SNG-2500C User's Guide

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GENERAL SAFETY

If one or more components of your earth station are connected to 120 volt AC line current, it is important that you ground all components of your system, particularly the antenna, to reduce the possibility of dangerous electrical shock. When using instruments such as the SNG-2500C, power hand tools, and any other appliance connected to an electrical outlet, exercise great care to ensure that the device is grounded effectively to avoid electrical shock. Do not use while standing in water, on damp earth, or while in personal contact with a conducting surface such as a metal ladder or chair.

Also:

- Use a properly grounded electrical outlet or extension cord.
- Do not cut the grounding pin from the line cord plug.
- Ensure the antenna and other components of your earth station are properly grounded.
- Do not open the case - the warranty will be voided by doing so. No user-servicable parts are inside.

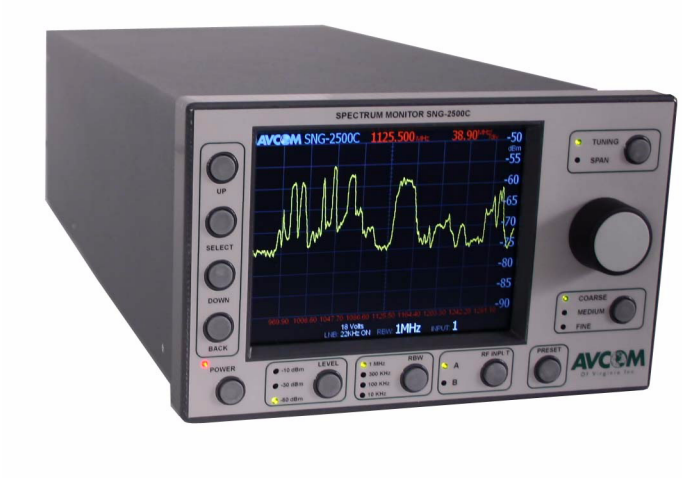
IMPORTANT CAUTIONS

- Do not couple the input of the SNG-2500C to high power RF sources such as walkie talkies, CB radios, transmitters, etc. Signal levels in excess of +15 dBm can damage the sensitive mixers in the instrument resulting in otherwise unnecessary expense and repairs. Use only the external DC power supply included with the unit.
- Handle with care. The SNG-2500C Spectrum Analyzer is a precision instrument designed for normal operating and handling conditions. It should be protected from abuse such as dropping, throwing, and other rough handling. When being transported in a vehicle, or shipped, the SNG-2500C must be cushioned and protected against shock and vibration.

1

OVERVIEW

The SNG-2500C is Avcom's answer to the discontinued Tektronix 1705A with a feature set that gives the Satellite Technician a very useful tool for finding and peaking on satellites. The SNG-2500C is not only a spectrum analyzer, but also a carrier monitor (that can simultaneously monitor up to six RF inputs), with features such as carrier masking and screen shot capture and recording. When used with the Avcom Graphical User Interface (GUI), the SNG-2500C also offers Satellite ID and Automated Data Acquisition (DAQ) with tolerance comparison and integrated e-mail alerts. The SNG-2500C also offers L.O. Frequency Offset which enables you to display the frequency in L-Band, C-Band, X-Band, Ku-Band, or any custom band needed.



IMPROVED PERFORMANCE & SPECIFICATIONS

The new SNG-2500C was designed with excellent frequency and amplitude accuracy as well as a wide variety of resolution bandwidth selections ranging from 10kHz to 1MHz. These features enable you to view and monitor small TT&C and data carriers found in many satellite communications markets today. The front panel provides independent control of Frequency & Span (with settings for Fine, Medium and Coarse), enabling you to dial into the carrier and control the display as needed.

VERSATILE GRAPHICAL USER INTERFACE

The SNG-2500C can be monitored and controlled both locally from the front panel with the color LCD or remotely using the Avcom Graphical User Interface (GUI). Connecting via either the serial port or Ethernet port, the remote GUI enables remote monitoring and control from anywhere in the world via the Internet. If the SNG-2500C is used in a SNG truck with a high speed cellular broadband card, an inexperienced operator can get assistance (in the form of remote monitoring and control) from anywhere in the world.

