User's Manual
SD375 Dynamic Analyzer II
Part Four

Legacy Manual

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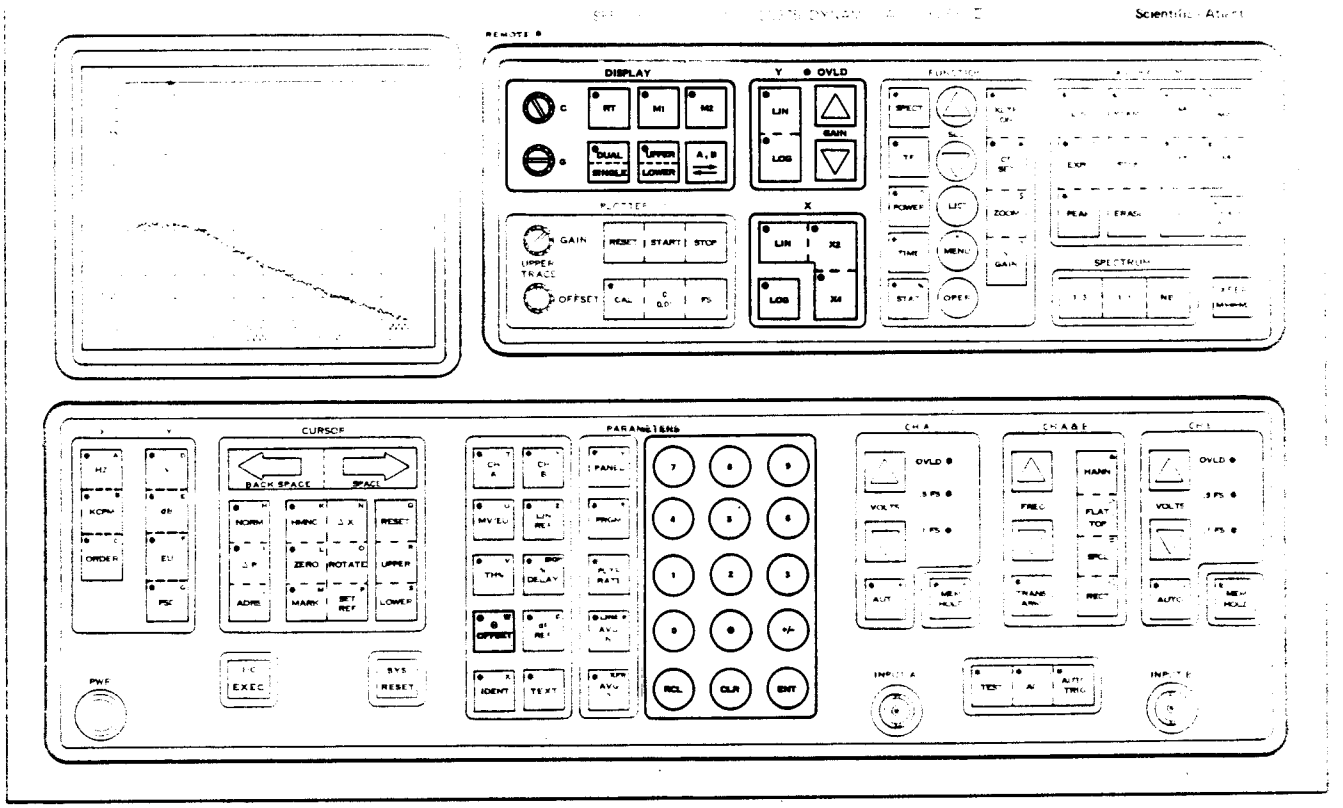
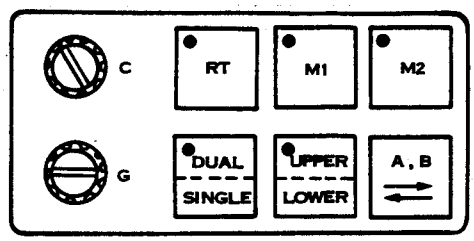
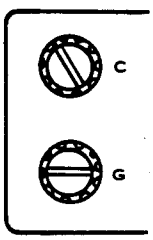
3.4.3 Control of the Display — The DISPLAY Group, the Y Axis Group, the X Axis Group, the Output OVLD LED, the θ OFFSET Touch Control and the PARAMETERS Group Keypad.



3.4.3.1 Display Selection — The DISPLAY Group





The Contrast and Grid Controls

The Contrast Control is for adjusting the intensity of the entire display (grids, annotation and trace data). The Grid Control is for adjusting the intensity of the grid only. If the Grid Control is turned all the way down (counter-clockwise), the grid will disappear completely.

The RT Touch Control

When this touch control is pressed (LED Lit), the Real Time display mode is selected. In this mode, display data is constantly being updated as it is acquired.

Not all of the primary functions can be displayed in the Real Time mode. For example, if you select Transfer Function or Power, the display will be forced to the M1 mode.

Display annotation indicating the Real Time mode is shown in Figure 3-19.

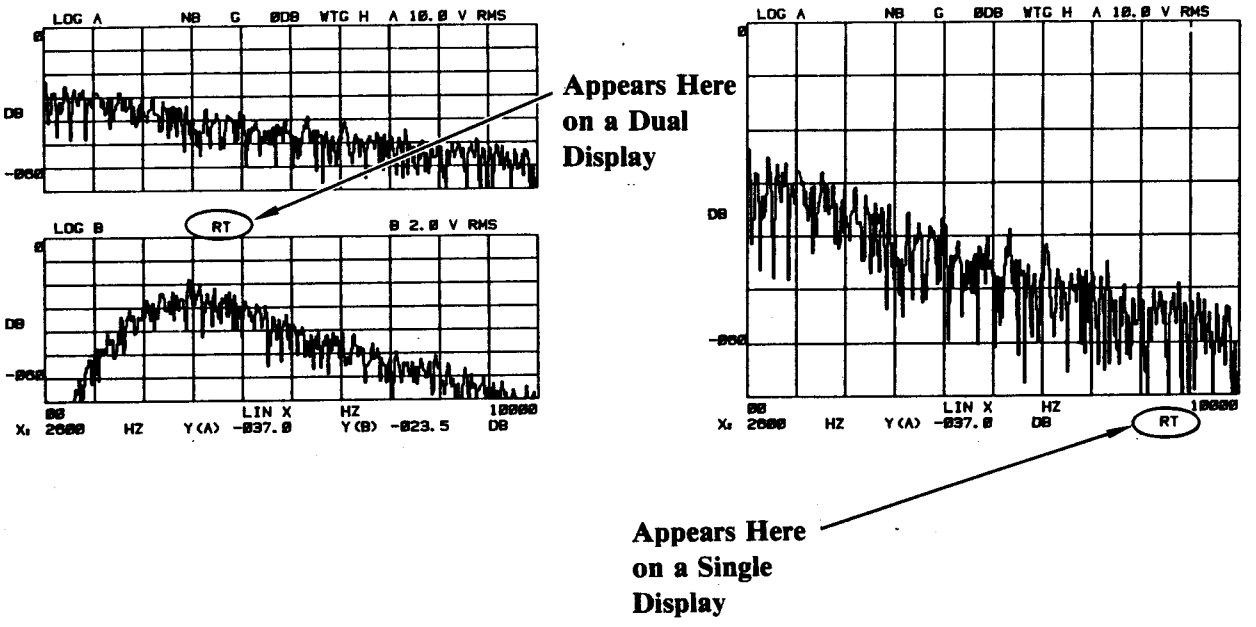


Figure 3-19. Real Time (RT) Display Annotation

The M1 Touch Control

When this touch control is pressed (LED Lit), the contents of the averager memory are displayed. Display annotation indications and instructions on the operation of the Averager Memory are located on pages 3-57 through 3-66.

The M2 Touch Control

When the touch control is pressed (LED Lit), the contents of the Storage Memory are displayed. In addition, the front panel setup that was present when the transfer from M1 (Averager Memory) to M2 (Storage Memory) was made will drive your present front-panel setup to the front-panel setup stored in M2. Additional information concerning the M2 touch control can be found on page 3-66.

The DUAL/SINGLE Touch Control

Selects either a dual or single display format. When the LED is lit, the dual display format is selected.

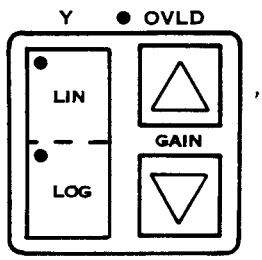
The UPPER/LOWER Touch Control

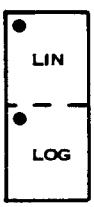
Selects the upper or lower display of a *dual* display for *single* display. When the LED is lit the upper display is selected.

The A,B Touch Control

This touch control, when pressed, interchanges Channel A data with Channel B data when performing specific mathematical functions. For example, SPECTRUM MENU selection 3, RATIO, (page 3-21) is spectrum B/A. When the interchange touch control is pressed, the display annotation and data results will become spectrum A/B. This is true for *all* Primary Function menu selections that perform mathematical calculations for the resultant display.

3.4.3.2 Y Axis Scaling and Gain — The Y Axis Group





LIN and LOG Touch Controls

These touch controls select Y Axis display-data distribution. When the LIN touch control is pressed (LED Lit), Y Axis display-data distribution is linear. When the LOG touch control is pressed (LED Lit), Y Axis display-data distribution is logarithmic. Examples of the display annotation indications for these two touch controls are shown in Figure 3-20.

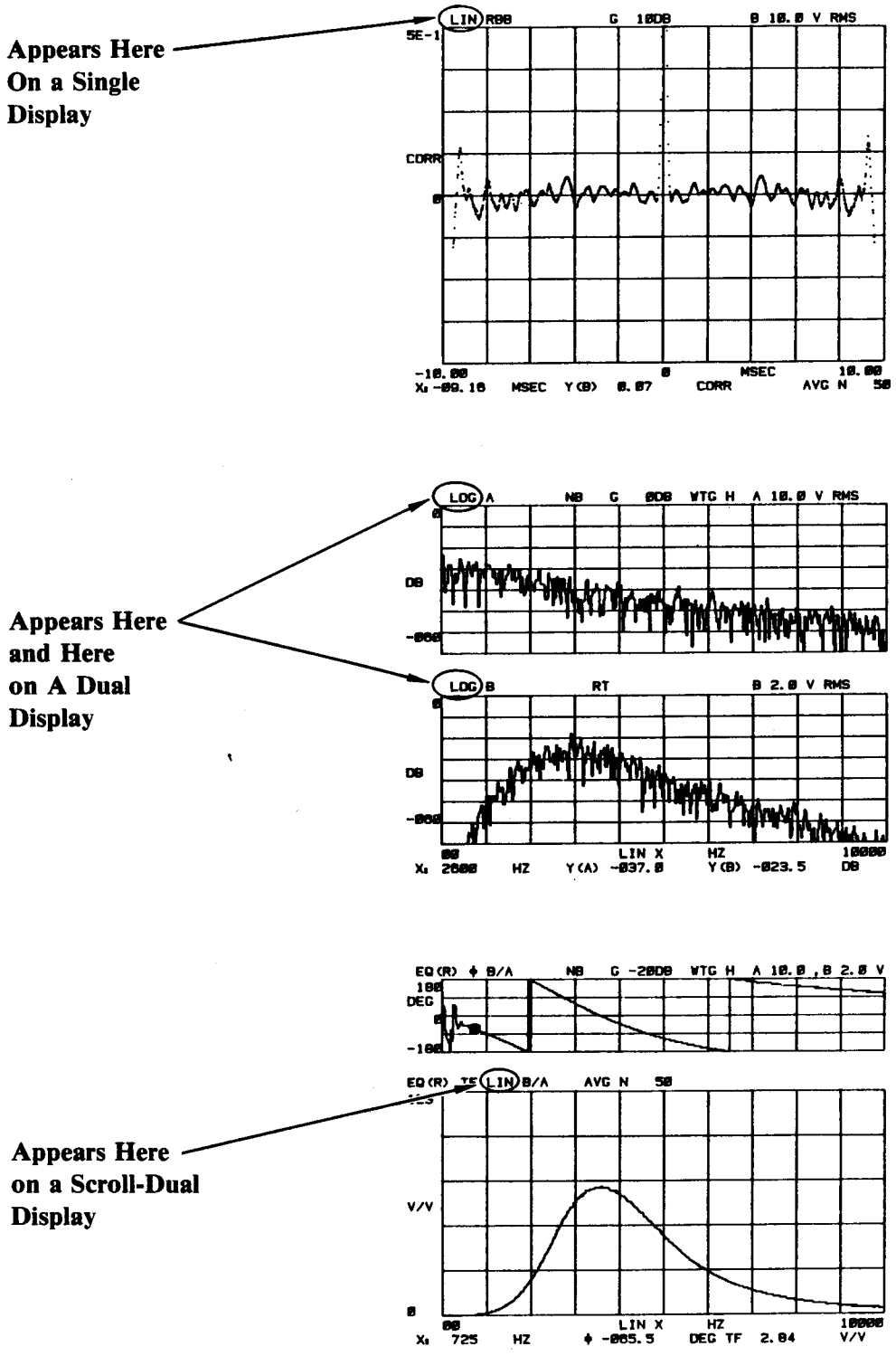


Figure 3-20. Y Axis Distribution Annotation Indications

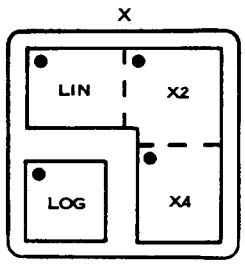
The Y Axis GAIN Touch Controls

These touch controls select display data gain, in dB, on the Y-axis. The range is 70 dB, in 10 dB steps, from +40 dB to -30 dB. For gain displays (not to be confused with y-axis gain) such as transfer function and ratio, the range is 80 dB, in 10 dB steps, from +40 dB to -40 dB. Each time one of these touch controls is pressed the display data gain will increment or decrement (depends upon which one you press) 10 dB until the upper or lower limit is reached.

Display annotation related to these touch controls is shown in Figure 3-21. The first two displays in Figure 3-21 are transfer function examples (gain type displays) showing a range of 80 dB. The display example on the bottom is spectrum, showing a range of 70 dB.

The Y-axis scaling on the left side of the display shown in Figure 3-21 can also be V (volts or some variation of volts such as: V/V or V^2), EU (Engineering Units; a user-entered value for use with various types of sensing devices) or PSD (a variation of EU; specifically EU^2/Hz). Display-data gain can still be selected even through the Y-axis scaling is something other than dB (i.e., V, EU, PSD). Data displays that are unaffected by display-data gain are phase (θ), coherence (γ^2) and PD (probability density).

