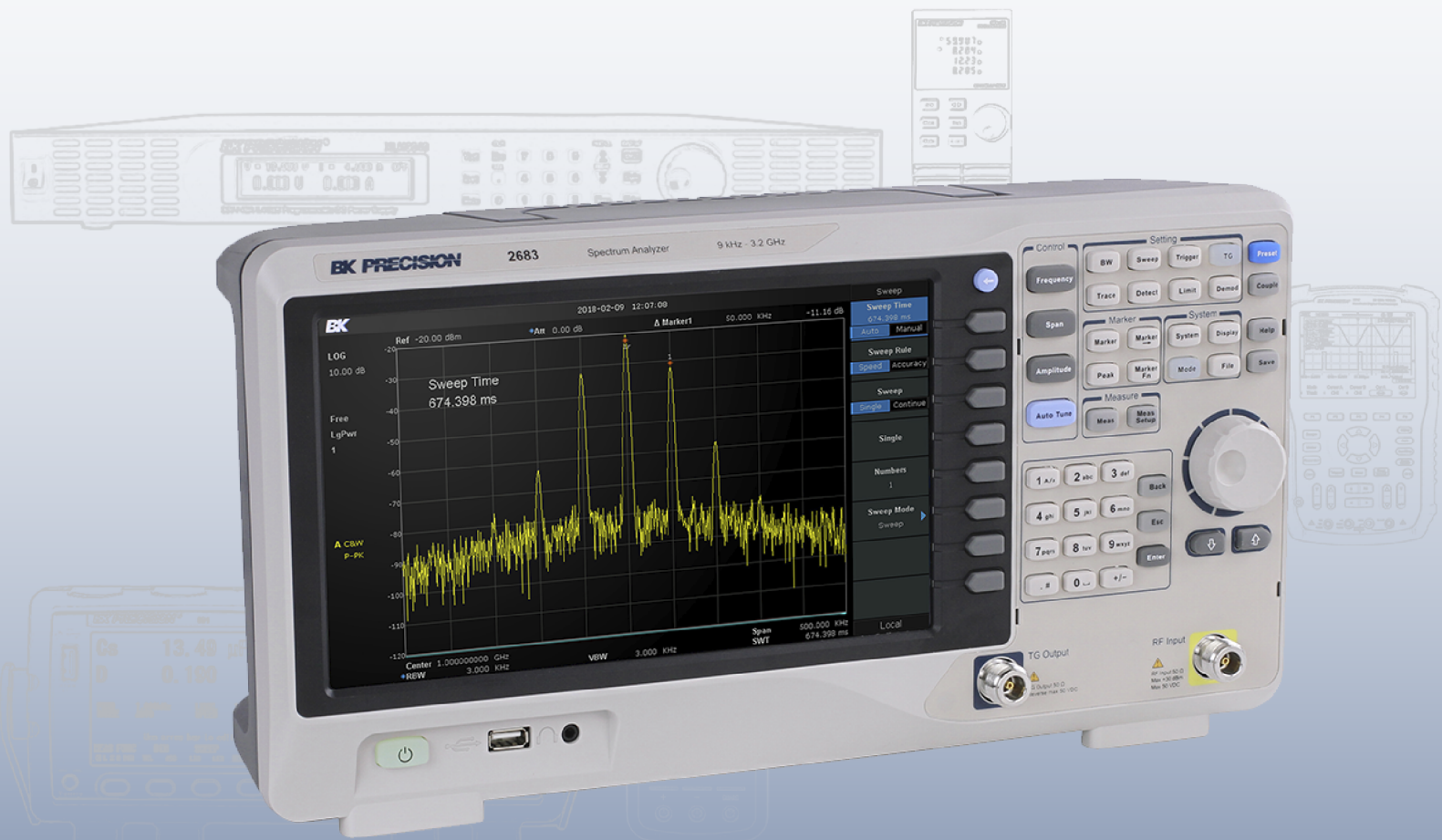


User Manual

2680 Series - Spectrum Analyzers



Safety Summary

The following safety precautions apply to both operating and maintenance personnel and must be followed during all phases of operation, service, and repair of this instrument.

