buttons. The LIST is exited by pressing the SCROLL group SEL TRACE button.

Now, when a display configuration is recalled, the "CONFIG IN EXECUTION" statement will be preceded by the assigned ID.

Stored display configurations cannot be cleared. However, they can be "written over" by storing another display configuration using a duplicate number.

There is a STATIC, battery-maintained RAM where all of these display configurations are stored. Storage duration, with power removed, is approximately ten days.

TEXT Button

If you look at the front panel buttons, you will notice that some of the buttons have small letters and symbols located in the upper right-hand corner. These buttons are the dual-function buttons used with the Text Entry feature. In addition, all the ENTRY keypad numbered buttons, the slash between the plus and minus and the RCL and CLR buttons are used for Text Entry.

Additional Text Entry characters exist that are not available via the front-panel buttons. These characters can only be accessed via the IEEE data bus and include the following: Δ (Delta), ϕ (Phase), $^{\circ}$ (Degree), σ (Sigma), $||$ (Absolute bars), $\sqrt{\quad}$ (Square root) and 2 (Exponential 2). For additional information on these characters, refer to the Text Entry description contained in the Control Operations section of Appendix A, IEEE Interface.

This is how the feature works:

When the TEXT button is pressed, the LED in the upper left-hand corner of the button will light, standard front-panel operation will be locked out and the Text Entry Cursor will appear in the upper left-hand corner of the display grid. The Text Entry Cursor consists of a high-lighted square root symbol.

User-entered text can now be placed anywhere within the confines of the display grid. If multiple grids are being displayed, text cannot be entered between the display grids that have instrument-generated annotation located between the grids. The Text Entry Cursor will be blanked as it passes from one grid to another.

The SETUP group directional buttons are used to control movement of the Text Entry Cursor. The UP/DOWN directional buttons control vertical movement and the LEFT/RIGHT directional buttons control horizontal movement. When one of the UP/DOWN directional buttons is pressed, the Text Entry Cursor will move, vertically, from one line to another. When the upper or lower edge of the display grid is encountered, "wraparound" will occur; i.e., if the Text Entry Cursor is at the top of the display grid, pressing the SCROLL group UP arrow will cause the Text Entry Cursor to appear at the bottom of the display grid and vice-versa. When one of the LEFT/RIGHT directional buttons is pressed, the Text Entry Cursor will move one character space, in the indicated

Cursor will move one character space, in the indicated direction, each time the button is pressed. Wraparound also occurs when the Text Entry Cursor is moved in a horizontal direction, except the Text Entry Cursor line position will increase or decrease depending upon the directional button pressed (left or right); i.e., if the Text Entry Cursor is at the right edge of the display grid and the line position is, for example, line three, pressing the RIGHT arrow will cause the Text Entry cursor to appear at the left edge of the display grid on line four (there are 20 total lines available for Text Entry). The same is true for the other direction except the Text Entry Cursor would go from line three to line two.

When one of the character buttons is pressed, the selected character will appear in place of the Text Entry Cursor and the Cursor will move one character space to the right.

Pressing the CLR button erases all Text Entry characters located to the right of the Text Entry Cursor. However, if the CLR button is pressed just once, the erased text can be recalled and placed at another position using the Text Entry Cursor. Here's how:

Place the Text Entry Cursor to the immediate left of the text you want to move. Press the ENTRY group CLR button. Move the Text Entry Cursor to the desired area. Press the RCL button. The text will appear to the right of the Text Entry Cursor.

In this manner, blocks of text may be duplicated and moved to various parts of the display.

Pressing the ENTRY group CLR button twice will permanently remove all entered text located to the right of the Text Entry Cursor.

Pressing the ENTRY group CLR button immediately upon entering the Text Mode will erase all user-entered text permanently. If the Text Mode is already enabled, toggle the TEXT button (turn it off, then on), then press CLR.