3.4.3.3 X Axis Scaling and Expansion — The X Axis Group



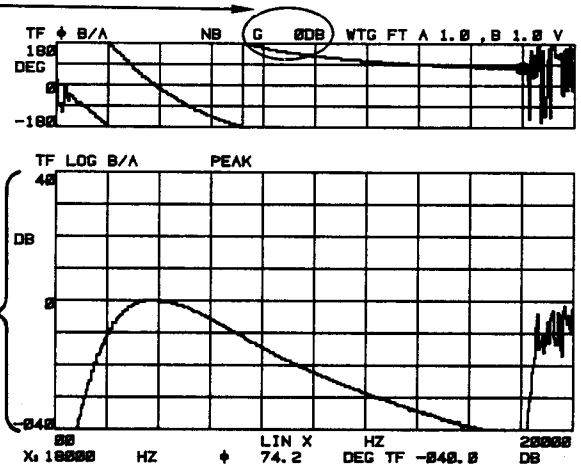
LIN, X2, X4 and LOG Touch Controls

These touch controls select X Axis display-data distribution and X Axis scaling. When the LIN touch control is pressed (LED Lit), X Axis display-data distribution and grid scaling is linear. When the LOG touch control is pressed (LED Lit), X Axis display-data distribution and grid scaling is logarithmic.

The X2 and X4 touch controls provide *linear* X Axis expansion (can't be selected in LOG) *centered* on the cursor location. Specifically, a frequency domain display typically contains 400 data points, yielding a resolution of 1/400 of the selected frequency range. X2 and X4 expansions on the X Axis do not increase the *measured* resolution of the data, they simply display less (X2:200 data points, X4: 100 data points) of the data in the same display area causing the data to be expanded.

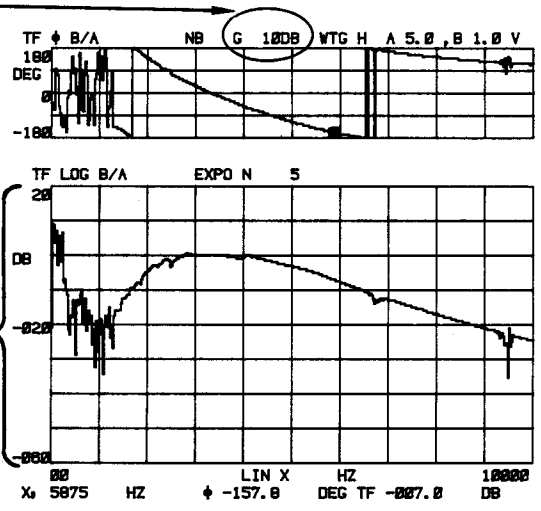
Figure 3-22 shows the display annotation affected by these touch controls, a X4 example and a LOG X example.

Selected gain appears here



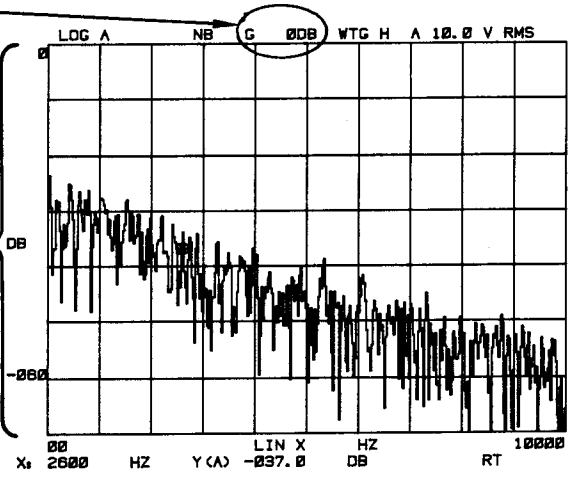
Y Axis grid scaling will reflect any gain changes made by the operator. Note the scaling when no gain is selected

This display shows +10 dB selected, here



Y Axis scaling changes to accomodate the +10 dB gain selection. Note that the range is still 80 dB

Selected gain appears here



Note the Y Axis scaling for a non-gain type display with no gain selected

Figure 3-21. Y Axis GAIN Examples

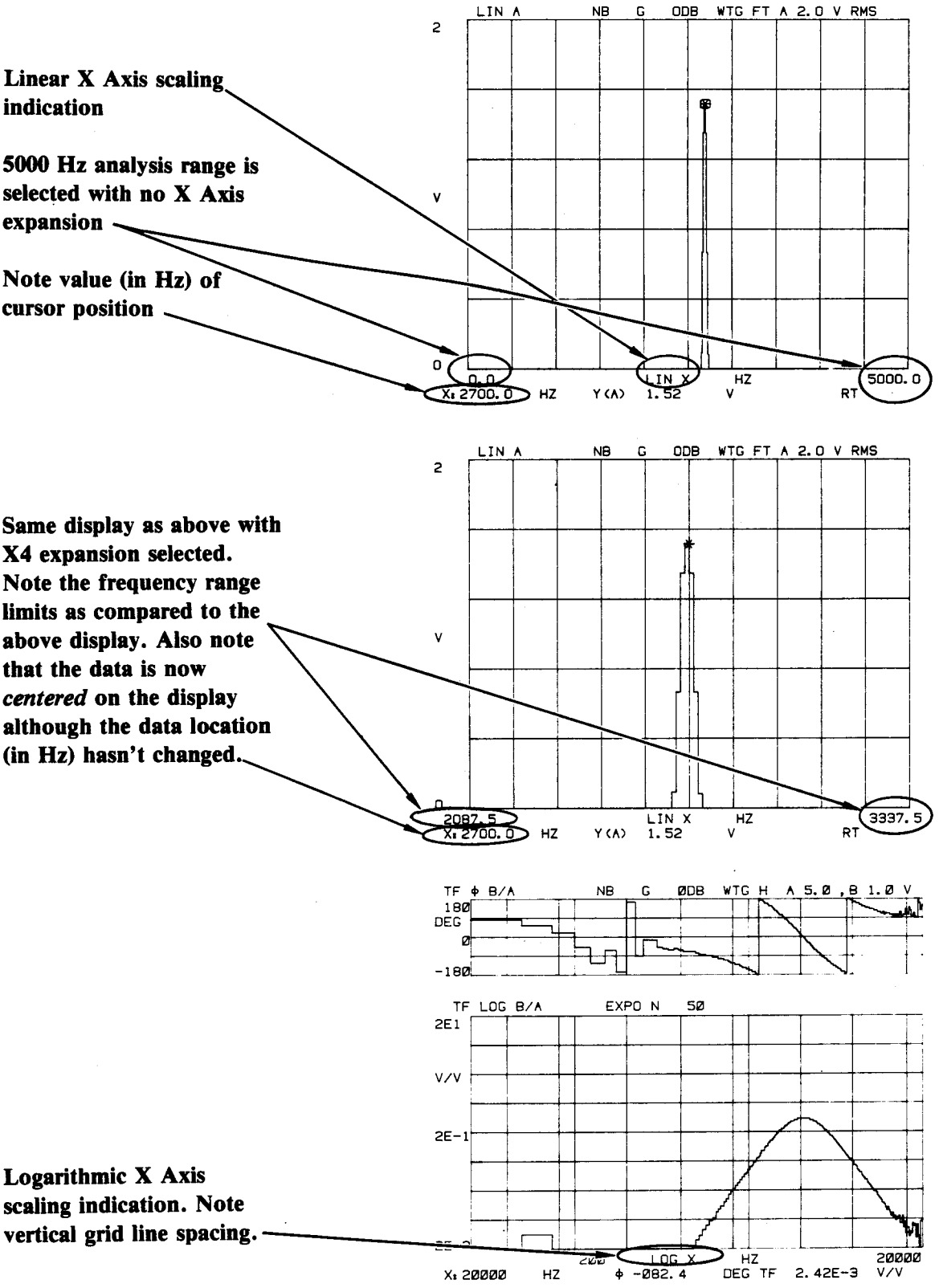


Figure 3-22. X Axis Scaling and Expansion Examples

3.4.3.4 The Θ OFFSET Touch Control

Five of the primary function menu items (SPECTRUM menu selections 11 and 12, TRANSFER FUNCTION menu selections 1 and 5, POWER menu selection 6) display in the upper trace, the phase angle of the FFT.

The Θ OFFSET touch control allows you to select the number of degrees that channel B will be offset in phase with respect to channel A.

Phase offset selection is as follows: First, press the Θ OFFSET touch control. Annotation as shown in Figure 3-23 will appear in the upper right-hand corner of the display. Next, select the number of degrees of offset on the parameters group keypad. Values you can select are from + 180 degrees to -180 degrees in 1 degree increments. Negative values can be assigned by pressing the +/- touch control. Finally, press ENT. The assigned value in the upper right-hand corner of the display will remain for a few moments, and then disappear. The annotation on the left side of the upper display will change to reflect the user-entered phase offset. To recall a user-entered value, press the Θ OFFSET touch control. then press the RCL touch control on the parameters group keypad. The user-entered value will reappear for a few moments, then disappear once again.

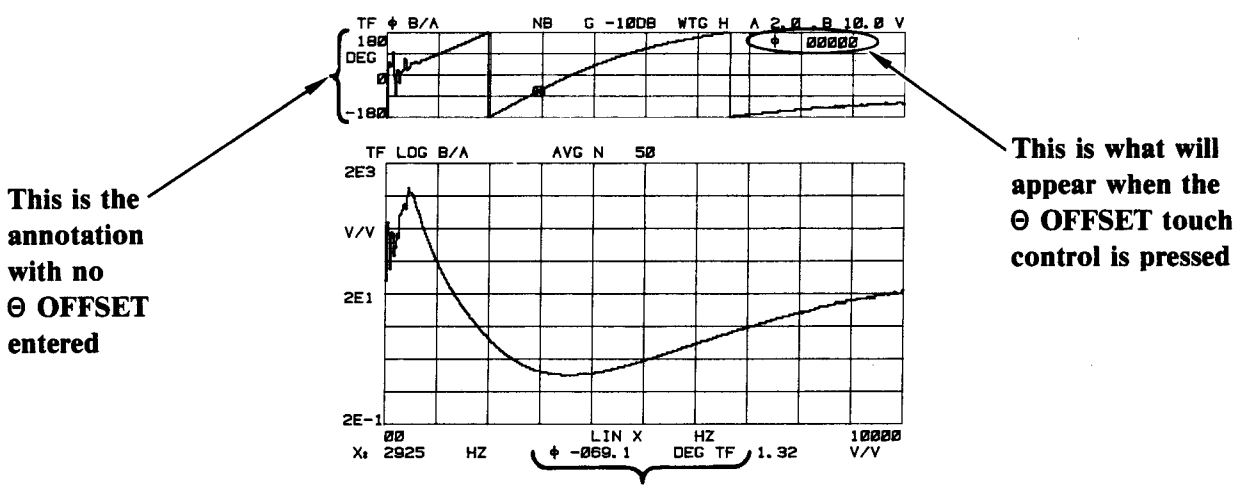
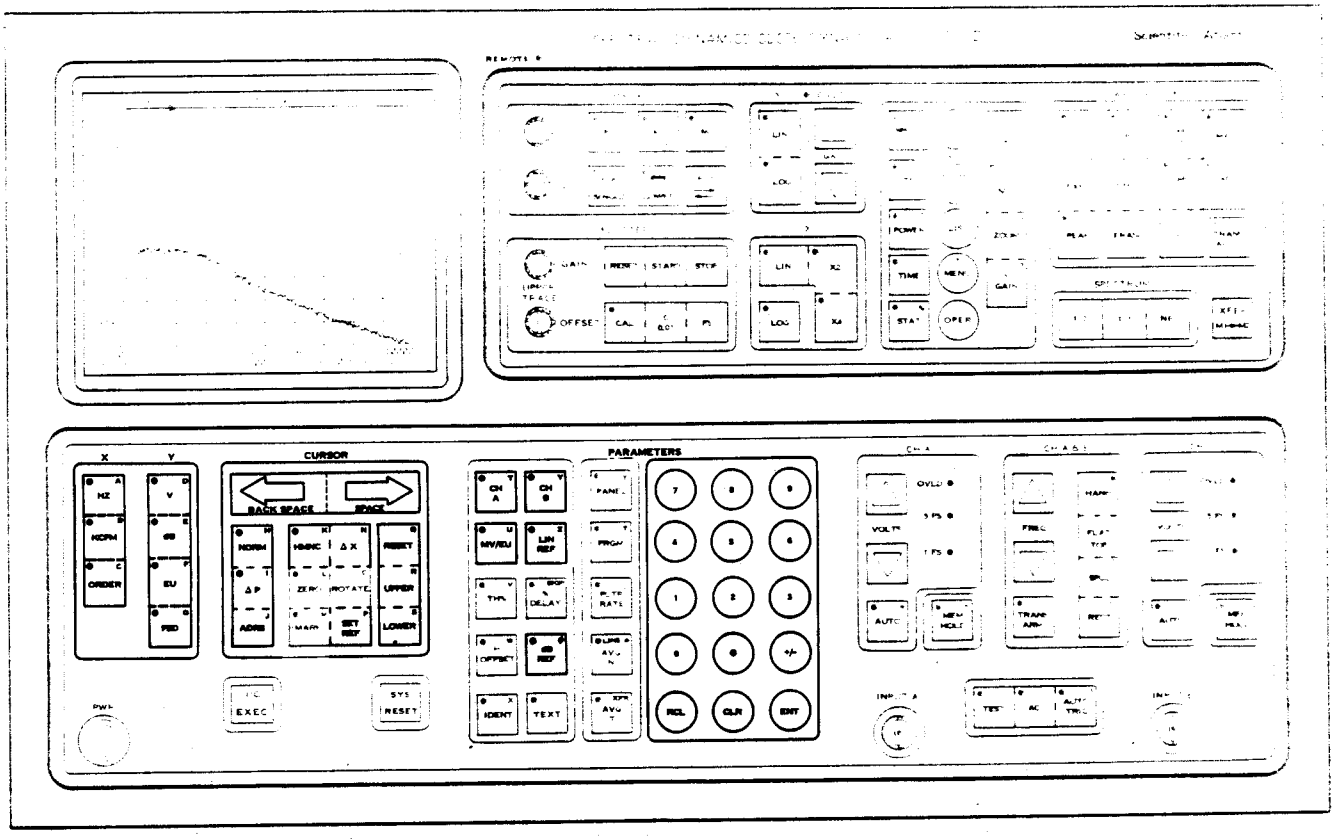
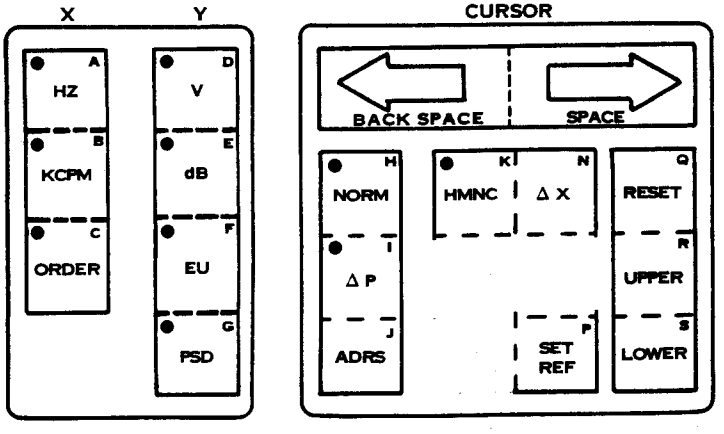


Figure 3-23. Θ OFFSET Entry

3.4.4 Control of Numeric Readouts — The X and Y Axis Units, the CURSOR Group, the CH A, CH B, MV/EU, LIN REF and dB REF Touch Controls and the PARAMETERS Group Keypad



3.4.4.1 The CURSOR Group and the X and Y Touch Controls



NOTE

Some of the following display illustrations are reproductions of the display made on a digital plotter. The plotter, you will notice, does not reproduce the cursor as it appears on the display. The plotter reproduces the cursor like this ✳, or like this ⊠ and is *centered* on the line cursor (the line cursor appears when either of the CURSOR LEFT/RIGHT touch controls are pressed, and disappears when the touch control is released). The actual display cursor is a nine-dot matrix that appears as an intensified dot. In addition, the intensified dot is *not* centered on the line cursor, but offset to the right of the line cursor.

