

**Automatic VS Manual Features Of The FS74 CHANNELIZER SR.™**

Most of the setups for your FS74 tests are done automatically to speed testing and avoid measurement errors. This allows you to quickly make important tests even under inconvenient circumstances such as times when you are up a pole, in a manhole, or wearing gloves.

When you are testing non-standard signals or wish to make non-standard tests, however, you can also use your FS74 manually. Your FS74 includes both the automatic and the manual tests so you can troubleshoot with maximum efficiency no matter what the test conditions.

This Tech Tip explains how to obtain maximum benefit from your FS74 tests by using both the automatic and manual features of your FS74.

**Testing Signal To Noise Ratio**

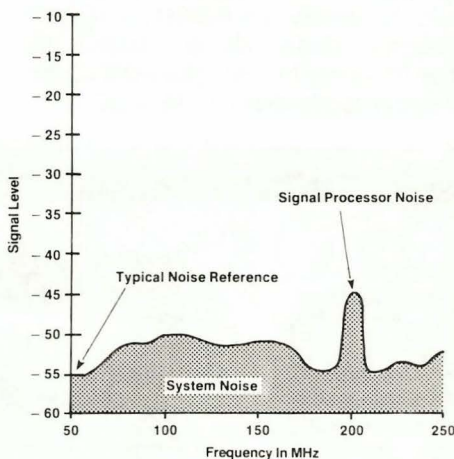
**Automatic**

Your FS74 uses an automatic, patented method of measuring the noise on the same channel that you are testing for S/N, so you get a true, on-channel S/N result. The on-channel S/N ratio may be different than the S/N ratio you measure when using a noise reference at some other frequency. This is because narrowband noise may be present either on the channel you are testing or at the frequency you are using for an off-channel noise reference (Figure 1).

When testing at the subscriber tap, you'll want to do an on-channel S/N test. This automatic test allows you to check your subscriber taps for S/N up to 46 dB on individual channels in order to get the best indication of the signal quality that your customer will see on a particular channel.

To do an automatic on-channel S/N test with your FS74:

a. Set the FUNCTION switch to the RF VIDEO position and tune to the desired channel.



**Fig. 1: System noise varies throughout the band. Your FS74 allows you to measure the noise on an in-use channel and locate bad S/N levels that would be missed without a true, on-channel S/N test.**

b. Reset the FUNCTION SWITCH to the NOISE REF position, check that the tuning is still on your desired channel, and push the NOISE REF STORE button after the reading has settled.

c. Move the FUNCTION switch to the S/N position and read the true, on-channel S/N reading on the meter (Figure 2).

**Manual**

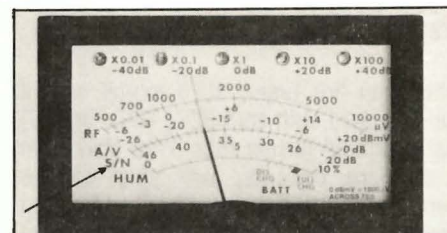
You can also manually tune your FS74 for an off-channel noise reference to test for system noise levels on the trunk and feeder lines when the expected S/N ratio is greater than 46 dB. With your FS74 you can manually sample the noise on an empty channel, such as the channel below your lowest channel or above your highest channel. You can use your FS74 off-channel test results to check the broadband system noise, exclusive of individual channel processor noise or signal source noise.

To do a manual off-channel S/N test with your FS74:

a. Set the FUNCTION switch to the RF VIDEO position and tune to the desired channel. Note the RF signal level.

b. Retune to the empty channel you wish to use for your noise reference (use the FREQUENCY OFFSET control to tune up 2 MHz if there is a carrier present). Note the measured noise level and add 13 dB to compensate to a 4 MHz noise sample bandwidth.

c. Calculate the difference between the signal level and the compensated noise level.



