

LAB #1 Basic General Search

Scenario: There is a 3314A function generator in the room transmitting a sweeping signal centered on some frequency between 2 MHz and 20 MHz. We will use the process of searching for this signal to learn about the basic functionality of the E3238S signals development system.

Turn-on: The lab systems are configured the same as our demo systems. Turn on the system as follows.

- Power up the VXI mainframe, monitor, and tuner.
- At "Is the date...." press [enter]. HP-UX will now take some time to get everything set, wait for it.
- At "Console Login:" type: "hp3587s [enter]", at "Password" type "lsid [enter]"
- At ">>" type: "x11start" to start X windows. Wait for X windows to start up
- An icon labeled "Console" will appear. Put the cursor on the icon and click the right mouse button to open it.
- Put the cursor in the window and type: "e3238s [enter]". This starts the E3238S application software. The E3238S copyright and start-up screen will appear. When everything is initialized a spectrum trace will appear.
- Place cursor in the small square in the upper right hand corner of the E3238S window border click the left mouse button to maximize the window.

When first learning a product it sometimes helps to have a set procedure for operating it. Our procedure is: set the search parameters, format the display, select the threshold. This can be modified, or completely ignored, once you are familiar with the product.

1.0 Set the search parameters:

- Select the General Search Setup menu by clicking on: Search, Setup.
- Enter the parameters for the search as follows:

<i>Start Freq</i> 2 MHz	<i>Antenna</i> Antenna 1	<i>Shape Factor</i> 9.0:1
<i>Stop Freq</i> 20 MHz	<i>Attenuation</i> 0 dB	<i>Average Type</i> RMS
	<i>RBW</i> 15 kHz	<i>Averages</i> 4

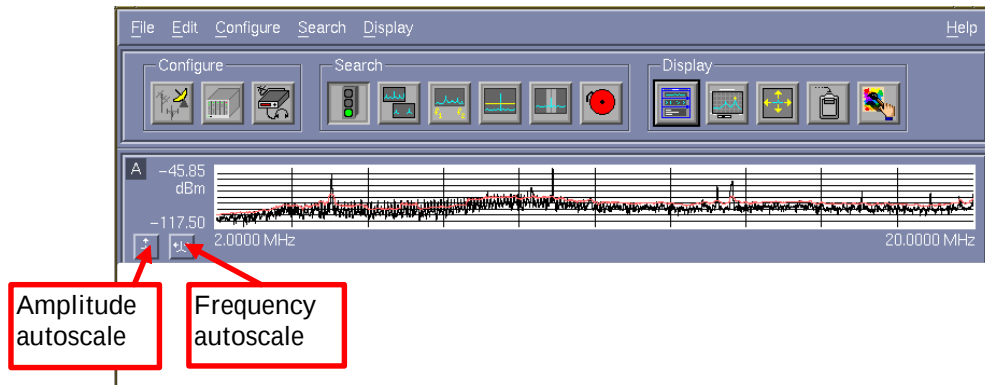
- Click button
- Place cursor in window & type in value,
- Select units
- Select "OK"

- Click button
- Select value from list

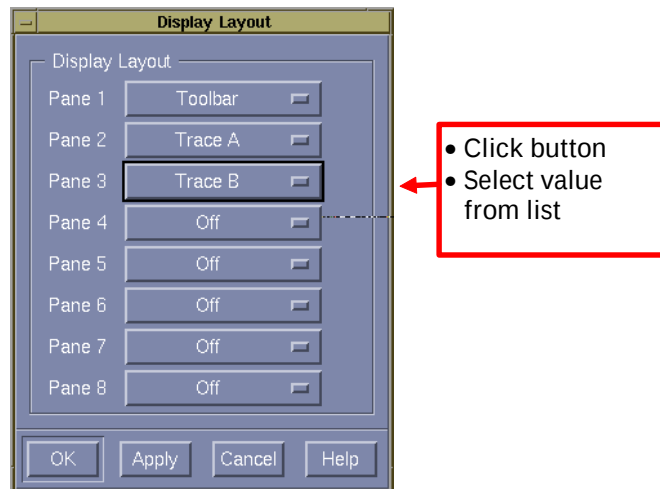
- Click "OK" to activate parameters and close the menu.

2.0 Format the Display

- Autoscale the amplitude and frequency scales of the trace by clicking on the autoscale icons in the lower left corner of the pane.