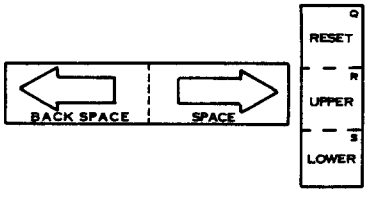
The NORM Touch Control

This touch control selection is the normal cursor mode, and is the cursor mode used most often. The other selections in the CURSOR Group are either variations of the normal mode or are used to control placement of the cursor or for cursor-controlled data manipulation.

When this touch control is pressed (LED lit), the cursor will consist of a single intensified dot that can be moved to any cell location on the display, regardless of the type of display. This can be 400 cells on a frequency domain display (SPECT, TF, POWER), 1024 cells (dual trace)/2048 cells (single trace) on a time domain display or 100 cells on a statistical display.

Using the CURSOR Group Touch Controls

The following paragraphs and accompanying illustrations describe the operation of the CURSOR group touch controls. Each touch control description, when applicable, has an accompanying illustration that relates the selection of a particular touch control to the effect that touch control will have on the display.



CURSOR LEFT/RIGHT, RESET, UPPER and LOWER Touch Controls

This paragraph, used in conjunction with Figure 3-24 describes the operation of the CURSOR LEFT/RIGHT, RESET, UPPER, and LOWER touch controls.

The CURSOR LEFT/RIGHT touch controls move the cursor (intensified dot) to the left or right. Pressing either touch control once will move the cursor one cell, left or right, depending upon which of the

touch controls is pressed. Pressing either of the controls without releasing will cause a line cursor to appear (on both the upper and lower trace in a dual display mode) on the display. The line cursor will move in the indicated direction until the control is released. When the touch control is released, the line cursor will disappear.

The RESET touch control resets the cursor to cell 1 (the beginning of the display).

The UPPER and LOWER touch controls place the cursor in either the upper or lower trace when the instrument is in a dual display mode.

HMNC, SET REF and ORDER Touch Controls

This paragraph, used in conjucntion with Figure 3-25 describes the operation of the HMNC, SET REF, and ORDER touch controls.

THE HMNC touch control, when pressed, places multiple cursors (intensified dots) at each harmonic multiple of the fundamental cursor location. (Refer to the upper trace data in Figure 3-25.) Initially, the cursors won't be properly aligned. Hence, the fundamental cursor has a resolution that is 1/256 of the normal resolution. Alignment of the multiple cursors can be accomplished by pressing either of the CURSOR LEFT/RIGHT touch controls several times until all the intensified dots are properly aligned. After this is accomplished, press the SET REF touch control. The positions of the intensified dots will be frozen and a line cursor will appear at the fundamental. The line cursor (intensified dot plus vertical line) can now be moved to any of the 400 cell locations on the display.

The X-units ORDER touch control, when pressed, references the X-axis value on the display to the location of the cursor in terms of its harmonic relationship to the selected fundamental component.

ΔX, ΔP, and SET REF Touch Controls

This paragraph, used in conjunction with Figure 3-26 describes the operation of the ΔX, ΔP and SET REF touch controls. (Remember, the SET REF touch control is also used in conjunction with the HMNC touch control.)

When the ΔX touch control is pressed, a permanent line cursor will appear along with the already-present intensified dot. If the SET REF touch control is *not* pressed, the instrument will operate the same as it does when the NORM cursor mode is selected; the only difference being the presence of a permanent line cursor. When the SET REF touch control is pressed, *after* ΔX is pressed, the permanent line cursor will become frozen at its present position. (it's a good idea to move the permanent line cursor to the desired reference point on the display before pressing the SET REF touch control.) When this is accomplished, the X-axis values will be designated ΔX, and the same X-axis values will be referenced to the position of the frozen line cursor. The X-axis value of the frozen line cursor, regardless of its position on the display, will be zero. Now, when the cursor is moved in either direction, another line cursor (accompanied by the intensified dot) will appear. The X-axis values, referenced to the frozen line cursor, will appear as positive values on either side of the frozen line cursor.

The ΔP touch control, when pressed, provides a summation of the rms value of the power level of all the displayed information to the left of the cursor, regardless of its position on the display. Changing the position of the cursor will vary the indicated power level. The ΔP mode also operates in conjunction with the ΔX mode to indicate the rms level between two selected frequencies. The Y-axis cursor value in this mode will be designated ΔP representing the rms value of spectrum information displayed on the crt.

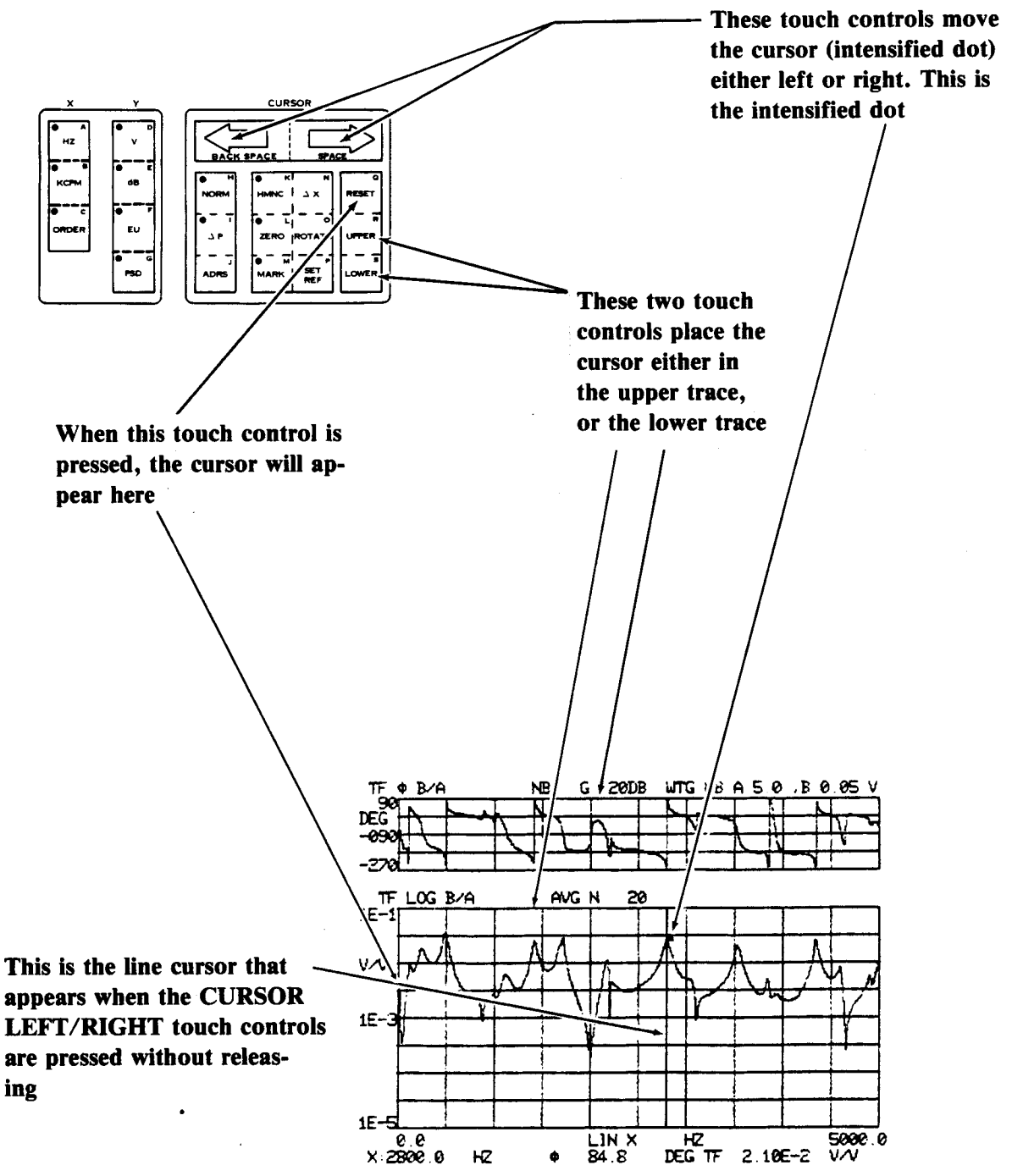
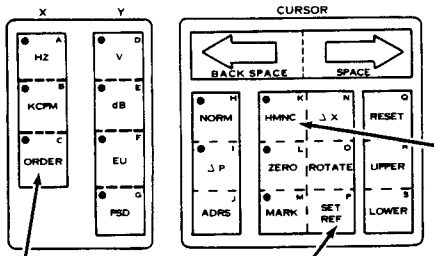


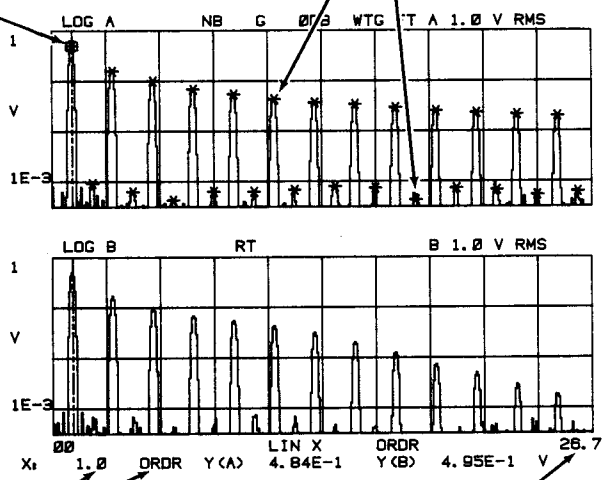
Figure 3-24. Description of the CURSOR LEFT/RIGHT, RESET and UPPER and LOWER Touch Controls



This touch control places multiple cursors (intensified dots) at each harmonic multiple of the fundamental.

The two examples indicated by the arrows, below, are typical of all the intensified dots.

This is the touch control that freezes the intensified dots and causes a line cursor to appear. This is the line cursor. (This touch control is also used for the ΔX mode.)

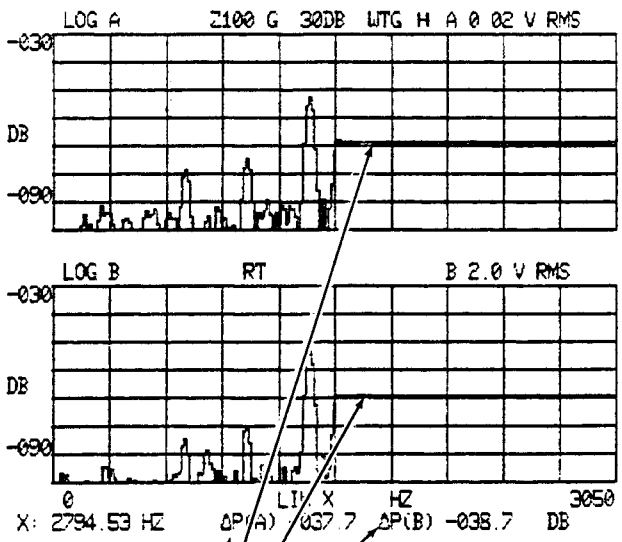


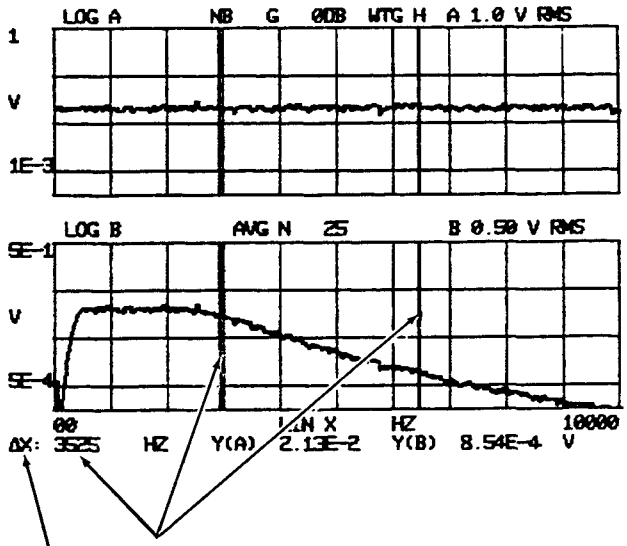
This is the touch control that references the X-axis values in terms of the harmonic relationship to the selected fundamental.

Order value of the fundamental cursor location. This value will change as the cursor is moved.

Total number of ORDERS displayed.

Figure 3-25. Description of the HMNC, SET REF AND ORDER Touch Controls

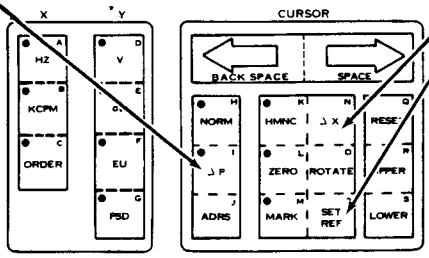




This value indicates the distance between these two lines.