FEATURES

- High Resolution Full VGA Color Display
- Fits into Tektronix 1700 Series Dual Mount tub designed for satellite news gathering market
- Dual Wideband Switched Inputs; 4 and 6 inputs available
- DSP Technology enables refresh rates up to 13/sec
- Digital Tuning for Excellent Frequency Accuracy
- 4 Resolution Bandwidth Selections
- Ethernet & Serial Communications for Full Remote Control Capability
- User Friendly and Intuitive GUI

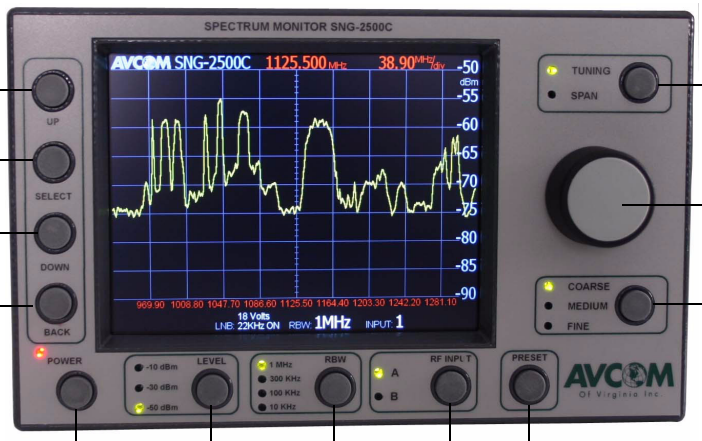
2

HARDWARE

This chapter explains how to use the controls on the front panel and the connectors on the back panel.

THE FRONT PANEL

Take a few moments to familiarize yourself with the front panel of the SNG-2500C:



The following table explains each of the front panel controls:

Control	Description
<UP> Button	Scrolls the highlighting up through whatever menu is currently displayed. If it is already at the top, the highlighting wraps to the bottom of the menu. This button is also used for toggling various menu options.
<SELECT> Button	Selects the menu option that is currently highlighted. If no menu is displayed, press the **<SELECT>** Button to display a menu.
<DOWN> Button	Scrolls the highlighting down through whatever menu is currently displayed. If it is already at the bottom, the highlighting wraps to the top of the menu. This button is also used for toggling various menu options.
<BACK> Button	Returns to the previously displayed menu. You can think of the **<BACK>** Button as the opposite of the **<SELECT>** Button.
<POWER> Button and indicator light	Press the **<POWER>** Button to apply power to the SNG-2500C. Press it again to remove power. (If you can not power the SNG-2500C down, hold the **<POWER>** button in for 10 seconds and it will shut down.) The red indicator light is lit whenever the SNG-2500C has power.
<REFERENCE LEVEL> Button and indicator lights	Press the **<REFERENCE LEVEL>** Button to change the reference level. The indicator lights show the new reference level. If the reference level is too high, your signal could be too strong to measure. If the reference level is too low, your signal might not be visible at all.
<RBW> (Resolution Bandwidth) Button and indicator lights	Press the **<RBW>** Button to change the resolution bandwidth. The indicator lights show the new RBW. Using the proper resolution bandwidth makes it easier for you to see smaller or larger signals.
<RF INPUT> Button and indicator lights	Press the **<RF INPUT>** Button to change to a different RF input. The indicator lights show which RF input is being monitored.
<PRESET> Button	When you have discovered the best settings for a particular signal, you can save those settings as a preset. By saving the settings for each signal that you monitor, you can create a library of presets. Press the **<PRESET>** button to cycle through the presets.