**Fig. 2: To measure S/N, set the function switch to NOISE REF and tune to the desired reference (a). Push the NOISE REF STORE button to store the noise level (b). Set the FUNCTION switch to S/N and read the ratio on the meter scale (c).**

*Example: An RF signal level of +25 dBmV and a measured noise level of -43 dBmV would give the following:*

-43 dBmV measured noise + 13 dB = -30 dBmV compensated noise level  
 (+25 dBmV signal level) - (-30 dBmV compensated noise level) = 55 dB S/N Ratio

## Tuning Standard And Non-Standard Signals

Your FS74 has both automatic and manual features that make it easy for you to tune signals that aren't exactly on the FCC assigned channel frequencies. Automatic Fine Tuning (AFT) on your FS74 has an automatic search range of +/-1.25 MHz. Your FS74's HRC and ICC tuning features automatically offset to match the standard HRC and ICC cable shift schemes. Plus, the manual FREQUENCY OFFSET control allows you to manually offset a channel by plus or minus 4 MHz to tune non-standard shifts or to search for interfering signals.

### Automatic

When tuning signals that follow the standard FCC channel frequencies or the standard HRC or ICC cable shifts, simply set your FS74's CABLE SYSTEM switch to FCC, HRC, or ICC and set the TV CH SELECT knob to your desired channel. Your FS74 automatically shifts its tuning to follow these standard channel frequency schemes.

When tuning to a signal with a non-standard shift (not FCC, HRC, or ICC) that is shifted less than 1.25 MHz from a standard channel, turn on your FS74's AFT by pulling out the FREQUENCY OFFSET knob. You'll see the signal level peak as your FS74 automatically tunes to the shifted signal. The digital FREQ OFFSET display indicates how far the signal is offset from the standard channel frequency.

### Manual

When you are tuning to a signal with a non-standard shift (not FCC, HRC, or ICC) that is shifted further than 1.25 MHz from a standard channel, use your FS74's manual FREQUENCY OFFSET control to manually offset a standard channel to match the frequency of your non-standard signal (or simply adjust the FREQUENCY OFFSET control for a maximum reading on the meter). The Frequency Allocation chart located on your FS74's Pull Chart and in the appendix of your FS74 manual will help

you determine how far your signal is offset from a standard channel.

The offset tuning of your FS74 also allows you to identify and measure interfering signals by manually tuning above and below the main carrier frequency. This works best if you first remove modulation from the channel to avoid confusion with the channel's normal modulation. To tune to an interfering signal, rotate the FREQUENCY OFFSET knob to tune above or below the channel carrier. The tuning bandwidth of your FS74 is 200 kHz, so you can easily tune to individual interfering signals as you watch the signal meter for a peak. To identify the interfering signal's frequency, simply add or subtract the offset frequency from the channel's carrier frequency as shown in the pull chart.



**Fig. 3: Your FS74 wideband monitor is designed to make it easier for you to identify and troubleshoot signal quality problems by showing even the finest detailed noise and interference.**

## Using Your Wideband Troubleshooting Monitor and Meter

Your FS74's monitor and meter are both controlled by the same automatic and manual tuning and range controls. You should use the monitor and meter separately, however, to obtain the maximum benefit from each of them.

Your FS74 monitor is a 4 MHz wideband troubleshooting monitor especially designed to help you track down interference problems such as adjacent or co-channel beats, ingress, or ghosting. It's not meant to be a TV. The wideband monitor speeds troubleshooting by showing you the finest detailed noise and interference (Figure 3).

## Automatic

When a customer's complaint alerts you to a ghosting or interference problem, use your monitor to quickly track the problem to its source. Ignore the meter and use AUTO range to select the range that best shows the interference in the picture.

You should evaluate the noisiness of the signal, however, by using the automatic S/N ratio meter test, not by looking at the monitor.

## Manual

When you are making signal level adjustments or watching for signal level changes, use RANGE SELECT to manually switch to the range that shows your signal

level change the best. This prevents the meter from automatically switching ranges in the middle of an adjustment.

Manual range selection tends to cause normal signals to either look weak or overload on the monitor.

**For More Information,  
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