When the ΔP touch control is pressed, this will be the display indication.

When the ΔX and the SET REF touch controls are pressed, this is the designation.



This is an example of ΔP used in conjunction with ΔX

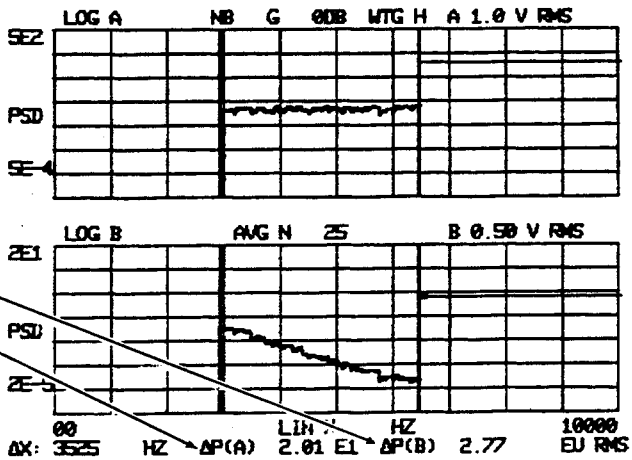


Figure 3-26. Description of the ΔX, ΔP and SET REF Touch Controls

ADRS The ADRS Touch Control

The ADRS touch control is used to place the cursor at any cell location on the display without using the CURSOR LEFT/RIGHT touch controls. This feature can also be used to display the current cursor position by cell location.

Operation of this feature is accomplished as follows: First, press the ADRS touch control. The annotation "ADRS 00000" will appear in the upper right-hand corner of the display, just inside the grid. Next, select the desired cell using the PARAMETERS group keypad (frequency domain 1-400, time domain 1-1023). Press ENT. The cursor will appear at the selected cell location.

Unlike other user-entered parameters, pressing ADRS then RCL will not display the last ADRS entry made by the operator. What will be displayed (in the upper right-hand corner or the grid) when ADRS and RCL are pressed, will be the *current* cursor position, by cell number.

Figure 3-27 is a display example showing an ADRS selection that has yet to be entered. If the ENT touch control were pressed, the cursor would move to cell 375 and display annotation reflecting the current cursor position would read "X: 18750 Hz" instead of "X: 800 Hz". If ADRS then RCL were pressed, the cursor would remain at its current position (800 Hz) and the annotation in the upper right-hand corner of the grid would read: "ADRS 00016".

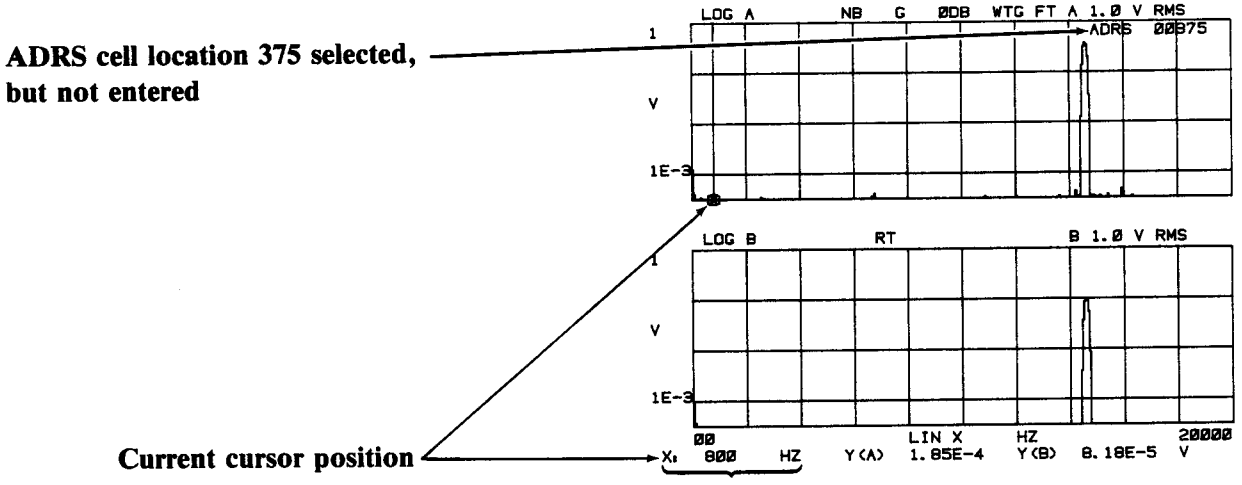
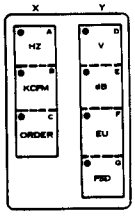


Figure 3-27. ADRS Selection Example



The X and Y Touch Controls

The X and Y touch controls select the units of measurement for display on the X and Y axis.

HZ Touch Control

When this touch control is pressed (LED Lit), the X-axis annotation will reflect the value of the cursor position in Hz in relation to the selected full-scale analysis range.

NOTE

There is no touch control for seconds or milliseconds. Therefore, if a time domain display is selected, the X-axis values will be the corresponding memory period (in seconds or milliseconds) that relates to the selected full scale analysis range (in Hz).

KCPM Touch Control

When this touch control is pressed (LED Lit), the X-axis annotation will reflect the value of the cursor position in KCPM (Kilo Cycles Per Minute) in relation to the selected full-scale analysis range.

ORDER Touch Control

When the HMNC cursor mode has been selected and the intensified dots are frozen, (SET REF) the annotation reflects the location of the cursor in terms of its harmonic relationship to the selected fundamental component. Orders can also be selected in NORM mode.

Examples of these three touch controls are shown in Figure 3-28.

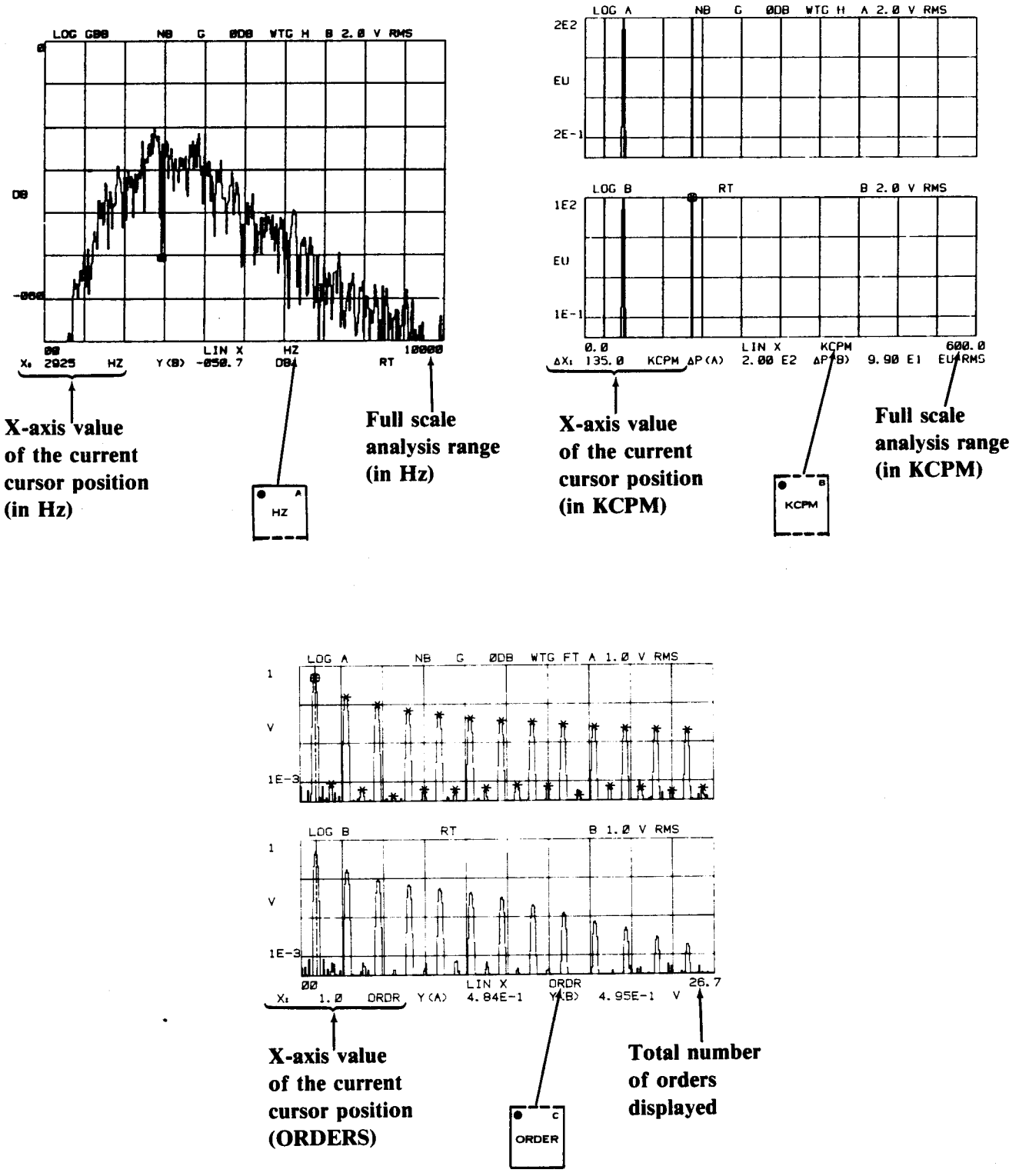


Figure 3-28. Examples of the HZ, KCPM and ORDER Touch Controls

V Touch Control

When this touch control is pressed (LED lit), the Y axis scaling and cursor amplitude readouts will be in volts rms. This scaling will vary depending upon the type of display. These variations are: V(spectrum, time) V/V (transfer function, ratio), V^2 (power). Examples of these variations are shown in Figure 3-29.

An exception to the preceding information is the STATISTICAL menu. Statistical Y axis data is either "occurances within a voltage window" or "% total occurances." X axis data on a display is peak voltage (± full scale) indicated by the annotation "V PK."

DB Touch Control

When this touch control is pressed (LED lit), the Y axis scaling and cursor amplitude readouts will be in dB. With the exception of transfer function and ratio type displays, the full scale level on the display will be 0 dB. This will not be the case if any Y axis gain is selected as described on page 3-83 and 3-84. Also, dB cannot be selected for a time display or when linear Y axis scaling is selected. An example of the dB touch control is shown in Figure 3-30.

EU Touch Control

When this touch control is pressed (LED lit), Y axis scaling and cursor amplitude readouts will be in Engineering units. Engineering Units are a user-entered value representing the probe relationship between voltage and a measured quantity, or a linear reference value designated by the operator. The probe can be an accelerometer, displacement-type, velocity pickup, or any one of several types of dynamic motion, or audio measuring devices (transducers). Operation of this touch control is directly related to the MV/EU and LIN REF touch controls. Since this value is voltage-related, Y axis scaling for Engineering Units will have the same scaling variations as the volts Y axis scaling, i.e., EU, EU/EU or EU^2. Examples of these variations are shown in Figure 3-31.

PSD Touch Control

When this touch control is pressed (LED lit), Y axis scaling and cursor amplitude readouts will be in Power Spectral Density (PSD) units; specifically EU^2/Hz.

When measuring continuous signals with broadband spectrum content such as random vibration or acoustical noise, a standard spectrum analysis and display may not be enough. Broadband signals often contain energy at all frequencies but, at any selected frequency, the actual amount of energy can be quite small. In these cases, it is the accumulation of energy or the summation of the spectrum contribution at many frequencies that add up to the total, potentially damaging signal level. The PSD feature provides a means for measuring this total signal level. As an example, if a random vibration signal is being analyzed, the operator simply enters the signal sensitivity of the selected channel such as 31.6 mV/EU corresponding to 31.6 mV/g. Now, when the PSD touch control is pressed, the display is automatically calibrated in terms of $grms^2$ per Hz with the correct bandwidth and selected weighting function characteristics automatically included in the display scaling. The spectrum contribution in terms of grms between any two selected frequencies can then be quickly calculated and displayed using the ΔX, ΔP touch control combination as described on page 3-89.

An example of the display annotation affected by the PSD touch control is shown in Figure 3-32.