Control	Description
<SENSITIVITY> Button	The **<SENSITIVITY>** Button controls the resolution of the **<ROTARY ENCODER>**. A coarse resolution enables you to make big changes quickly, while a finer resolution enables you to make small adjustments precisely. The indicator lights show which resolution is in effect.
<ROTARY ENCODER>	Rotate the **<ROTARY ENCODER>** to change the frequency or the span of frequencies being monitored. The function of the **<ROTARY ENCODER>** is determined by the **<RBW>** Button and the **<TUNING/SPAN>** Button.
<TUNING/SPAN> Button	The **<TUNING/SPAN>** button determines whether the **<ROTARY ENCODER>** changes the frequency or the span of frequencies being monitored. The indicator lights show which function is in effect.

THE BACK PANEL

There are no controls on the back panel, but connections for power, signal, and remote control are made here.

Connector	Description
RF Input	The signal to be monitored and/or analyzed comes in here. Your system might have more than one RF Input. In that case, you can switch between them from the front panel.
Ethernet Port	Use this port to connect to the internet. A computer located anywhere in the world can then use the Avcom Graphical User Interface (GUI) to monitor and control the SNG-2500C. You can also use this port to connect to a computer that is physically close to you.
RS-232 (Serial) Port	Use this port to connect to a computer that is physically close to you. The computer can then use the Avcom Graphical User Interface (GUI) to monitor and control the SNG-2500C.
Power Input	Connect the 15 volt DC, 3 amp capacity power supply provided by Avcom to this port. The unit will not perform correctly with a substitute.

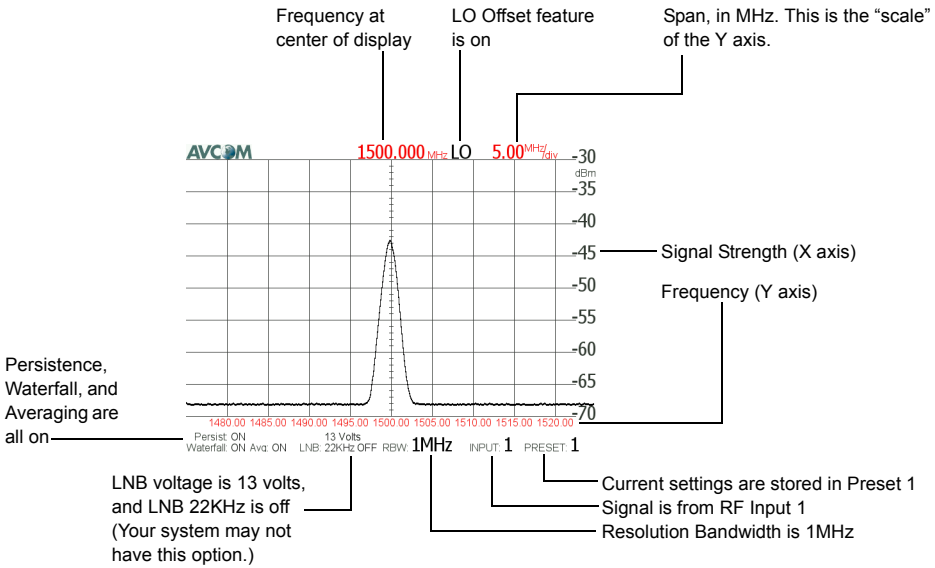
3

USING THE SNG-2500C

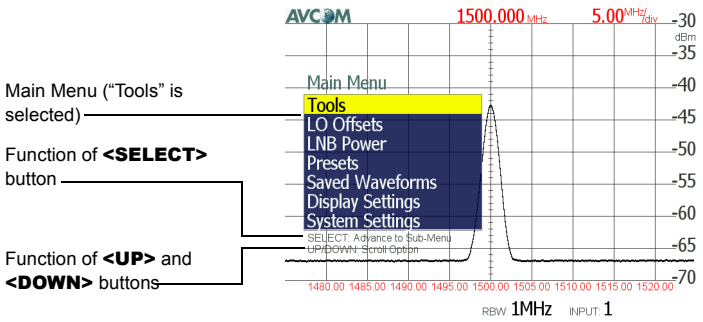
To avoid the need for a large and complicated front panel, the SNG-2500C uses a system of menus and sub-menus to provide access to most of its features. You can navigate this menu system by using the column of buttons above the **<POWER>** button. Each of these buttons is described in detail in Chapter 1.