WARNING

Before applying power to this instrument:

- Read and understand the safety and operational information in this manual.
- Apply all the listed safety precautions.
- Verify that the voltage selector at the line power cord input is set to the correct line voltage. Operating the instrument at an incorrect line voltage will void the warranty.
- Make all connections to the instrument before applying power.
- Do not operate the instrument in ways not specified by this manual or by B&K Precision.

Failure to comply with these precautions or with warnings elsewhere in this manual violates the safety standards of design, manufacture, and intended use of the instrument. B&K Precision assumes no liability for a customer's failure to comply with these requirements.

Category rating

The IEC 61010 standard defines safety category ratings that specify the amount of electrical energy available and the voltage impulses that may occur on electrical conductors associated with these category ratings. The category rating is a Roman numeral of I, II, III, or IV. This rating is also accompanied by a maximum voltage of the circuit to be tested, which defines the voltage impulses expected and required insulation clearances. These categories are:

Category I (CAT I): Measurement instruments whose measurement inputs are not intended to be connected to the mains supply. The voltages in the environment are typically derived from a limited-energy transformer or a battery.

Category II (CAT II): Measurement instruments whose measurement inputs are meant to be connected to the mains supply at a standard wall outlet or similar sources. Example measurement environments are portable tools and household appliances.

Category III (CAT III): Measurement instruments whose measurement inputs are meant to be connected to the mains installation of a building. Examples are measurements inside a building's circuit breaker panel or the wiring of permanently-installed motors.

Category IV (CAT IV): Measurement instruments whose measurement inputs are meant to be connected to the primary power entering a building or other outdoor wiring.

WARNING

Do not use this instrument in an electrical environment with a higher category rating than what is specified in this manual for this instrument.

WARNING

You must ensure that each accessory you use with this instrument has a category rating equal to or higher than the instrument's category rating to maintain the instrument's category rating. Failure to do so will lower the category rating of the measuring system.

Electrical Power

This instrument is intended to be powered from a CATEGORY II mains power environment. The mains power should be 115 V RMS or 230 V RMS. Use only the power cord supplied with the instrument and ensure it is appropriate for your country of use.

Ground the Instrument

WARNING

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical safety ground. This instrument is grounded through the ground conductor of the supplied, three-conductor AC line power cable. The power cable must be plugged into an approved three-conductor electrical outlet. The power jack and mating plug of the power cable meet IEC safety standards.

WARNING

Do not alter or defeat the ground connection. Without the safety ground connection, all accessible conductive parts (including control knobs) may provide an electric shock. Failure to use a properly-grounded approved outlet and the recommended three-conductor AC line power cable may result in injury or death.

WARNING

Unless otherwise stated, a ground connection on the instrument's front or rear panel is for a reference of potential only and is not to be used as a safety ground. Do not operate in an explosive or flammable atmosphere.

WARNING

Do not operate the instrument in the presence of flammable gases or vapors, fumes, or finely-divided particulates.

WARNING

The instrument is designed to be used in office-type indoor environments. Do not operate the instrument

- In the presence of noxious, corrosive, or flammable fumes, gases, vapors, chemicals, or finely-divided particulates.
- In relative humidity conditions outside the instrument's specifications.
- In environments where there is a danger of any liquid being spilled on the instrument or where any liquid can condense on the instrument.
- In air temperatures exceeding the specified operating temperatures.
- In atmospheric pressures outside the specified altitude limits or where the surrounding gas is not air.
- In environments with restricted cooling air flow, even if the air temperatures are within specifications.
- In direct sunlight.

This instrument is intended to be used in an indoor pollution degree 2 environment. The operating temperature range is 0°C to 40°C and 20% to 80% relative humidity, with no condensation allowed. Measurements made by this instrument may be outside specifications if the instrument is used in non-office-type environments. Such environments may include rapid temperature or humidity changes, sunlight, vibration and/or mechanical shocks, acoustic noise, electrical noise, strong electric fields, or strong magnetic fields.

Do not operate instrument if damaged

WARNING

If the instrument is damaged, appears to be damaged, or if any liquid, chemical, or other material gets on or inside the instrument, remove the instrument's power cord, remove the instrument from service, label it as not to be operated, and return the instrument to B&K Precision for repair. Notify B&K Precision of the nature of any contamination of the instrument.