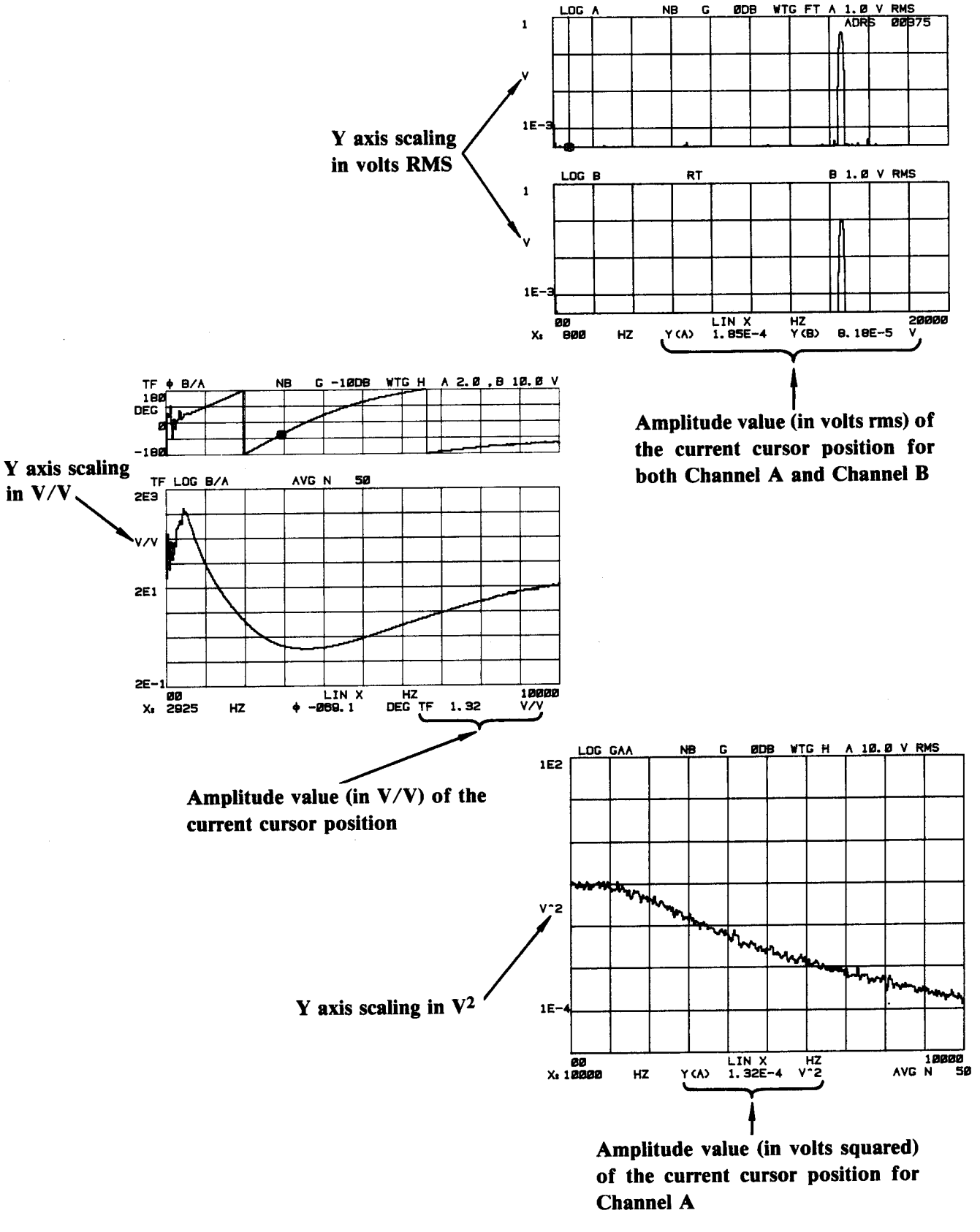


Figure 3-29. Annotation Examples of the Volts Touch Control

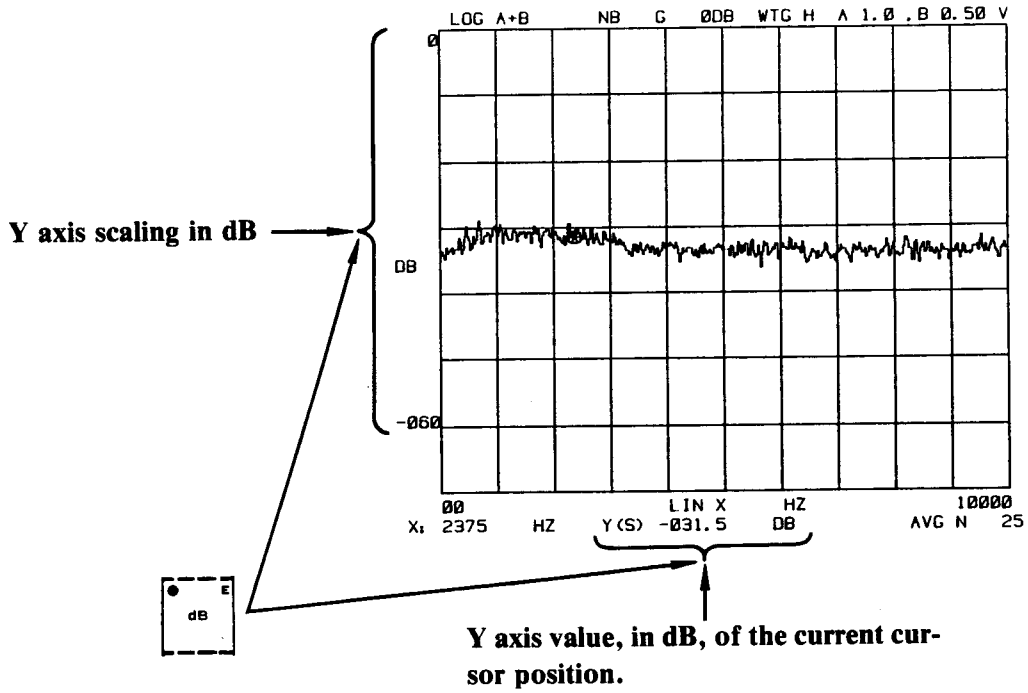


Figure 3-30. Annotation Example of the dB Touch Control

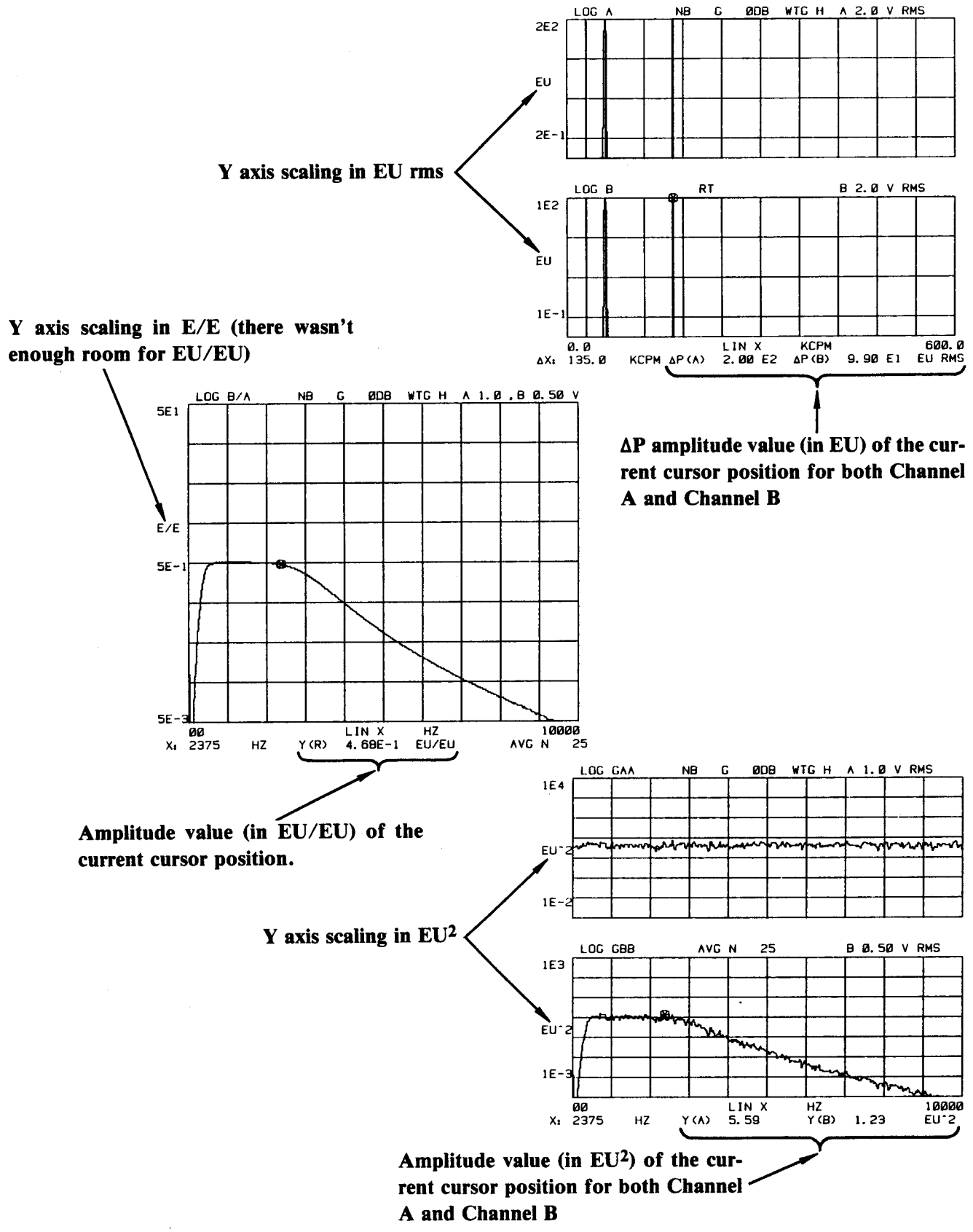


Figure 3-31. Annotation Examples of the EU Touch Control

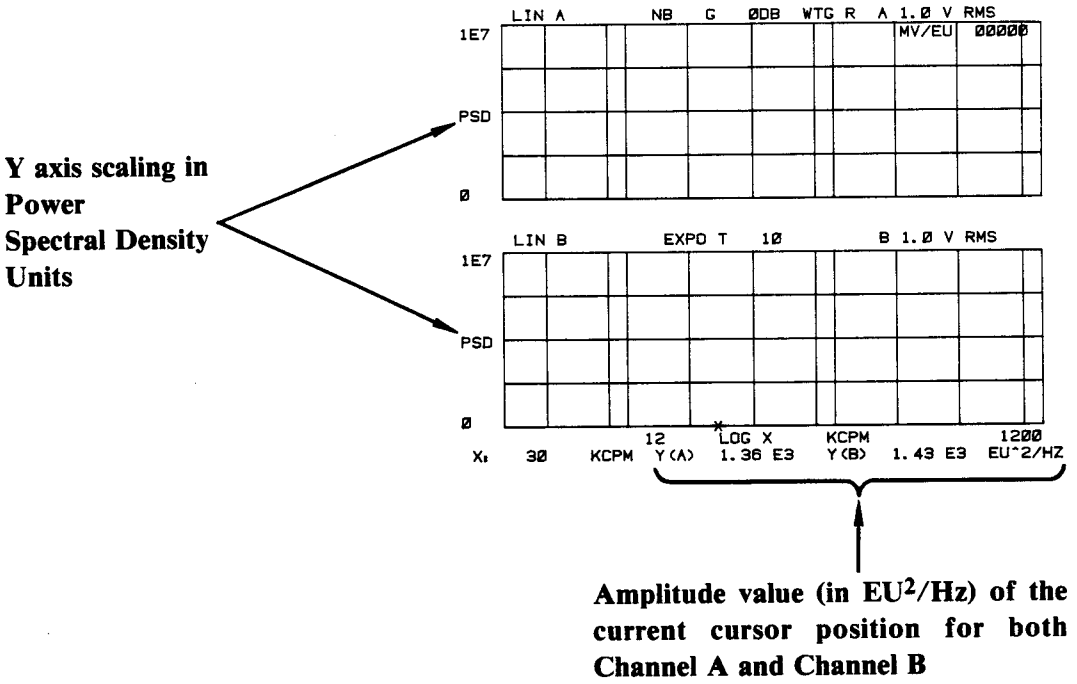
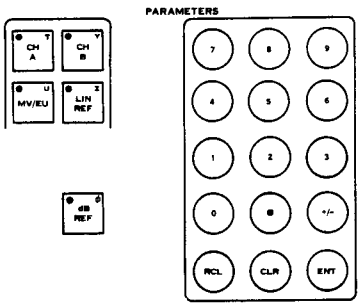


Figure 3-32. Annotation Example of the PSD Touch Control

3.4.4.2 The CH A, CH B, MV/EU, LIN REF and dB REF Touch Controls and the PARAMETERS Group Keypad



The CH A and CH B Touch Controls

These touch controls determine the channel for assigning specific parameter values. For example, if the CH A touch control has its LED lit, then MV/EU, LIN REF, TH%, % DELAY or dB REF values will be entered for Channel A only. The same is true for the CH B touch control. Values not specific to a particular channel such as, θ OFFSET, IDENT, TEXT, etc., are unaffected by these touch controls.

MV/EU Touch Control

This touch control is used to select transducer sensitivity in millivolts per engineering unit. Resultant values will depend upon the type of measuring device being used. For example, if the measuring device is an accelerometer, the MV/EU value entered by the operator can represent mV/g or if the measuring device is a displacement probe, then the selected mV/EU value can represent mV/mil. Just what value you enter depends upon the calibration specifications for the measuring device being used. Numerical values you can select are from 0.001 to 9,999.

MV/EU selection is as follows: First, select the desired channel by pressing either the CH A or the CH B touch control.

NOTE

If both channels are to be assigned an mV/EU value, a separate entry must be made for each channel. Also, each channel can have a different assigned value.

Next, press the mV/EU touch control. Annotation as shown in Figure 3-33 will appear in the upper right-hand corner of the display. Now, select the desired numerical value using the PARAMETERS group keypad, then press ENT. The assigned value in the upper right-hand corner of the display will remain for a few moments, then disappear.

Once the ENT touch control is pressed, and either EU or PSD Y units are selected, Y axis display scaling will change to reflect the user-entered mV/EU value. To recall the entered value, press the mV/EU touch control, then press RCL. The entered value will reappear for a few moments, then disappear once again.

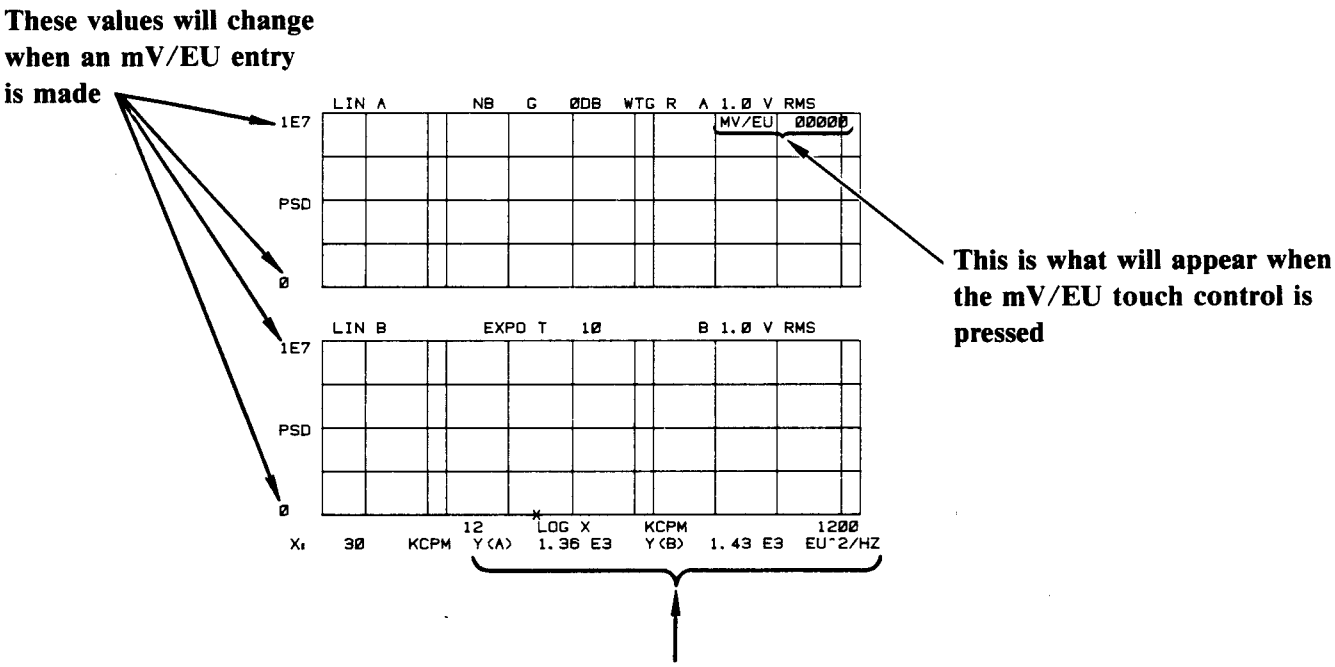


Figure 3-33. mV/EU Entry

LIN REF Touch Control

This touch control is used to assign an EU value referenced to a measured signal. When a linear reference value is selected and entered, and either EU or PSD Y units are selected, Y axis display scaling will change to reflect the user-entered linear reference value. This is shown in Figure 3-34.