THE DISPLAY SCREEN

Below is an example of what the screen might look like:



Here is an example of what a menu looks like:



This chapter assumes that you know how to get into each menu and make selections, and now you need to know what each menu option does.

THE TOOLS MENU

The Tools Menu contains tools that enable you to customize the appearance of the waveform on the screen.

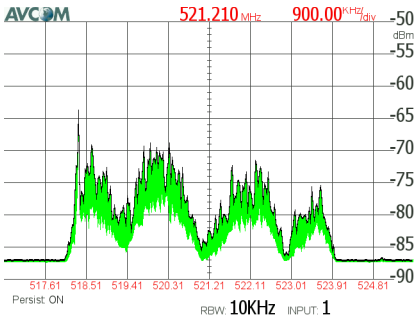
Tool	Description
Average	Averaging is a noise reduction feature that smooths out the appearance of the waveform. Instead of displaying the exact values of the signal strength, which are constantly changing, it displays an average of the most recent values. You can specify how many values are averaged. The higher you set this parameter, the smoother the display will be.
Persistence	Persistence is a feature that enables you to see where a waveform has been in the recent past. For example, if a signal drops sharply, you could see the drop for a period of time after it has returned to normal. By changing the Mode, you can customize this feature to show minimum levels, maximum levels, or both. You can also specify the time (measured in frames) the persistent waveform is displayed.

Tool	Description
Waterfall	Waterfall is another feature that enables you to see where a waveform has been in the recent past. It does this by scrolling the old waveforms up and to the right, creating a three-dimensional view of how the waveform has changed over time.
2dB / Div Scale	This feature provides a close-up view of the waveform by changing the scale shown on the right side of the display. In 2dB mode, each horizontal line on the display represents a change of 2dB instead of the usual 5dB.

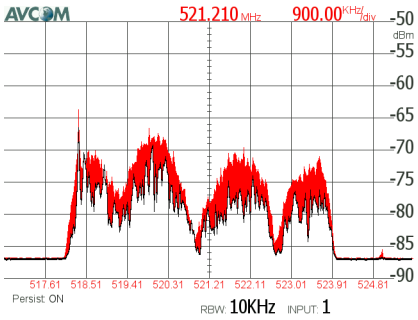
Persistence

The screen captures below illustrate the concept of persistence.

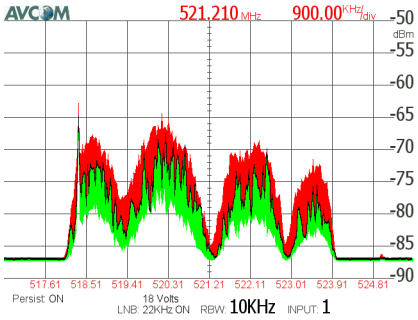
In the first example, the *minimum* level is being shown. The green area below the waveform is the lowest level the waveform has reached.



In the next example, the *maximum* level is being shown. The red area above the waveform is the highest level the waveform has reached.

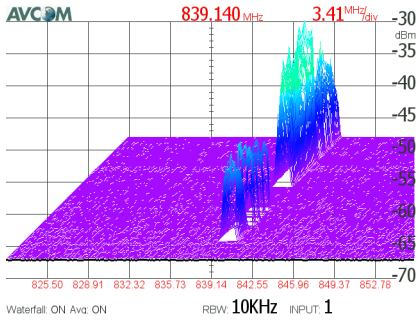


In the final example, *both* the minimum and maximum levels are being shown. The green area below the waveform is the lowest level the waveform has reached, and the red area above the waveform is the highest level the waveform has reached.