Clean the instrument only as instructed

WARNING

Do not clean the instrument, its switches, or its terminals with contact cleaners, abrasives, lubricants, solvents, acids/bases, or other such chemicals. Clean the instrument only with a clean dry lint-free cloth or as instructed in this manual. Not for critical applications

WARNING

This instrument is not authorized for use in contact with the human body or for use as a component in a life-support device or system.

Do not touch live circuits

WARNING

Instrument covers must not be removed by operating personnel. Component replacement and internal adjustments must be made by qualified service-trained maintenance personnel who are aware of the hazards involved when the instrument's covers and shields are removed. Under certain conditions, even with the power cord removed, dangerous voltages may exist when the covers are removed. To avoid injuries, always disconnect the power cord from the instrument, disconnect all other connections (for example, test leads, computer interface cables, etc.), discharge all circuits, and verify there are no hazardous voltages present on any conductors by measurements with a properly-operating voltage-sensing device before touching any internal parts. Verify the voltage-sensing device is working properly before and after making the measurements by testing with known-operating voltage sources and test for both DC and AC voltages. Do not attempt any service or adjustment unless another person capable of rendering first aid and resuscitation is present.

Do not insert any object into an instrument's ventilation openings or other openings.

WARNING

Hazardous voltages may be present in unexpected locations in circuitry being tested when a fault condition in the circuit exists.

WARNING

Fuse replacement must be done by qualified service-trained maintenance personnel who are aware of the instrument's fuse requirements and safe replacement procedures. Disconnect the instrument from the power line before replacing fuses. Replace fuses only with new fuses of the fuse types, voltage ratings, and current ratings specified in this manual or on the back of the instrument. Failure to do so may damage the instrument, lead to a safety hazard, or cause a fire. Failure to use the specified fuses will void the warranty.

Servicing












WARNING

Do not substitute parts that are not approved by B&K Precision or modify this instrument. Return the instrument to B&K Precision for service and repair to ensure that safety and performance features are maintained.

For continued safe use of the instrument

- Do not place heavy objects on the instrument.
- Do not obstruct cooling air flow to the instrument.
- Do not place a hot soldering iron on the instrument.
- Do not pull the instrument with the power cord, connected probe, or connected test lead.
- Do not move the instrument when a probe is connected to a circuit being tested.

Safety Symbols

Symbol	Name	Description
	DANGER	indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	WARNING	indicates a hazardous situation which, if not avoided, could result in death or serious injury
	CAUTION	indicates a hazardous situation which, if not avoided, will result in minor or moderate injury
	Caution	Refer to the text near the symbol.
		Electric Shock hazard
		Alternating current (AC)
		Chassis ground
		Earth ground
	On (Power)	This is the In position of the power switch when instrument is ON.
	Off (Power)	This is the Out position of the power switch when instrument is OFF.
	NOTICE	is used to address practices not related to physical injury.

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Product Overview

The series spectrum analyzer has a frequency range from 9 kHz up to 2.1 GHz (Model 2682) /3.2 GHz (Model 2683), numerous measurement functions are included.

- All-Digital IF Technology
- Frequency Range from 9 kHz up to 3.2 GHz
- 10 Hz Minimum Resolution Bandwidth(RBW)
- Preampifier
- Up to 3.2 GHz Tracking Generator
- Reflection Measurement Kit (Opt.)
- Advanced Measurements
- 10.1 inch display