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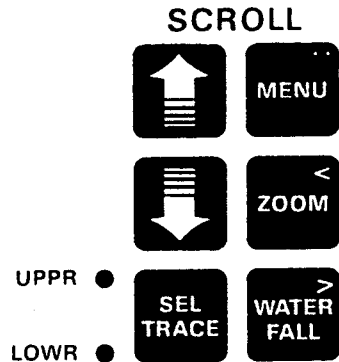
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SCROLL GROUP

3-3.10.8 Operation of the SCROLL Group



This group of buttons is used to turn specific menus on and off, make selections within a menu, increase and decrease the ZOOM multiplier, scroll the Waterfall Records, and select the trace or traces for display

UP/DOWN Buttons

The UP/DOWN buttons are used to control operation of the functions enabled by the three buttons located just to the right of these buttons (MENU, ZOOM, WATERFALL). If the LED on the MENU button is lit, then these buttons are used to make menu selections. If the LED on the ZOOM button is lit, these buttons are used to increase/decrease the ZOOM multiplier. If the LED on the WATERFALL button is lit, these buttons are used to scroll through the displayed Waterfall File.

MENU Button

The MENU button is used to enable/disable the Control Field or Control Menu indicated by the position of the RV, or when the SETUP function is enabled, pressing the MENU button allows you to toggle between the Setup Page Listing and a specific Setup Page. These conditions are described as follows:

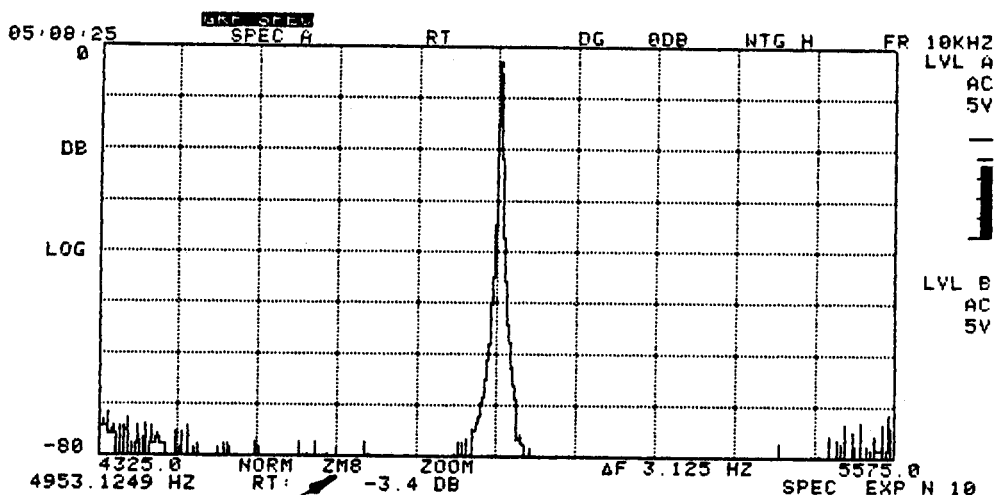
If a data display is on the screen, pressing the MENU button will cause the right side of the data display to be blanked and a Control Field/Menu to appear. The Control/Field Menu that appears depends upon the location of the RV. When the RV

is moved, with a Control Field/Menu on the display, the Control Field/Menu will change each time the RV is moved, and will display the Control Field/Menu that corresponds to the location of the RV. Selection within a Control Menu is accomplished using the SCROLL group UP/DOWN buttons. Control Fields require a numerical value to be entered via the ENTRY keypad. However, a Control Menu does not have to be displayed for selection to take place. Simply placing the RV on a control and then pressing the SCROLL group directional buttons in the desired direction will affect a Control Menu change.

If the Setup Page Listing or a Setup Page is on the display, pressing the MENU button will toggle the display between the Setup Page Listing and the Setup Page selected on the Listing. Specifically, there is an RV located on the Setup Page Listing that indicates the Setup Page that will be displayed when the MENU button is pressed. Selection on the Setup Page Listing (when it is being displayed) is accomplished using the SCROLL group UP/DOWN directional buttons.