LIN REF selection is as follows: First, select the desired channel by pressing either the CH A or CH B touch control. As with the mV/EU touch control, a separate entry must be made for each channel. Next, press the LIN REF touch control. Annotation as shown in Figure 3-34 will appear in the upper right-hand corner of the display. Now, select the desired numerical value using the PARAMETERS group keypad, then press ENT. The assigned value in the upper right-hand corner of the display will remain for a few moments, then disappear. To recall the entered value, press LIN REF, then press RCL. The entered value will reappear for a few moments, then disappear once again.

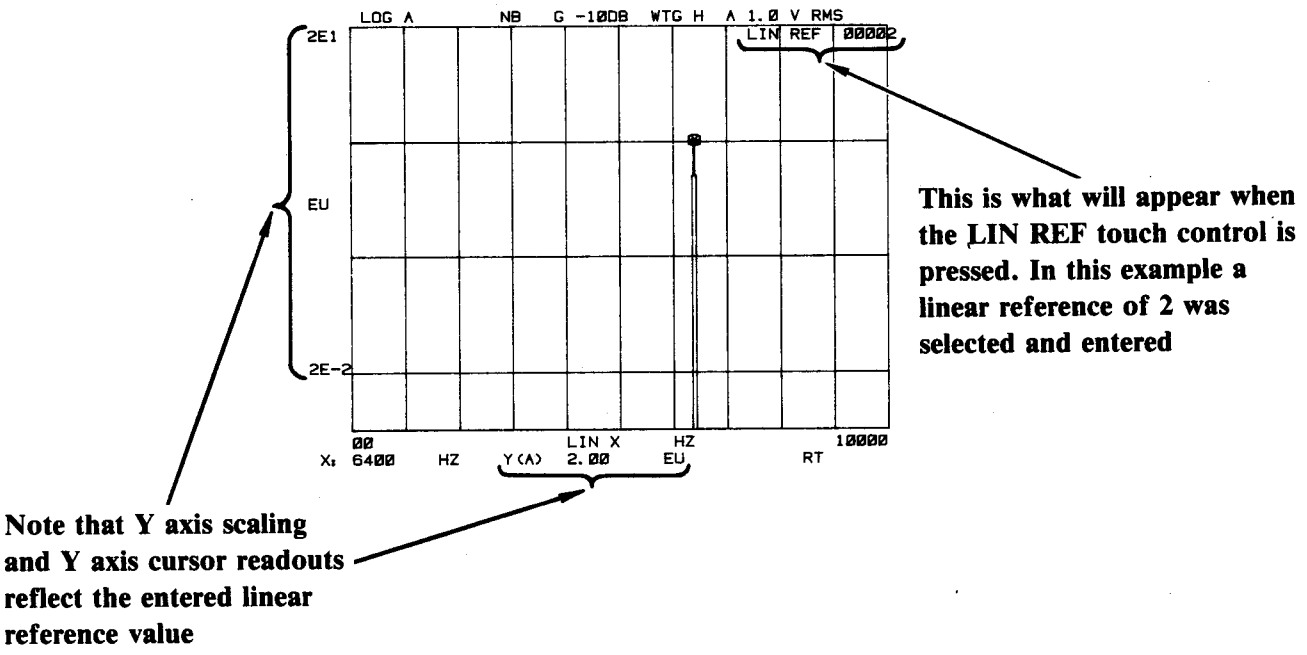
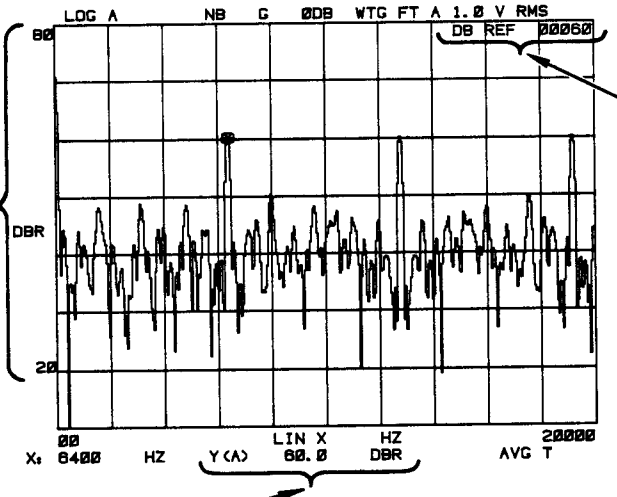


Figure 3-34. LIN REF Entry

dB REF Touch Control

This touch control is used to assign a dB reference level to a measured signal rather than the selected input level. When a dB reference value is selected and entered, Y axis display scaling will now read DBR with dB values reflecting the user-entered dB reference. In addition, Y axis cursor readouts will also reflect the user-entered dB reference.

DB reference selection is as follows: First, select the desired channel by pressing either the CH A or CH B touch control. As with the mV/EU and LIN REF touch controls, a separate entry must be made for each channel. Next, press the dB REF touch control. Annotation as shown in Figure 3-35 will appear in the upper right-hand corner of the display. Now, select the desired numerical value using the PARAMETERs group keypad, then press ENT. The assigned value in the upper right-hand corner of the display will remain for a few moments, then disappear. To recall the entered value, press dB REF, then press RCL. The entered value will reappear for a few moments, then disappear once again.

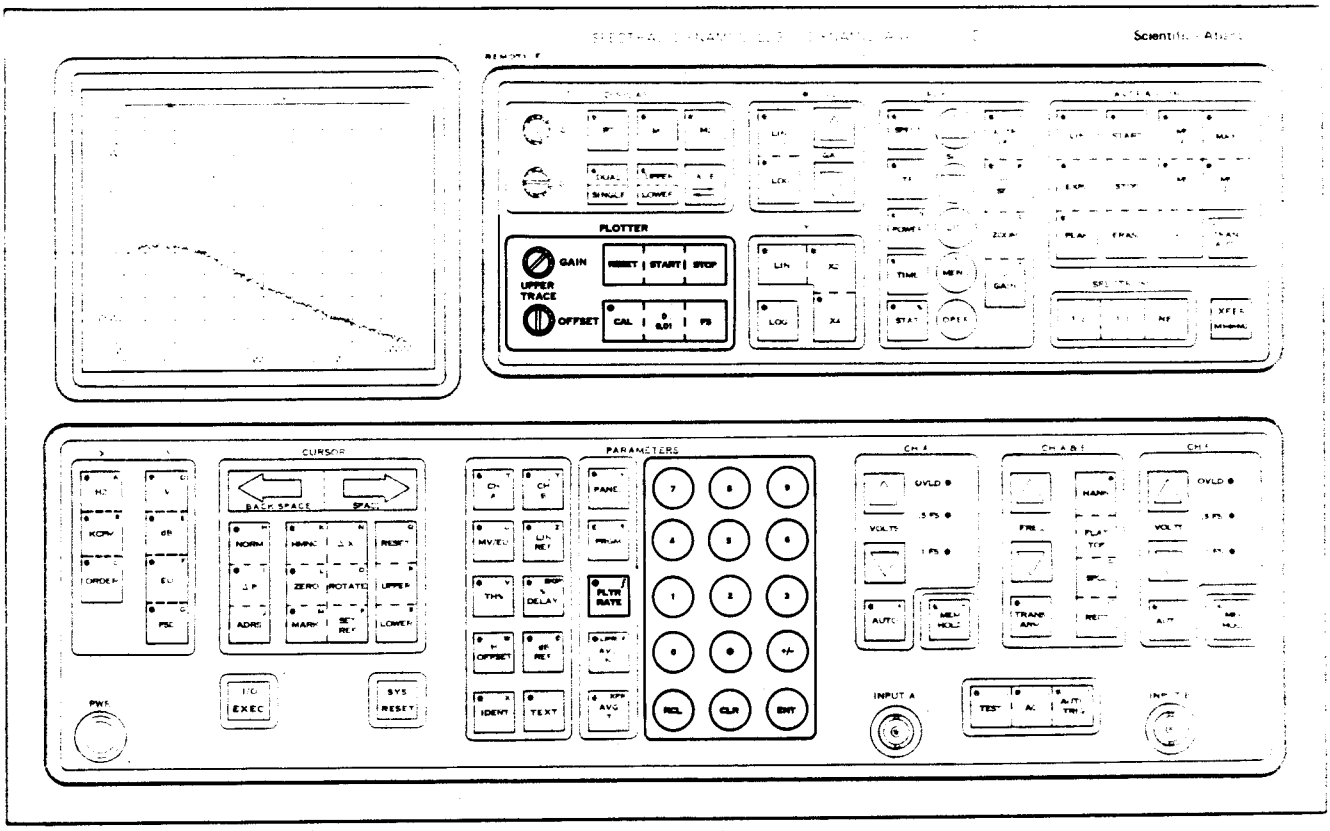


This is what will appear when the dB REF touch control is pressed. In this example a dB REF of 60 dB was selected and entered.

Note that Y axis scaling and Y axis cursor readouts reflect the entered dB reference value

Figure 3-35. dB REF entry

3.4.5 Plotter Operation — The PLOTTER Group, the PLTR RATE Touch Control and the PARAMETERS Group Keypad



This group of touch controls is used for both analog and digital plotter operation with the exception of the GAIN and OFFSET controls and the PLTR RATE touch control. These particular controls are used for analog plotter operation only.

The following information applies, for the most part, to analog plotter operation. Digital plotter operation requires the -3 option to be installed and instructions specific to digital plotter operation are contained in the -3 option manual.

The analog plotter function features simulplot (continuous crt display during the analog plot mode) and X axis sweep rate control for automatic slowdown while plotting data peaks. In addition, X, Y and PEN LIFT outputs are provided on the rear panel as shown in Figure 3-36.

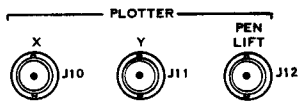


Figure 3-36. Rear Panel Analog Plotter Connections

RESET Touch Control

This touch control resets the display cursor and the plotter pen to the beginning of the trace.

START Touch Control

This touch control initiates the plotting function for both analog and digital plotters.

STOP Touch Control

This touch control stops the plotting function, activates the pen-lift command and allows the input memories to start updating again. For digital plotters, this touch control simply stops the plotting operation. The input memories continue updating during a digital plot.

CAL Touch Control

When this touch control is pressed (LED lit), the plotter calibration circuits, for positioning the pen on either an analog or digital plotter, are energized.

0, 0.01 Touch Control

This touch control determines the plotter pen lower-left grid limits on both an analog and digital plotter. This feature is extremely useful for calibrating either type of plotter when using pre-printed graph paper, or for dimensioning a plot to a specific size. Just where the pen ends up depends upon the selected display X and Y axis data distribution. The plotter pen will move to one of the three points, corresponding to a point on the display grid.

Pen positions, depending upon selected display X and Y axis data distribution, are as follows:

a. LIN X and Y Data Distribution: Zero amplitude on the Y axis and zero on the X axis, or more simply, the lower left-hand corner of the grid. Now, when you set the lower-left limit on the plotter, this point will correspond to the lower left-hand corner of the display grid.

b. LIN X and LOG Y Data Distribution: –40 dB down on the Y axis and zero on the X asis. The plotter pen will represent 40 dB down on the Y axis and the left-hand side of the display grid on the X axis. Used for positioning the plotter pen on Log-Y graph paper.

c. LOG X and LOG Y Data Distribution: –40 dB down on the Y axis and –2 decades over on the X axis. Used for positioning the plotter pen on LOG-LOG graph paper.

FS Touch Control

This touch control determines the plotter pen upper-right limits on both an analog and digital plotter. When this touch control is pressed, plotter pen position will represent the upper right-hand corner of the display grid.

UPPER TRACE GAIN and OFFSET Controls

These two potentiometers are used when performing an analog plot of dual-display data and control the gain (amplitude) and the position (up or down) of the plotted upper-trace data, independent of the lower trace.

PLTR RATE Touch Control

Pressing the PLTR RATE (analog plotter rate) touch control enables the operator to select one of four available analog plotter rates (15, 30, 45 or 60 seconds based on a dual trace display and no input signal applied) via the PARAMETERS group keypad.

Plotter rate selection is as follows: First, press the PLTR RATE touch control. Annotation as shown in Figure 3-37 will appear in the upper right-hand corner of the display grid. Next, select one or four plotter rates using the PARAMETERS group keypad (1 = 60 seconds, 2 = 45 seconds, 3 = 30 seconds and 4 = 15 seconds). Finally, press the ENT touch control. The selected plotter rate will remain for a few moments, then disappear. To recall a selected plotter rate, press the PLTR RATE touch control, then press RCL. The selected plotter rate will reappear for a few moments, then disappear once again.