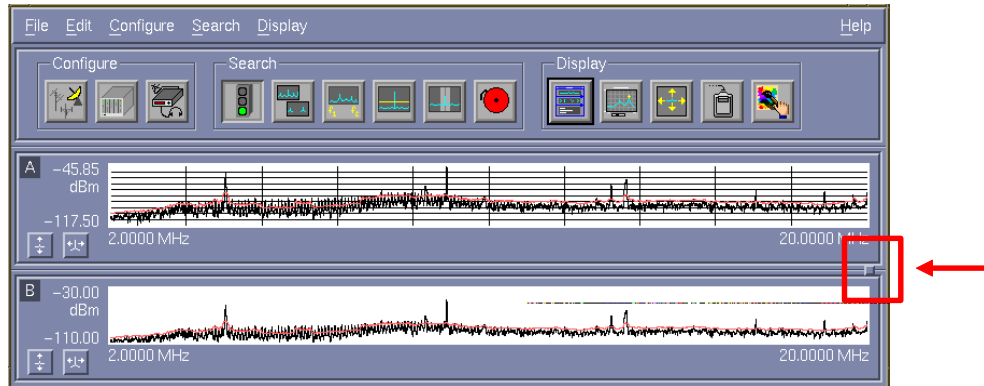


- Add a second trace pane to the display by clicking on: Display, Layout.
- Click the Pane 3 pane button and select trace B from the list.

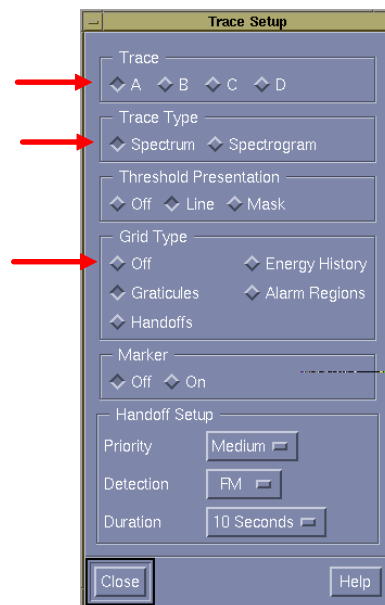


- Click on OK to close the menu and activate the selection.

- Increase the size of pane 3 by placing the cursor on the box in the upper right corner of the trace border, pressing and holding the left mouse button, and dragging the box up.

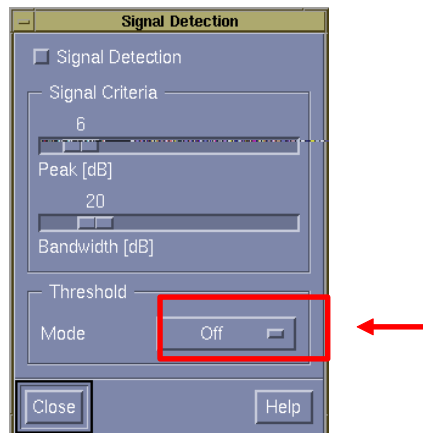


- Autoscale trace B (frequency and amplitude)
- Set trace B trace type to spectrogram by clicking on: Display, Trace.
- In the Trace Setup menu click on Trace B, Spectrogram, Grid Type off (optional but it makes a less cluttered display).
- Click on Close. The B trace will show solid color until a threshold is activated.

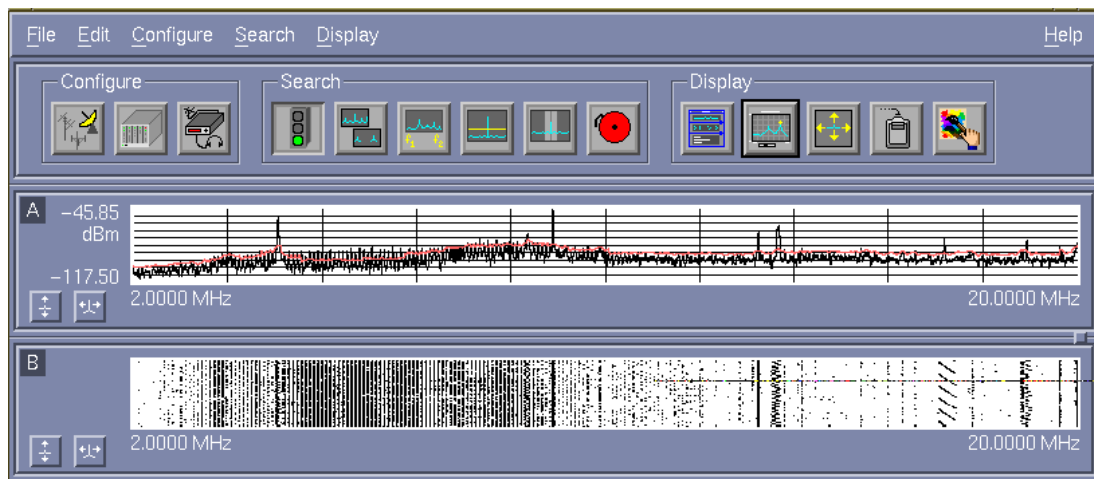


3.0 Select the threshold and signal detection

- To select a threshold click on: Search, Signal Detection.
- Click the threshold mode button and select auto (noise floor following) threshold from the list. The threshold will appear in trace A and the trace B spectrogram display should start showing something.