1.1 Package Contents

- 1 x Model 2680 Spectrum Analyzer
- Power cord

1.2 Dimensions

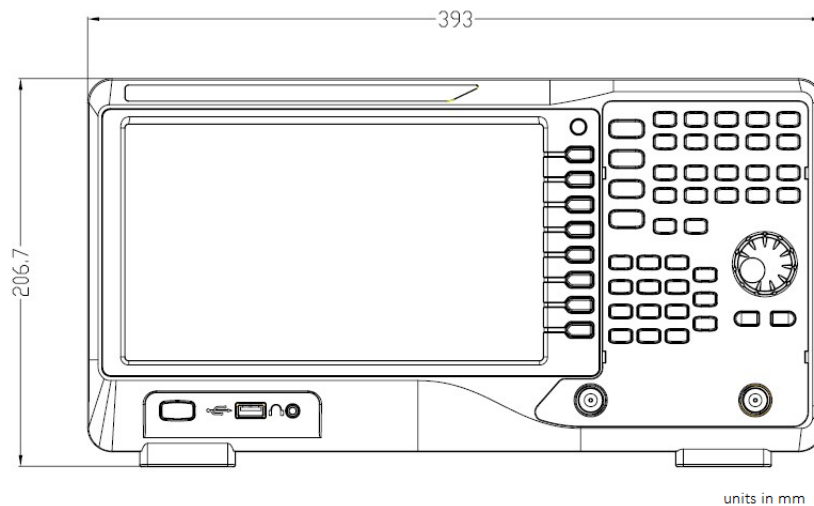


Figure 1.1 Front View

1.3 Input Power Requirements

The instrument has a selectable AC input that accepts line voltage and frequency input within:

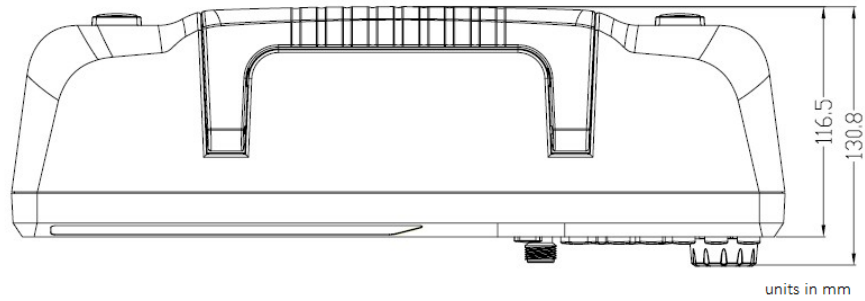


Figure 1.2 Top View

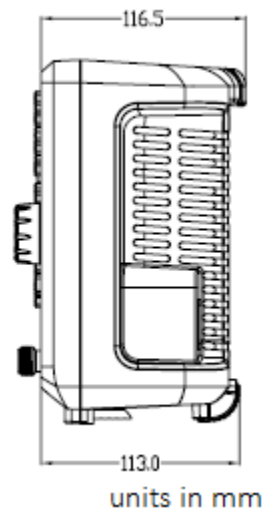


Figure 1.3 Side View

1.4 Fuse

An AC input fuse is necessary when powering the instrument. The fuse is located at the back of the instrument. If the fuse needs to be replaced, ensure the AC input power cord is disconnected from the instrument prior to replacement. Refer to **Table 1.2** for fuse requirements.



Before replacing fuse, disconnect the AC power cord first to prevent electric shock. Only use same rating of the fuse. Using a different fuse may damage the instrument.

1.4.1 Fuse Replacement

- Check and/or Change Fuse
 - Locate the fuse box above the AC input in the rear panel.
 - Remove the small insert. This piece holds the fuse.
 - Check and replace fuse for the desired line voltage.

Frequency	Voltage
47 to 60 Hz	100 to 220 V ($\pm 10\%$)
400 Hz	110 V ($\pm 10\%$)

Table 1.1 Input Power Requirements

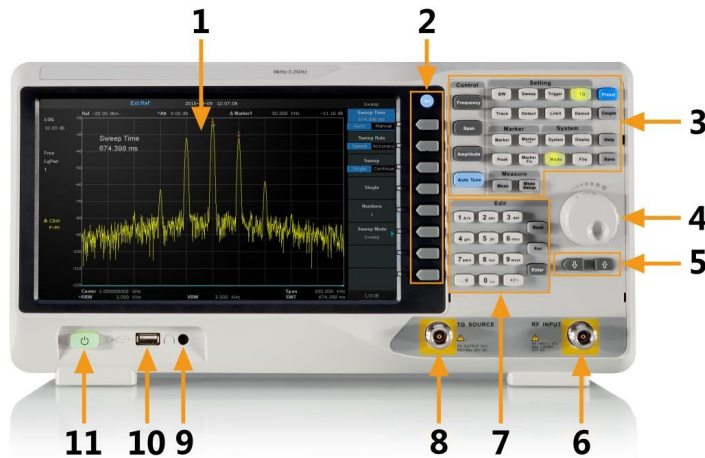
Line Voltage	Fuse
110 V	T 2 AL, 250 V
220 V	T 1 AL, 250 V