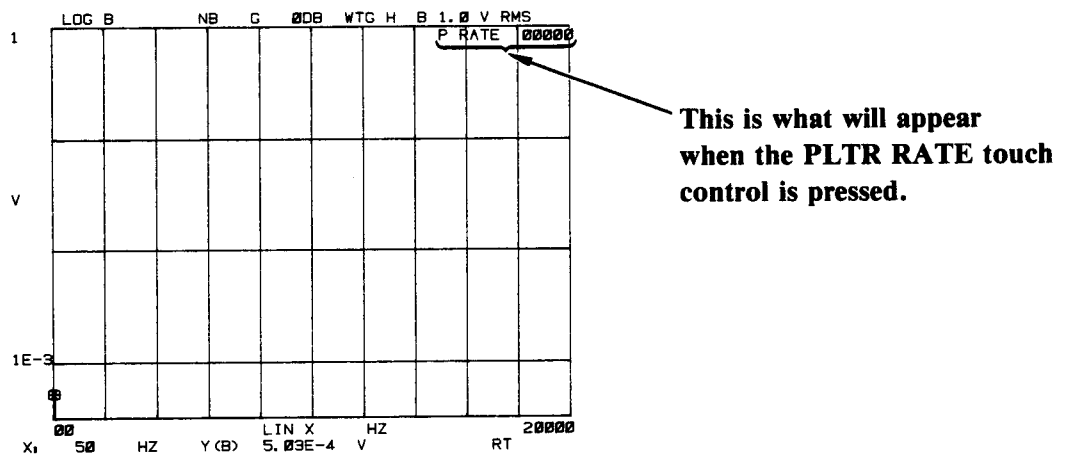
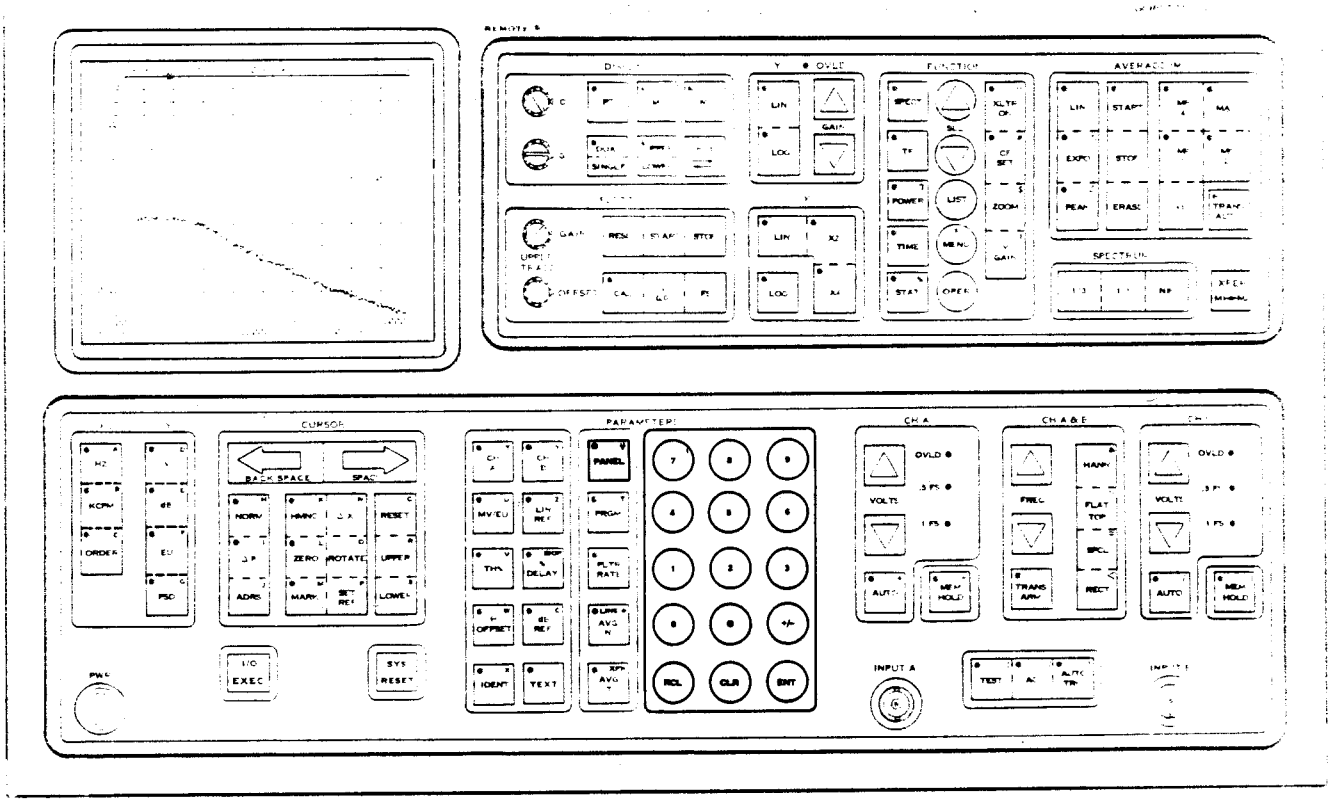


Figure 3-37. Plotter Rate Selection

3.4.6 Panel Recall and Storage — The PANEL Touch Control and the PARAMETERS Group Keypad



On the front-panel of the SD375, you will notice, in the PARAMETERS group, a touch control labeled "PANEL." This touch control is used by the operator to STORE and RECALL front-panel configurations. The panels available are panels 0 through 9, but only 7 can be stored for later recall by the operator.

Here they are:

- Panel 0 is a defined constant that can be obtained by pressing PANEL, 0, RCL. This is described in subsection 3.3.1 and in Section IV, the Operational Checkout.
- Panels 1 through 7 are the operator's arbitrary *store* panels.
- Panel 8 is the *current* front panel. This is also the front panel the I/O option uses.
- Panel 9 is the front panel from the last time M1 was transferred to M2. When you press M2, you go to the front panel defined in Panel 9.

3.4.6.1 Where the Front Panel Comes From

There is a STATIC, battery-maintained RAM where all of these panels are stored, defined in a 101 byte string of codes. During normal operation of the SD375, the front panel configuration is determined by a set of codes in *system* RAM, which, every half second, is stored in the PANEL 8 area of the STATIC RAM. On power-up (or when PANEL 8, RCL is pressed), the codes from PANEL 8 are copied into *system* RAM (which is *not* a STATIC RAM).

This feature provides the capability to store any desired front panel configuration which can then be recalled at the operator's discretion. The selected front panel configuration or configurations are stored for approximately 10 days, even after power is removed.

To store or recall a front panel configuration, perform the following:

a. Press the PANEL touch control.

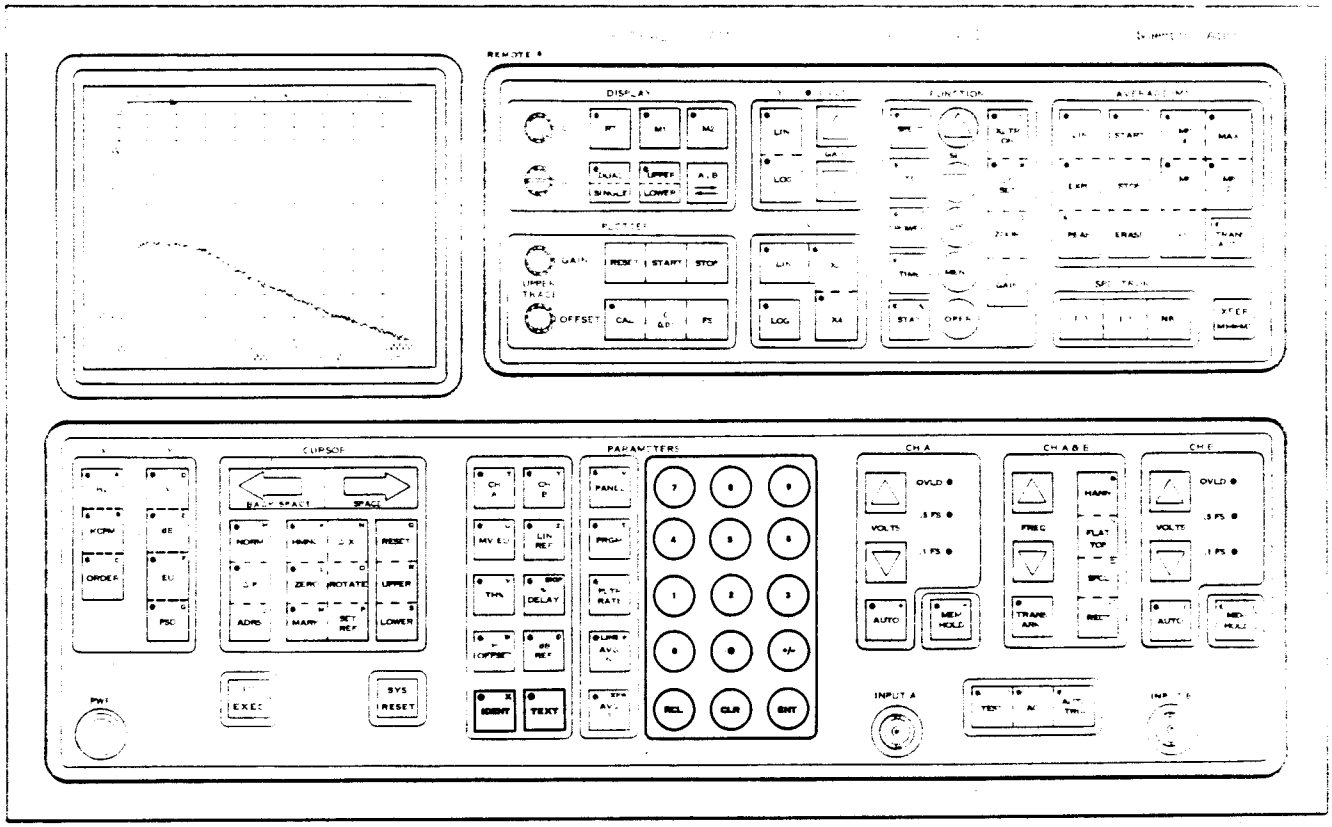
b. Assign a number (from 1 to 7) to the selected front panel configuration and record the number (do not assign duplicate numbers as the previously stored configuration in the STATIC RAM will be deleted).

c. Press the number, selected in step b, on the PARAMETERS group keypad.

d. Press the ENT touch control.

To recall a stored front panel configuration, press PANEL, press the assigned number on the keypad, then press RCL. When RCL is pressed, the front panel will assume the stored configuration.

3.4.7 Customizing CRT Annotation — The IDENT and TEXT Touch Controls and the PARAMETERS Group Keypad



IDENT Touch Control

This touch control is used to assign an ID number to a specific display. When the IDENT touch control is pressed (LED lit), annotation as shown in Figure 3-38 will appear in the upper right-hand corner of the display grid. When an ID number is selected and entered, the ID number will shift from the upper right-hand corner of the display to the upper left-hand corner of the display grid. This is also shown in Figure 3-38. The reason for the ID number shift is that an assigned ID number remains on the display, and if it were to remain in the upper right-hand corner, it would interfere with other parameter entries. Also, an ID number assigned to a specific display will automatically be assigned to the corresponding MARK listing for that display.

ID number selection is as follows: First, press the IDENT touch control. The LED on the IDENT touch control will light and the annotation "ID 00000" will appear in the upper right-hand corner of the display grid. Next, assign an ID number using the PARAMETERS group keypad, then press ENT. The assigned ID number will shift to the upper left-hand corner of the display grid and will remain on the display until either another ID number is assigned or the ID number is cleared. This is accomplished by pressing the IDENT touch control, then the CLR touch control.

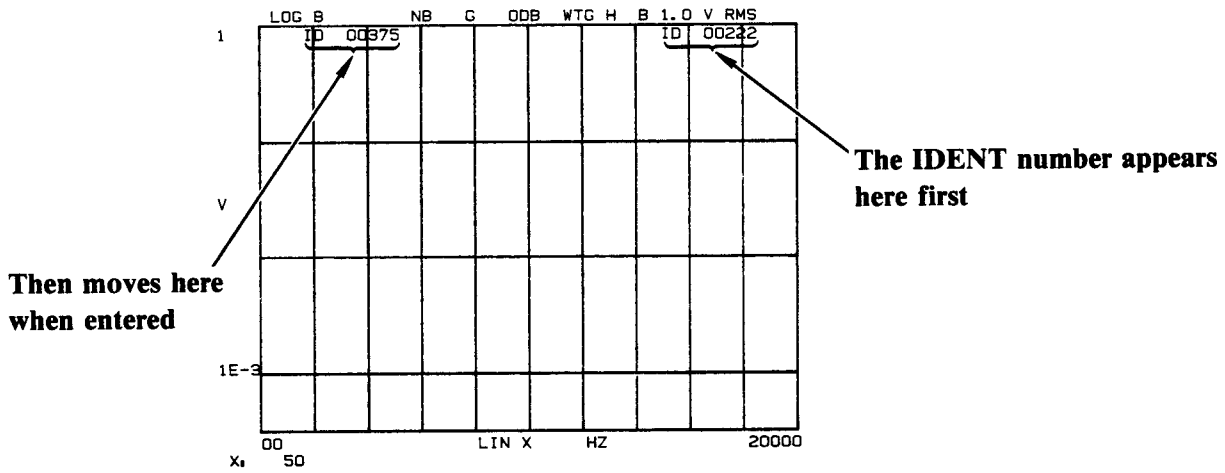


Figure 3-38. Example of the IDENT Touch Control

TEXT Touch Control

By now you're probably wondering what all the small letters and symbols are on some of the touch controls. These are the dual-function touch controls for the text entry feature.

In addition to the text entry dual function touch controls, a laminated card with a front-panel overlay is provided with user instructions printed on the other side. The touch controls on the card, indicated in red, are the controls for text entry. They are enabled only when the text entry feature is enabled and operate much the same as the dual function keys on a calculator.

Before you get started, there are a few things you should know about the feature.

Once text entry is enabled, standard front-panel operation of the SD375 is locked out.

Text entry cannot be performed until a line number is assigned.

Annotation entries or changes made on one display will appear on *all* the displays. Annotation entries or changes made on one menu will appear on *all* the menus.

If you enter text, for example, on line #2 and subsequently select line #2 again, the text you already entered on line #2 will disappear.

Running the characters or the line number asterisk off the display in either direction can cause problems

You *do not* want to *enable* text entry when performing a digital plot. You can however, perform a digital plot while text entry is already enabled. One thing you will notice though, is the absence of an audio feedback "beep" when you press the PLOTTER, START control. The absence of the "beep" only takes place when plotting in the text entry mode has no effect on plotter operation.

Getting Started

You will find that after you become familiar with the text entry feature, the instructions on the back of the laminated card are all you will need to operate the feature. However, it is advisable to read the following description of the text entry controls to eliminate any unwanted surprises.

When the LED in the upper left-hand corner of this touch control is lit, text entry is enabled and standard front-panel operation of the SD375 is locked out.

When text entry is enabled, annotation changes or entries cannot be made until a line number is assigned. You do this by pressing LINE #, the desired line number on the PARAMETERS group keypad, and then ENT. An asterisk will appear at the beginning of the assigned line number.

Each time you press the SPACE control, the asterisk will move one character space to the right. As the asterisk passes over annotation generated by the instrument, that annotation will be erased (this is not a permanent condition; clearing user-entered annotation causes instrument generated annotation to reappear).

This control does the same thing as the SPACE control, (moves the asterisk one character space to the right) *except*, instrument generated annotation is not erased.

This control is used to transfer a line of *user* entered text (doesn't work for instrument generated annotation) from one line to another. Here's how it's done: First, make sure text entry is enabled (LED lit). Press XFR. Press LINE#. Press the numerical value of the line where text is originally positioned. Press ENT. Press LINE #. Press the numerical value of the line where you want the text transferred. Press ENT. You're all set.