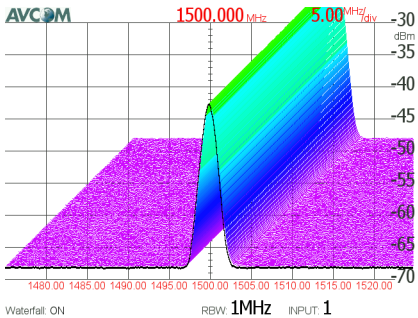


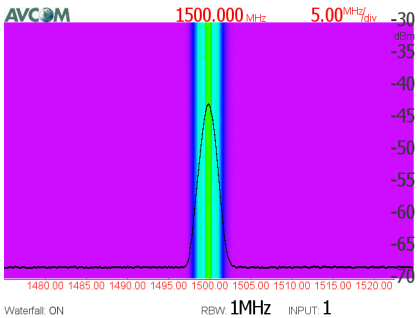
Waterfall

Below is an example of the waterfall display:



The 2D waterfall option shows the waterfall display as it would appear if you were looking down from above:





THE LO OFFSETS MENU

The LO Offsets Menu enables you to select several options for the LO (Local Oscillator) offsets.

Option	Description
Turn on -5.150GHz Turn off -5.150GHz	By pressing the **<SELECT>** button, you can toggle the LO Offset on and off. The frequency shown on the display changes accordingly.
Select Offset	Selecting this option displays the Select Offset Menu. The offset you select from this menu is toggled on and off by the first menu option. For example, if you select the offset "User1 LO=7.500GHz", the first option in the LO Offsets Menu will become "Turn on 7.500GHz".
Change User1 LO Change User2 LO	If none of the offsets listed in the Select Offset Menu are suitable, you can define two custom offsets. Select either "Change User1 LO" or "Change User2 LO", then use the **<UP>** and **<DOWN>** buttons to change the offset frequency as needed.

THE LNB POWER MENU (OPTIONAL)

The LNB Power Menu enables you to configure the power settings for the LNB inputs. (LNB may be on any input, if your system was ordered that way.) The menu below is repeated for each LNB input in your system.

Option	Description
LNB Input 1 LNB Input 2	Press the **<SELECT>** button to switch the LNB input on or off.
LNB Voltage	Press the **<SELECT>** button to toggle between 13 and 18 volts.
LNB 22KHz	Press the **<SELECT>** button to toggle between on and off.

THE PRESETS MENU

When you have the display looking the way you want it, you can save the settings to a preset location in memory. If you need to change the settings to monitor a different signal, you can change them back by recalling the preset. The settings saved by this function are:

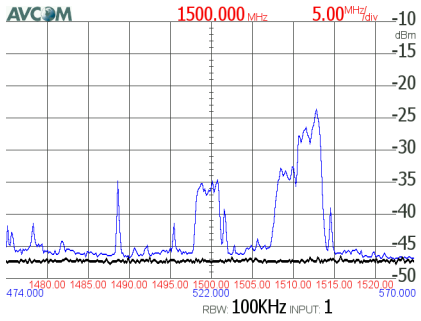
- Center Frequency
- Span
- LO Offset
- LNB (if present)
- RF Input
- RBW
- Reference Level

Option	Description
Save Preset	Press the **<SELECT>** button to save the current settings as Preset 1. If you do not want to erase the settings in Preset 1, press the **<UP>** or **<DOWN>** buttons until you find a preset that is acceptable.
Set Max Presets	Use the **<UP>** and **<DOWN>** buttons to change the maximum number of presets. If you set this parameter to match the number of presets that you use, you never have to scroll past any unused presets.
Delete Single	Use this option to delete the settings stored in a preset location.
Delete All	Use this option to delete the settings stored in *all* preset locations.

THE SAVED WAVEFORMS MENU

The options on the Saved Waveforms Menu enable you to freeze a waveform on the screen and simultaneously save it to a memory location for later display. There are fifty memory locations available for this purpose.

Here is an example of a saved waveform. The blue line is the saved waveform, and the black line is the waveform currently being monitored.



Use this option...	To...
Save To	freeze a waveform on the screen and simultaneously save it to a memory location.
Load From	recall a waveform from a memory location and display it.
Clear Screen	clear a frozen waveform from the screen.
Delete Single	delete a waveform from memory.
Delete All	delete *all* waveforms from memory.