Table 1.2 Fuses

1.5 Power-up

1. **Verify AC Input Voltage** Verify and check to make sure proper AC voltages are available to power the instrument. The AC voltage range must meet the acceptable specification as explained in [Section 1.3](#).
2. **Connect Power and turn on analyzer** Connect AC power cord to the AC receptacle in the rear panel. The power button on the front panel should fade in and out. Press the power button to turn ON the instrument. The button should illuminate continuously and show the startup splash screen.

1.6 Front Panel



Front Panel Items			
1	User Graphical Interface	2	Menu Control Keys
3	Function Keys	4	Knob
5	Arrow Keys	6	RF Input
7	Numeric Keyboard	8	TG Output
9	Earphone interface	10	USB Host
11	Power Switch		

Figure 1.4 Front View

1.7 Rear Panel



Item	Description
1	Handle
2	USB Interface supporting: USB Interface supporting: USBTMC, USBCDC (virtual COM)
3	LAN Interface
4	REF IN 10 MHz
5	REF OUT 10 MHz
6	Trigger in
7	Kensington Lock
8	AC Power Input

Figure 1.5 Rear Panel

1. Handle
2. USB Interface (supports USBTMC, and USBCDC (virtual COM))
3. Ethernet
4. Reference in 10 MHz
5. Reference out 10 MHz
6. Trigger input
7. Security lock
8. AC power connector

1.8 Built-in Help

The built-in help system provides information about every function key at the front panel and every menu soft key. How to acquire built-in help

Press the "Help" key and a prompt about how to obtain help information will appear. Then press another key and relevant help information will be shown if available.

Close the current help information

When the help information show at the center of the screen. Press the the help information again to close it.

Front Panel



Figure 2.1 Function Keys

Function keys	Description
Frequency	Frequency menu (start, stop, center)
Span	Frequency Span menu
Amplitude	Signal amplitude menu (ref level, attenuator, pre-amp, scale, corrections)
Auto Tune	Automatically setup the instrument
BW	Bandwidth menu (resolution, video BW, averaging, filter)
Trace	Trace setup menu and math menu
Sweep	Sweep menu (time, number of sweeps, mode)
Detect	Detector menu (peak, sample, average)
Trigger	Trigger menu (Video Trigger/ External Trigger)
Limit	Pass, Fail Limit setup menu
TG	Tracking Generator menu
Demod	Demodulation menu (AM, FM)
Marker	Marker setup menu
Marker->	Apply marker to other analyzer functions (e.g. set center frequency to marker point)
Peak	Set the marker to the highest peak
Marker Fn	Marker function menu (enable, type, counter)
Meas	Measurement menu (power, BW, spectrum monitor, etc...)
Meas Setup	Configuration menu for an active measurements
System	System setup menu
Mode	Mode selection - spectrum or reflection
Display	Display setup (grid brightness, text, line presence)
File	File browser
Preset	Return to the default instrument state
Couple	Control RBW, VBW, Attenuator, Freq Step, and Sweep time
Help	Help menu
Save	Screenshot save key