ZOOM Button

When the selected Analysis Band is ZOOM, there are two other control settings that interact with this Analysis Band selection. These are: Zoom Center Frequency and the Zoom Multiplier. All three of these menus (ANALYSIS BAND, ZOOM MULTIPLIER and ZOOM CENTER FREQ.) are located on Setup Page 2. However, only the ANALYSIS BAND menu can be displayed without accessing Setup Page 2. The other two settings (Zoom Center Frequency and Zoom Multiplier) can be controlled via front-panel buttons. Zoom Center Frequency is controlled by the CF button located on the ENTRY group keypad. Operation of this button is included with the description of the ENTRY group keypad. When the SCROLL group ZOOM button is pressed, the LED on the ZOOM button will light and the LED on the MENU button will go out indicating that the MENU button is now disabled. The SCROLL group UP/DOWN directional buttons are now used to control the Zoom Multiplier setting. In addition, the Zoom Multiplier setting can be increased, one step, each time the SETUP button is pressed. The Zoom Multiplier display indication is shown in Figure 3-FRNT-26. To exit Zoom Multiplier control, press the ZOOM button again. The LED on the ZOOM button will go out and the LED on the MENU button will light.



**ZOOM MULTIPLIER
DISPLAY INDICATION**

Figure 3-FRNT-25. Zoom Multiplier Display Indication

WATERFALL Button

The WATERFALL button can be enabled only when the Waterfall feature is enabled. When the Waterfall feature is enabled, pressing the WATERFALL button allows the displayed Waterfall Records to be scrolled up or down using the SCROLL group UP/DOWN directional buttons. The records can be scrolled up or down until the boundary of the displayed file is reached. When this happens the statement "AT LIMIT" will appear in the upper left corner of the display. This feature can be used only when the Waterfall Memory is placed in Hold by pressing the WATERFALL group HOLD button. This feature also allows you to display waterfall records that are not part of the current waterfall display.

SEL TRACE Button and the UPPR/LOWR LED's

When the selected display function is a dual trace type function (e.g., SPECTRUM RT & AVG, RT & STO, etc.) the SEL TRACE button is used to select either or both traces for display. The LED's located just to the left of the button give a visual indication as to which trace is being displayed.

DISK/ I/O GROUP

3-3.10.9 Operation of the DISK I/O Group



This group of buttons is used to turn the Data Storage Option on and off, operate an HP "Thinkjet" Printer and to initiate/abort the Digital Plotter function.

DISK Button

The DISK button is used to enable the Data Storage Option.

Data Storage Operation

To format a disk:

Press the DISK I/O group DISK button. On the ENTRY keypad, press CLR. The statement "PRESS ENT TO FORMAT DISK, CLR TO ABORT" will appear at the top of the display. Press the ENT button. The previously described statement will be replaced with the following statement:

FORMATTING DISK PLEASE WAIT

New disks must be formatted in this manner before they can be used in the SD385. Formatting a disk containing previously stored data will erase the data making all the disk space available.

To store a file:

On the ENTRY keypad, press FILE then ENT. A blank, reverse video field will appear just inside the upper right corner of the display grid. In addition, the following prompt will appear at the top of the display:

FILE STORE ENTER NAME, PRESS ENT TO STORE, CLR TO ABORT

A filename of up to 24 characters can be entered using the front-panel Text Entry buttons (the Text Entry feature is enabled for this purpose). After selecting a filename, press the ENT button. The next available file will be created and filled with data as selected via the FILE TYPE menu.

To recall a file:

On the ENTRY keypad, press FILE then RCL. The statement "FILE RECALL" will appear at the top of the display, and a prompt will appear just inside the upper right corner of the display grid as follows:

FILE #:

Using the numbered keys on the ENTRY keypad, select the desired file number, then press the ENT button. The selected file will be recalled.

To delete a file:

On the ENTRY keypad, press FILE then CLR. The statement "FILE ERASE" will appear at the top of the display, and a prompt will appear just inside the upper right corner of the display grid as follows:

FILE #:

Using the numbered keys on the ENTRY keypad, select the desired file number, then press the ENT button. The selected file will be deleted. However, no disk space will be recovered, and the file number will not be available for use again. The only real effect is to make the data inaccessible.

To check the contents of a disk:

Press the DISK I/O group DISK button, then press the CURSOR group LIST button. A disk directory list will appear on the display showing each file number and the text that was entered when the file was stored.