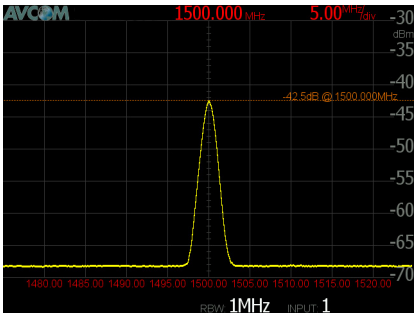
THE DISPLAY SETTINGS MENU

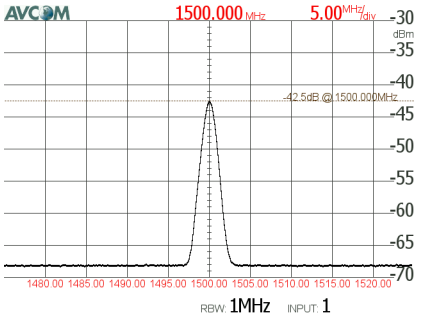
The options on the Display Settings Menu enable you to adjust the appearance of the display to your liking.

Use this option...	To...
Brightness	select one of five levels of screen brightness.
Video Flip	invert the screen colors.
Ride Peak Line	display a line showing the peak level (the strongest signal currently visible). This line changes continuously as the peak level changes. You can also show or hide the legend for the peak line. The legend moves with the peak line and shows the signal strength and frequency of the peak.
Disp Ref Level	show or hide the signal strength numbers on the right side of the display.
Display Graph	show or hide the vertical and horizontal lines behind the waveform.
Display Date/Time	show or hide the date and time in the lower left corner of the display.

Video Flip

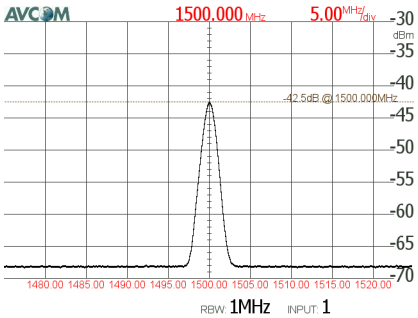
Below is an example of how the screen looks before and after the Video Flip function.





Ride Peak Line

Below is an example of the Ride Peak Line feature.



THE SYSTEM SETTINGS MENU

The options on the System Settings Menu enable you to change the system settings.

Option	Description
Bit Resolution	Bit Resolution toggles between 8-bit or 12-bit amplitude resolution.
Unit dB / dBmV	This option toggles between dBm and dBmV.
Set Date / Time	Use this option to set the system date and time.
Rotary Encoder Function	The Rotary Encoder Function determines what happens when you press the **<ROTARY ENCODER>**. It is disabled by default, but you can program it to duplicate the function of the **<TUNING/SPAN>** Button or the **<SENSITIVITY>** Button.
Auto Hide Menu	When this option is off, a menu displayed on the screen remains on the screen until you exit from the menu system by pressing the **<BACK>** button. When this option is on, the menu disappears after a few seconds. To bring it back, press any of the Menu Buttons.
System Info	This option displays information about the system.

4

SPECIFICATIONS

Specifications are based on Avcom control system and graphical user interface and may vary depending on the control system used. Please contact Avcom for specifications based on the selected platform. Specifications are subject to change.

TECHNICAL SPECIFICATIONS

Frequency Coverage:	5 - 2500 MHz
Span Width:	0 - 1300 MHz
Resolution Bandwidth:	10kHz, 100kHz, 300kHz, 1MHz
RF Sensitivity:	Greater than - 85 dBm Typical
Reference Levels:	Selectable - 10, -30 & - 50 dBm
Scale:	5 dB/Div & 2dB/Div
Dynamic Range:	40 dB on Application Window
Amplitude Accuracy:	+/- 1 dB typical
Frequency Accuracy:	+/- 1kHz typical
Input Connector:	“BNC” Type (others available)
Size:	Width, Height, Depth 8.0” X 4.75” X 16.5”
Weight:	5 Lbs.
Power Requirements:	+15 Volts DC, 3 Amps
Display:	Full VGA Color LCD
Input Option:	2 standard, 4 or 6 optional
Connector Option:	BNC is standard; F, N, SMA, TNC are optional

INDEX