Table 2.1 Function Keys

Display

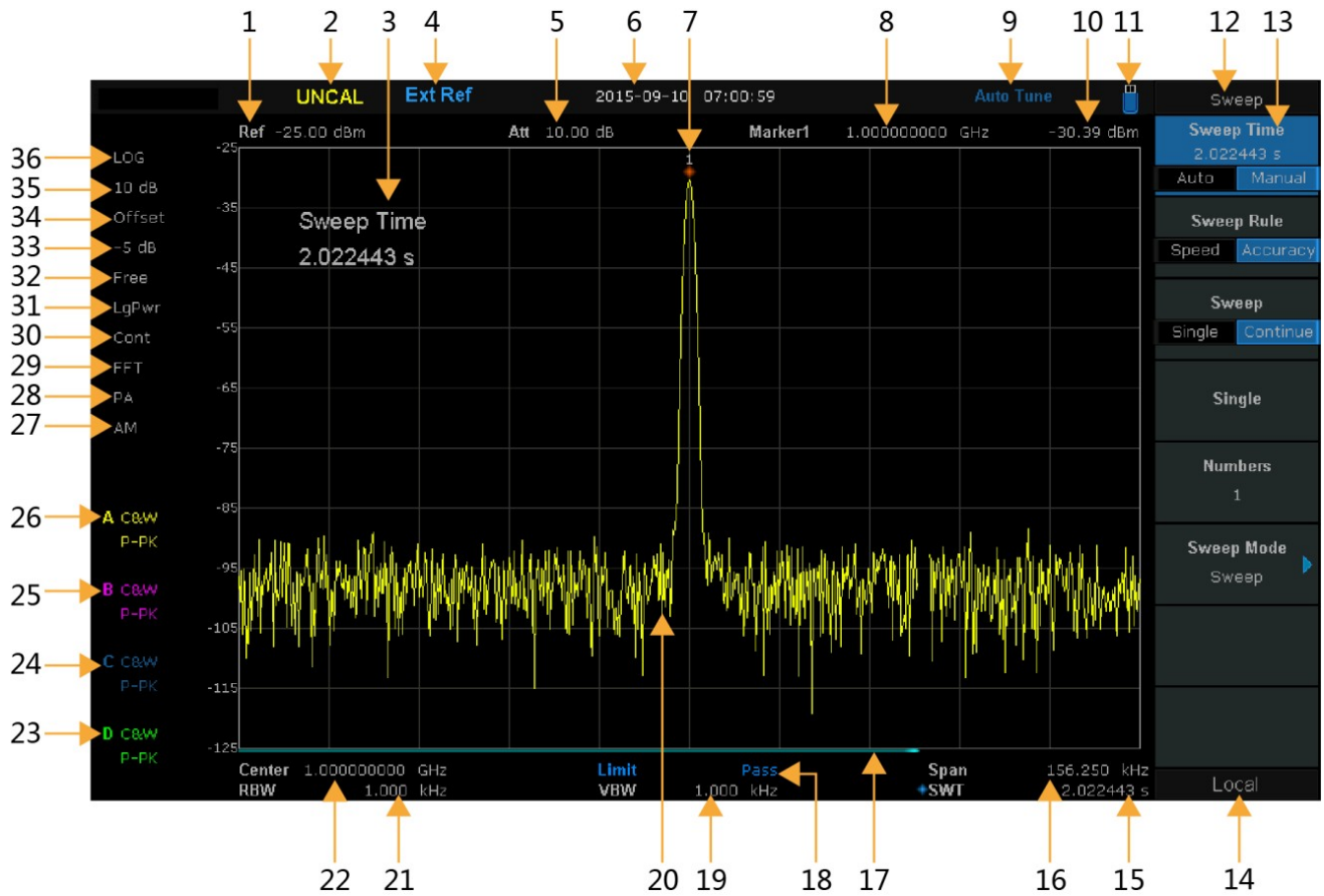


Figure 3.1 LCD Display

General Spectrum Analysis

Central to the use of the spectrum analyzer is the ability to see a large swath of frequencies and zoom into areas of interest within the range of the analyzer. By using the frequency, span, and amplitude menus provides the fundamental means of moving around the spectrum, and tuning to desired frequencies. In each menu, consistent with other menus, the values of each setting are adjusted by selecting them via the soft keys, and using the knob and keypad to make changes.

Frequency Menu Change the center, start, and stop frequencies.

Span Define the frequency range of interest.

Amplitude Adjust the gain/attenuation of the system front end. The Pre-amplifier is configured in this menu.

Many settings have a multiplier that needs to be applied to set the correct value. For example, setting the center frequency to 100 MHz can be done with the keypad by selecting "Center Freq" from the "Frequency" menu, entering 100 via the keypad and selecting the MHz soft-key on screen.

4.1 Frequency

Set the frequency parameters and functions of the analyzer. Each setting change restarts the frequency sweep. The displayed frequency range depends on the Start Frequency, Center Frequency and Stop Frequency. Changing any of them causes the others to change accordingly.