PRINT Button

Pressing the PRINT button will initiate the printing function when an HP "Thinkjet" Printer is connected to the bus. Pressing the PRINT button when the printing function is in progress will result in the operation being aborted. If this button is pressed when no printer is connected to the bus (or the printer is not turned on), the "NO LISTENERS ON GPIB SYSTEM" statement will appear on the screen.

PLOT Button

Pressing the PLOT button will initiate the plotting function when a digital plotter is connected to the bus. Pressing the PLOT button when a plot is in progress will result in the plotting operation being aborted. If this button is pressed when no plotter is connected to the bus (or the plotter is not turned on), the "NO LISTENERS ON GPIB SYSTEM" statement will appear on the screen.

For either of these functions to operate as described, the SD385 must be in the TALK ONLY mode (address 31). This is accomplished by placing the Side-Panel DIP switch ADDRESS switches in the 1 position (this places the SD385 in the TALK ONLY mode when it's first turned on) or by accessing Setup Page 7, IEEE COMMUNICATION, and entering 31 for the DEVICE ADDRESS control field.

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SELF TEST AND SYSTEM RESET BUTTONS

3-3.10.10 Operation of the SELF TEST and SYS RESET Buttons



These buttons are used to initiate the Self Test feature and Reset the Instrument.

SELF TEST Button

Pressing this button initiates the Self-Test feature. The first thing that appears is the following message:

```
SELF TEST INITIATED (SEE MANUAL)
THIS DISPLAY WILL BE MAINTAINED FOR 20 SECONDS
NEXT A FRONT PANEL TEST SCREEN WILL BE
DISPLAYED, AND MAINTAINED FOR 10 SECONDS.
IF NO BUTTONS ARE PRESSED, THE TEST WILL
CONTINUE TO COMPLETION.
```

```
NOTE: SELF TEST WILL ERASE ALL MEMORIES
PRESS "SELECT TRACE" TO ABORT TEST
```

The last sentence in the preceding message (IF NO BUTTONS ARE PRESSED, THE TEST WILL CONTINUE TO COMPLETION) doesn't tell you that once a front-panel button is pressed while the "Front Panel Test Screen" is being displayed, the test is over (except for the front-panel button test). In addition, the only way to exit the "Front Panel Test Screen" is to press the SYS RESET button. Unless you want to verify operation of the front-panel buttons, don't press any buttons until self test is finished.

The "Front Panel Test Screen" that appears on the display immediately after the message allows the operator to validate operation of all the front-panel buttons (except SELF TEST and SYS RESET) and front-panel LED's.

Button validation is accomplished by pressing any one or all the front-panel buttons in any sequence. However, if the first button you press is any of the top three buttons in the CURSOR group, nothing will happen. Pressing any button other than these three will initiate the front-panel button test. Once this is accomplished, the top three CURSOR group buttons can now be tested in the same way as the others. When a front-panel button is pressed, the corresponding button on the display will be filled in by a Reverse Video Field.

LED validation is accomplished by pressing the CURSOR group RIGHT arrow. Each time the RIGHT arrow is pressed, the front-panel LED's will light, one at a time, in a left to right sequence. As each LED lights, the preceding LED will go out. This sequence will take place until the last LED has been lit. Once the last LED is lit, pressing the RIGHT arrow again will cause all the LED's to light. Pressing the RIGHT arrow one more time will cause all the LED's to go out.

When self test is finished, a list of test results will appear on the display as shown in the following example:

SELF TEST RESULTS (SEE MANUAL FOR DETAILS)

TEST #	ERROR CODE	TEST #	ERROR CODE
1.	PASS	11.	PASS
2.	PASS	12.	PASS
3.	PASS	13.	PASS
4.	PASS	14.	PASS
5.	PASS	15.	PASS
6.	PASS	16.	PASS
7.	PASS	17.	PASS
8.	PASS	18.	PASS
9.	PASS	19.	PASS
10.	PASS	20.