- The best spectrogram is usually obtained by adjusting the threshold so that it is just above the noise peaks. Do this by putting the cursor on the Threshold Margin (dBm) slider, pressing and holding the left mouse button, and moving the slide left or right. The threshold in trace A will move up and down with the slider.
- Adjust the auto threshold margin level up or down to see more or less signal detail. The menu can be moved if it is blocking too much of the window. Just point at the top border of the menu with the cursor, click and hold the left mouse button and drag the menu out of the way.
- Click on close.



- Using the two displays find the sweeping signal from the 3314.

- In trace A zoom on the signal using the mouse. Put the cursor above and to one side of the signal. Push and hold the right most mouse button. Drag the cursor down and across the signal so that the box that appears brackets the entire signal. Release the mouse to zoom.

The display automatically shows only that portion of the spectrum bracketed by the drag box. Note that the other trace have not zoomed. This allows the operator to keep an eye the rest of the spectrum. You can unzoom by clicking on the frequency autoscale button.

- Use the marker to estimate signal frequency, amplitude and bandwidth. Activate the marker by moving the cursor to the point in the trace you want to measure then press and hold the left mouse button. Then just hold down the left mouse button. The frequency and amplitude of the energy at that point is shown just below the frequency axis.

SIGNAL CENTER FREQUENCY _____

SIGNAL BANDWIDTH _____

SIGNAL AMPLITUDE _____

E3238S features shown in Lab #1:

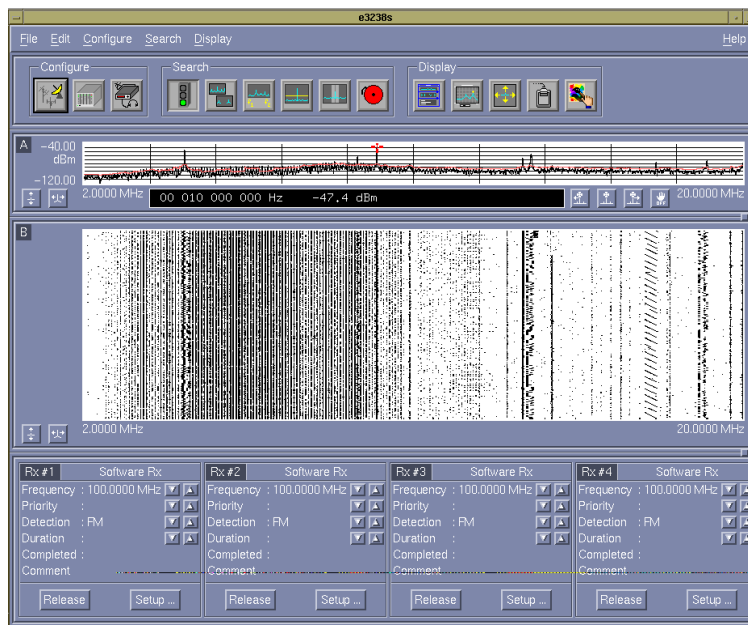
- How to power up the demo system, including login and passwords.
- How to set frequency span, RBW, shape factor, averaging, tuner attenuation and select antennas for General Search.
- How to select and set up display panes.
- How autoscale the amplitude and frequency trace axis'.
- How to set up a spectrogram display.
- How to zoom on a signal.
- How to use the mouse to control markers.
- How to manually assign signals of interest to a hand-off receivers. (optional exercise)

OPTIONAL EXERCISE

4.0 Manually assigning a hand-off receiver to a signal.

- Open the hand-off receivers display pane from the menu bar by clicking on: Display, Layout.
- Click on the Pane 4 button and select Hand-off Receivers from the list.
- Click on OK to close this menu.

The control panels for the four dummy hand-off receivers will be displayed. You can assign signals to these control panels but they will not actually do anything.



- To manually assign a signal to a hand off receiver put the cursor on the signal of interest.
- Press and hold the middle mouse button, the signal frequency will appear and a "telephone plug" icon.
- Drag the cursor to a hand off receiver control panel and release the button. The signal frequency will appear in the control panel.

This process works for both the trace and spectrogram displays.

You can see a list of the signals handed off to the hand-off receivers.

- To activate the hand-off log from the menu bar click on: Display, Layout.
- Click on the pane 5 button and select Hand-off Log.
- Click on OK to close this menu and activate the new pane.

If the Log is too small to see enough entries, re-size the pane, or close another display pane by turning it off in the Display Layout menu.