The value of each setting is modified 3 different ways:

Rotary knob Rotate to change the setting

Numeric Keys Enter the frequency value directly and select the multiplier (Hz, MHz, GHz)

Up/Down Keys Keys below the knob increase or decrease the frequency setting in increments of the "Freq Step" setting.

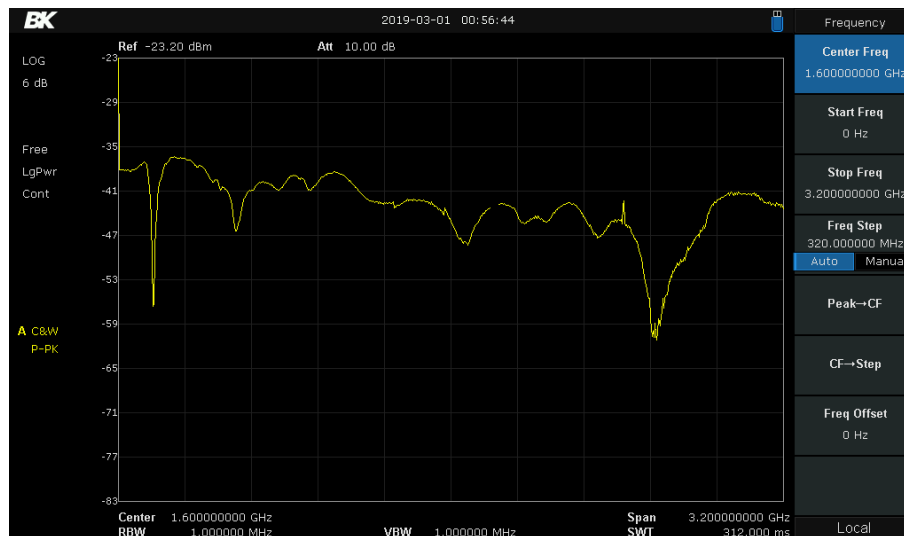


Figure 4.1 Frequency Menu

4.1.1 Center Frequency

In the **Frequency** menu, select the button beside the **Center Frequency** menu item to configure the center frequency. If the span setting does not hit the limits of the analyzer, the start and stop frequencies move along with the center frequency. That is, the span is not changed by changing the center frequency generally.

- In manual span mode. The span can be set down to 100Hz and up to the full span
- Modifying the span in non-zero span mode may cause an automatic change in both CF step and RBW if they are in Auto mode. Besides, the change of RBW may influence VBW (in Auto VBW mode).
- Variation in the span, RBW or VBW would cause a change in the sweep time.

The remaining settings:

Full Span Set the span of the analyzer to the maximum.

Zero Span Analyze one frequency. Set the span of the analyzer to 0Hz. In this mode, the horizontal axis represents time. See Section ?? for more information.

Zoom In Set the span to half of its current value.

Zoom Out Set the span to twice the current value.

Last Span Set the span to the previous span setting.

X-Scale Set the horizontal axis to be linear or logarithmic.

4.3 Amplitude

Set the signal amplitude setting of the analyzer with this menu. See **Figure 4.3**.