PRESS "SELECT TRACE" TO RESTORE SCREEN

NOTE

In order for tests 17 through 19 to pass, the analyzer must not be connected to any signal source. In order for test 19 to pass, the CH A and TACH IN BNC connectors must be jumpered together. Do not use a BNC cable for this. A bare wire such as a paper clip is recommended.

Each test number indicates that a specific test was performed on a portion of the circuitry defined by the test number. If a particular test does not pass, an error number will appear opposite the test number.

If "-----" appears opposite a test number, it means that the test was aborted due to the failure of a previous test.

If "....." appears opposite a test number, it means that no test exists for this test number.

If the word "OPTION" appears opposite a test number, it means that the test for a particular option was not performed because the option was not installed. However, if the Option is installed and the unit generates this message, then it means the Option itself has an error.

Tests Assigned to Each Test Number

1. CPU ROM Access Test
2. CPU RAM Diagnostic
3. CPU/DSP Interface Test
4. DSP RAM Diagnostic
5. DSP Bit Reverse Test
6. Video RAM Diagnostic
7. CIO Test
8. Panel RAM Test
9. Input Memory Access Test (Channel A)
10. CPU/Digital Filter Interface Test (Channel A)
11. Input Control Diagnostic (Channel A)
12. Sample Clock Test
13. Input Memory Access Test (Channel B)
14. CPU/Digital Filter Interface Test (Channel B)
15. Input Control Diagnostic (Channel B)
16. Dual Channel Input Control Diagnostic
17. Front End Test
18. Filter Test
19. SRA/TACH Test
20. Expansion Spare

Test Descriptions

1. CPU ROM Access Test

This test performs a simple checksum test on the ROM's. If a ROM or ROM's do not check, a specific LED will flash to indicate which ROM has failed.

Error Number	LED	ROM
1	MENU	U6
2	LOWR	U23
3	UPPR	U4
4	LOAD	U54
5	AUTO RANGE	U24
6	DISK/IO	U33
7	MEM FULL	U5
8	TRIG	U73

2. CPU RAM Diagnostic

A direct diagnostic on the CPU D-RAM; validates all locations and refresh.

Error Number	Problem
1	Waterfall RAM-page one failure
2	Waterfall RAM-page two failure
3	Waterfall RAM-page three failure
4	Normal space stack & scratch failure (indicated by half the front-panel LED's flashing).
5	System space stack & scratch failure (indicated by all the front-panel LED's flashing).

3. CPU/DSP Interface Test

Validates the Z8000 can properly interface with the TMS32020.

Error Number	Problem
1	CPU can't reset/hold DSP Processor
2	CPU can't read/write DSP program Memory
3	CPU can't read DSP program ROM
4	DSP Processor won't hold itself

4. DSP RAM Diagnostic

Validates all TMS32020 RAM.

Error Number	Problem
1	DSP Program RAM failure
2	DSP Data RAM failure
3	DSP Input RAM failure

5. DSP BIT REVERSE Test

Validates performance of the DSP section bit reverse hardware.

Error Number	Problem
1	100 line bit reverse failure
2	200 line bit reverse failure
3	400 line bit reverse failure
4	800 line bit reverse failure

6. Video RAM Diagnostic

Validates all locations in video RAM, write protects and refresh.

Error Number	Problem
1	Trace & character plane pattern test failure
2	Trace & character plane BLOCK FILL test failure
3	Grid plane pattern test failure
4	Grid plane BLOCK FILL test failure
5	CRT controller test failure

7. CIO Test

Validates the CIO timers and interrupt.

Error Number	Problem
1	Communication to chip failure
2	Counter 1 failure
3	Counter 2 failure
4	Counter 3 failure

8. Panel RAM Test

Validates all locations in panel recall RAM.

Error Number	Problem
1	Failure panel RAM read/write test

9. Input Memory Access Test (Channel A)

Validates Z8000 communication with Input Memory A.

Error Number	Problem
1	Lower half of RAM failed
2	Upper half of RAM failed

10. CPU/Digital Filter Interface Test (Channel A)

Validates proper communication between Z8000 and Channel A digital filter DSP processor.