To remove user-entered text, you can use either of two methods. One method is to remove one line at a time. You can do this by first making sure text entry is enabled. Next, press LINE #, the number of the line you want removed, then CLR. The second method is "panic erase", in case you've written something naughty on the display and you have to erase it in a hurry. This is how you do it. If text entry is already enabled, toggle the TEXT control (turn it off, then on), then press CLR. If text entry is not enabled, just turn it on and press CLR. This method erases *all* user entered text

This control is the final command for assigning or transferring a line number.

Pressing this touch control with Text entry enabled (LED lit) recalls the last user entered text (except on lines you are presently entering text), even after it was cleared.

Line Number Locations — Where Are They?

Menu Mode

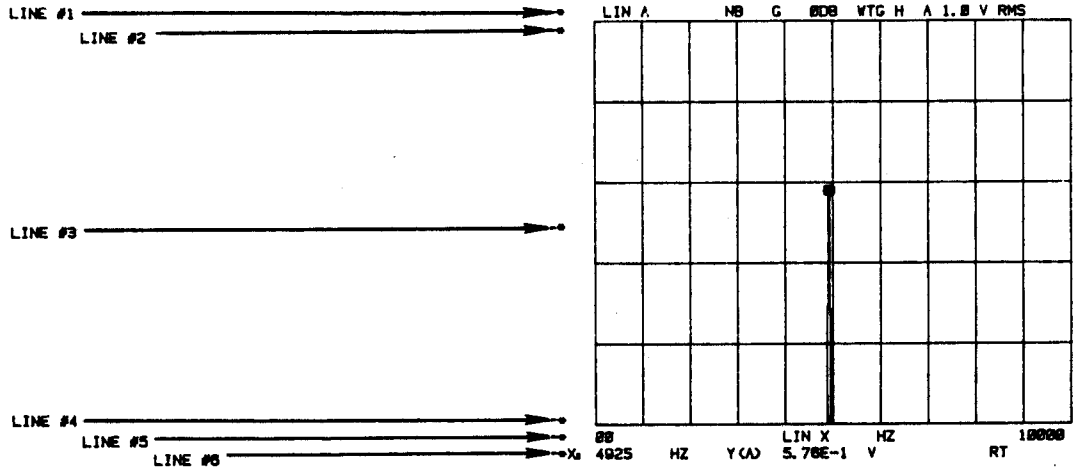
There are 15 lines available for text entry on all the menus. The menu titles on all the menus start on line 1. The first menu item on all the menus appears on line 3. An example of the line number locations for text entry in the menu mode are shown in Figure 3-39.

Display Mode

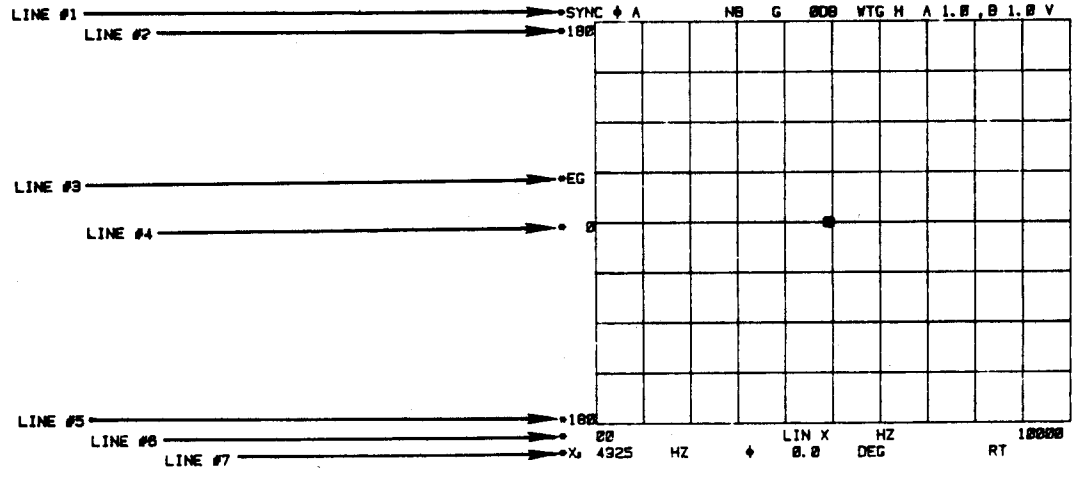
The number of lines available, and their locations, varies with the type of display and Y axis distribution. Single trace displays have 6 or 7 lines available, depending on the function selected (SPECT, TF, POWER TIME and STAT) and Y axis distribution (LIN or LOG). Dual trace displays have 11, 12 or 13 lines available, depending upon the type of dual trace and, also, the function selected and Y axis distribution. Some examples of line number locations for each display variation are also shown in Figure 3-39.

LINE #1		SPECTRUM MENU
LINE #2		
LINE #3	* 1.	SPECT A & B
LINE #4	2.	GAA & GBB
LINE #5	3.	RATIO
LINE #6	4.	SPECT B-A
LINE #7	5.	GBB - GAA
LINE #8	6.	SPECT B+A
LINE #9	7.	GBB + GAA
LINE #10	8.	SPECT A & ZOOM A
LINE #11	9.	SPECT B & ZOOM B
LINE #12	10	SYNC SPECT A & B
LINE #13	11	SYNC SPECT A & ϕ
LINE #14	12	SYNC SPECT B/A & ϕ
LINE #15	13	EQUALIZED RATIO

Menu Example With Line Number Locations

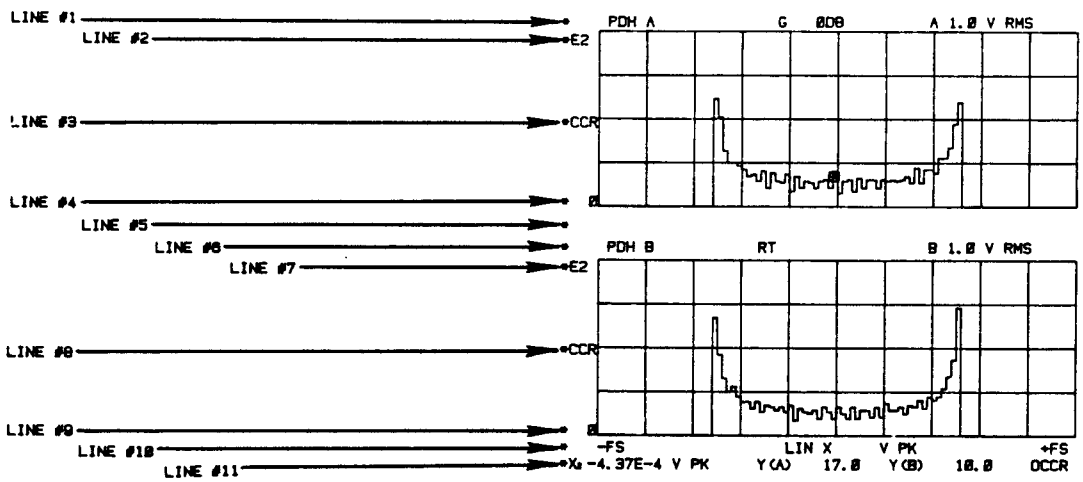


Single Trace — Six Lines

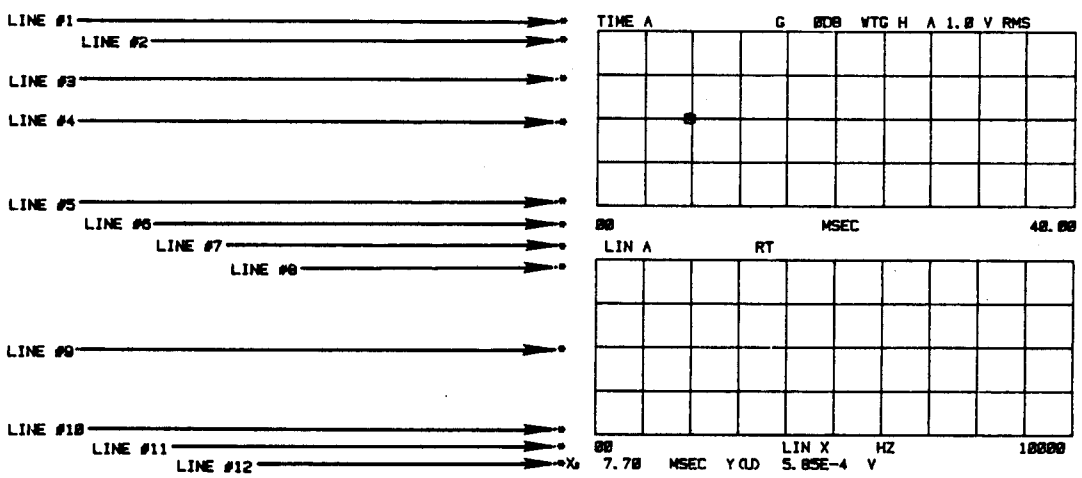


Single Trace — Seven Lines

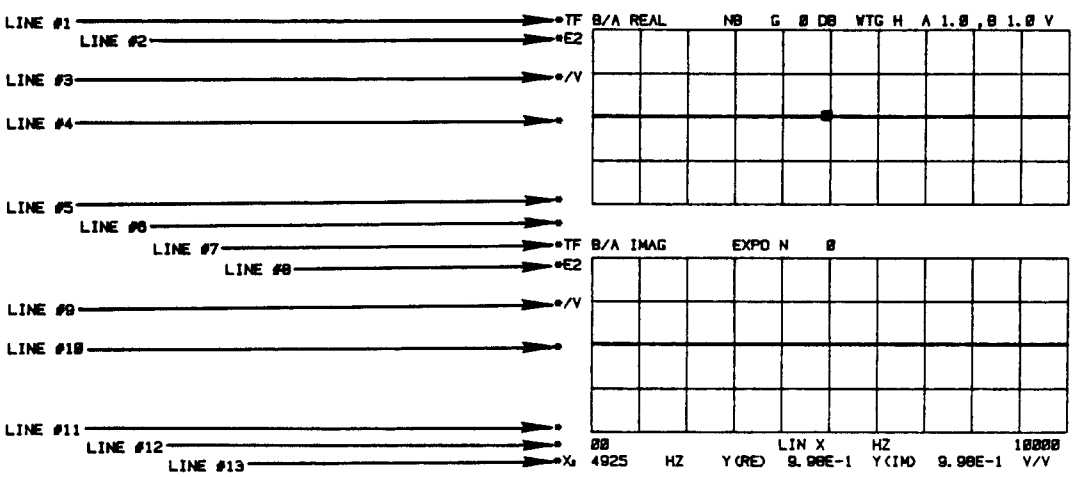
Figure 3-39. Text Entry Line Number Locations



Dual Trace — Eleven Lines

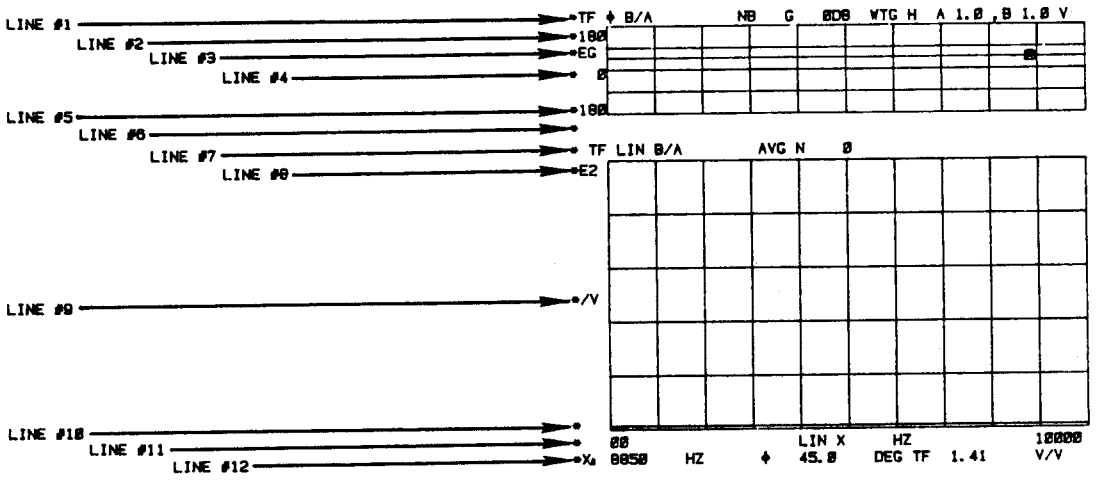


Dual Trace — Twelve Lines

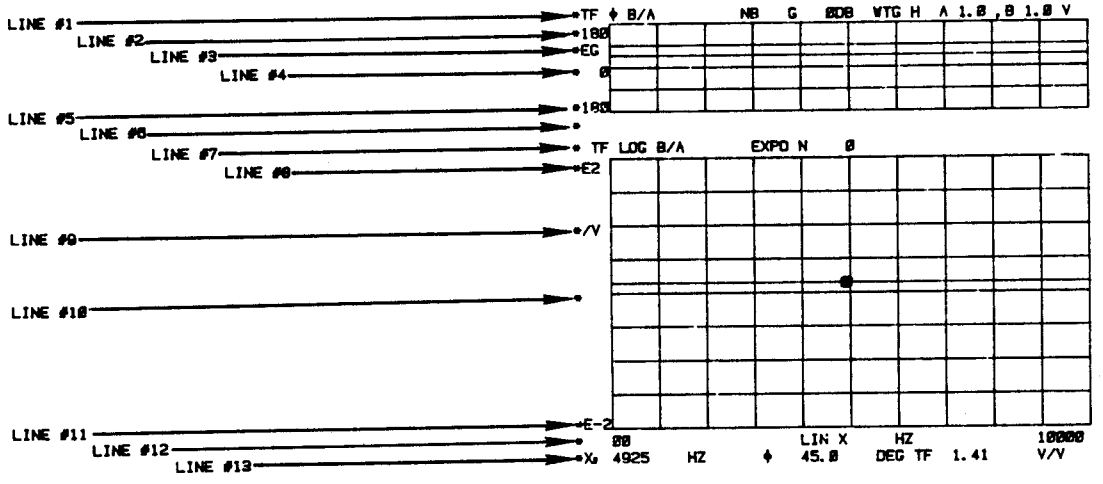


Dual Trace — Thirteen Lines

Figure 3-39. Text Entry Line Number Locations (Continued)



Scroll Dual — Twelve Lines



Scroll Dual — Thirteen Lines

Figure 3-39. Text Entry Line Number Locations (Continued)