Error Number	Problem
1	Input Control processor won't reset/hold
2	CPU can't read/write Input Control Program Memory
3	Input Control Program error, Program Memory
4	Input Control Program error, Mailbox Memory

11. Input Control Diagnostic (Channel A)

Validates that full input control functions are performing correctly. Includes DSP access to Channel A Input Memory, "collision," reliability, etc.

Error Number	Problem
1	Arbitration failure, lower half of Input Memory
2	Arbitration failure, upper half of Input Memory
3	Arbitration failure, Mailbox Memory

12. Sample Clock Test

Validates that a proper sample clock is getting to the input control cards as "convert complete."

Error Number	Problem
1	Channel A Input Control Sample Clock failure
2	Channel B Input Control Sample Clock failure

13. Input Memory Access Test (Channel B)

Validates Z8000 communication with Input Memory B.

Error Number	Problem
1	Lower half of RAM failed
2	Upper half of RAM failed

14. CPU/Digital Filter Interface Test (Channel B)

Validates proper communication between Z8000 and Channel B digital filter DSP processor.

Error Number	Problem
1	Input Control processor won't reset/hold
2	CPU can't read/write Input Control Program Memory
3	Input Control Program error, Program Memory
4	Input Control Program error, Mailbox Memory

15. Input Control Diagnostic (Channel B)

Validates that full input control functions are performing correctly. Includes DSP access to Channel B Input Memory, "collision," reliability, etc.

Error Number	Problem
1	Arbitration failure, lower half of Input Memory
2	Arbitration failure, upper half of Input Memory
3	Arbitration failure, Mailbox Memory

16. Dual Channel Input Control Diagnostic

Validates that Channel A and Channel B input control interfacing is performing correctly.

Error Number	Problem
1	Channel A failure
2	Channel B failure

17. Front End Test

Validates that input level control is working (e.g. front end gain) using the test signal.

Error Number	Channel A Input Level Failures
1	Signal Present Error. (One or both Input BNC's has an external input. Both BNC's must be open for proper testing.)
2	0.1 V
3	0.2 V
4	0.5 V
5	1.0 V
6	2.0 V
7	5.0 V
8	10.0 V
	Channel B Input Level Failures
9	0.1 V
10	0.2 V
11	0.5 V
12	1.0 V
13	2.0 V
14	5.0 V
15	10.0 V

18. Filter Test

This test uses the test signal to check the LPF filter section for all frequency ranges.

Error Number	Aliasing (Cutoff Frequency) Failures
2	Channel A 20kHz filter
3	Channel B 20kHz filter
4	Channel A 10kHz filter
5	Channel B 10kHz filter
6	Channel A 2.8kHz filter
7	Channel B 2.8kHz filter
8	Channel A 663 Hz filter
9	Channel B 663 Hz filter

Flatness, Phase Match and Amplitude Match Failures

10	Channel A flatness, 20kHz filter
11	Channel B flatness, 20kHz filter
12	A/B Phase match, 20kHz filter
13	A/B Amplitude match, 20kHz filter
14	Channel A flatness, 10kHz filter
15	Channel B flatness, 10kHz filter
16	A/B Phase match, 10kHz filter
17	A/B Amplitude match, 10kHz filter
18	Channel A flatness, 2.8kHz filter
19	Channel B flatness, 2.8kHz filter
20	A/B Phase match, 2.8kHz filter
21	A/B Amplitude match, 2.8kHz filter
22	Channel A flatness, 663 Hz filter
23	Channel B flatness, 663 Hz filter
24	A/B Phase match, 663 Hz filter
25	A/B Amplitude match, 663 Hz filter

19. SRA/TACH Test

Validates the SRA/TACH performance.

Error Number	Problem
1	RPM Incorrect
2	SRA Spectrum Incorrect

SYS RESET Button

The SYS RESET button, when pressed, initializes the analyzer and erases all data memories (the introductory message that appears when the instrument is first turned on will reappear on the display). This happens anytime the SYS RESET button is pressed, regardless of the instrument operating mode.

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SELF TEST/SYS RESET

SIDE PANEL

3-3.13 Side Panel Description

Figure 3-SIDE-1 is a side view of the SD385. The following paragraphs briefly describe the function of each of the side panel connectors, switches and power input components.

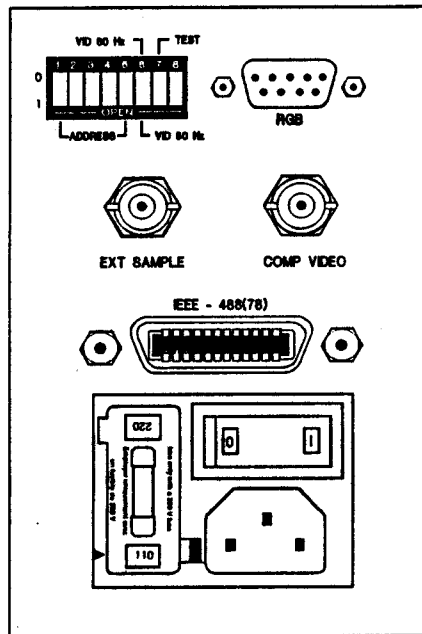


Figure 3-SIDE-1. SD385 Side Panel

POWER GROUP

FUSEHOLDER/PRIMARY POWER SELECT

Accepts a type 3AG, 5A fuse for 115Vac operation or a type 3AG, 2.5A fuse for 230Vac operation.

Fuseholder module provides selection of the primary power input for either 115 Vac or 230 Vac operation. Proper input voltage to be applied is indicated by plugging fuseholder module in so that the proper voltage can be read right-side-up (see figure 3-SIDE-2).

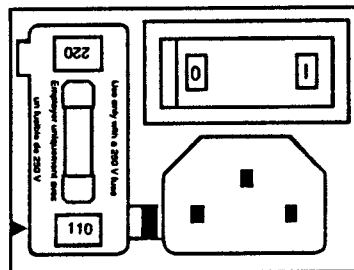


Figure 3-SIDE-2. Primary Power Module.

POWER CONNECTOR

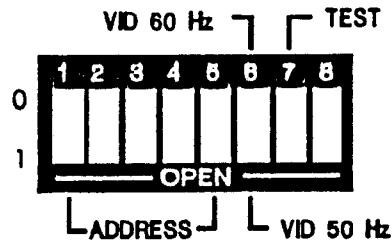
Accepts a three-wire plug and cable for applying 115/230 Vac, 47-65 Hz primary input power. Center terminal is chassis ground. Belden No. 17250 power cord is supplied for 115 Vac operation.

0/1 SWITCH (Power ON/OFF)

This rocker switch is used to turn the unit on and off. To turn the unit on, press with the "1." To turn the unit off, press the "0."

8-POSITION DIP SWITCH

Used to enable/disable the Self Test feature, select the video refresh rate (50 or 60 Hz) and assign the power-on IEEE device address to the SD385. This switch is read by the instrument when power is first applied, or when the SYS RESET button is pressed.



EXT SAMPLE BNC CONNECTOR

Accepts external sampling frequency from SD346 Signature Ratio^R Adapter (see SAMPLING SOURCE menu on ACQUISITION Page, menu SELECTION 1, EXT - SD346).

COMP VID BNC CONNECTOR

Provides a composite video signal for use with an external video monitor, or hardcopy printers that require a composite video input such as the SD422A or the SD424.

RGB (Color Monitor) CONNECTOR

Monochrome composite video signal and TTL RGB output for external color monitor (H & V negative sync).

IEEE - 488(78) CONNECTOR

The IEEE Connector is a 24 pin Amphenol connector that satisfies the requirements of Section 4 of IEEE Std. 488-1978. This connector provides interface capability with various IEEE devices. Refer to Table 3-SIDE-1 for pin assignments.

Table 3-SIDE-1. IEEE Connector Pin Assignments			
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DIO1	13	DIO5
2	DIO2	14	DIO6
3	DIO3	15	DIO7
4	DIO4	16	DIO8
5	EOI	17	REN
6	DAV	18	GND B
7	NRFD	19	GND B
8	NDAC	20	GND B
9	IFC	21	GND B
10	SRQ	22	GND B
11	ATN	23	GND B
12	GND B	24	GND B

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SIDE PANEL Page H