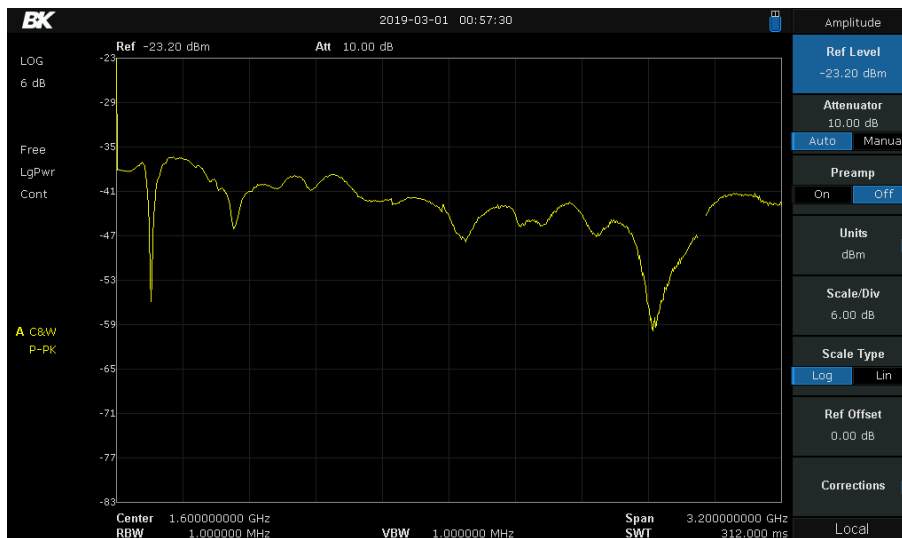


Figure 4.3 Amplitude Setting Menu

4.3.1 Ref Level

This setting is the upper signal limit of the display. The value is displayed at the upper left corner of the screen. The maximum reference level available is affected by the maximum mixing level, input attenuation is adjusted under a constant maximum mixing level in order to fulfill the following condition: $L_{Ref} \leq a_{RF} - a_{PA} - 30 \text{ dBm}$.

4.3.2 Attenuator

This setting defines the input attenuator level. This can be set manually or automatically determined by the analyzer.

4.3.3 RF Preamp

For small signals, the analyzer also includes an amplifier. For example, to clearly see radio stations far from the transmitters, it is necessary to enable the pre-amplifier. Used in concert with the reference level and attenuator, clearer signals can be found and measured.

4.3.4 Units

Set the Y-axis scale units to dBm, dBmV, dBuV, dBuA, Volts and Watts. The default setting is dBm.

4.3.5 Scale

Set the logarithmic units per vertical grid division on the display. This function is only available when the scale type is set to ``log``.

4.3.6 Scale Type

Set the scale type of Y-axis to linear or logarithmic. The default setting is the logarithmic scale. In Lin mode, Scale value cannot be changed.

4.3.7 Ref Offset

Assign an offset to the reference level to compensate for gains or losses generated between the device under measurement and the analyzer. Changing this value changes both the reference level readout and the amplitude readout of the marker, but does not impact the position of the curve on the screen.

4.3.8 Corrections

Amplitude corrections are available in this sub-menu in order to compensate for the gain or loss from external devices such as Antennae and Cables. When amplitude correction is enabled, both the trace and related measurement results are corrected. Corrections for RF Input impedance and at specific points are configured here. Correction settings and points are also loaded and saved from this menu by pressing the "Save/Load" menu and working with the file browser. 4 correction tables may be loaded as well as a correction for signal impedance (50/75 Ohms). See Figures 4.4, 4.5, and 4.6 for the menus shown.

If multiple correction factors are enabled, all related data will be used for amplitude correction.

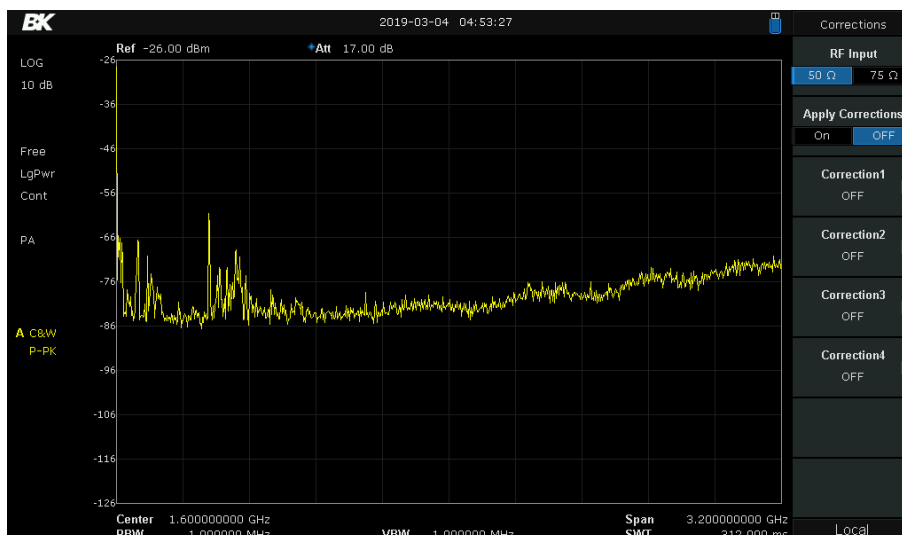


Figure 4.4 Corrections Setting Menu

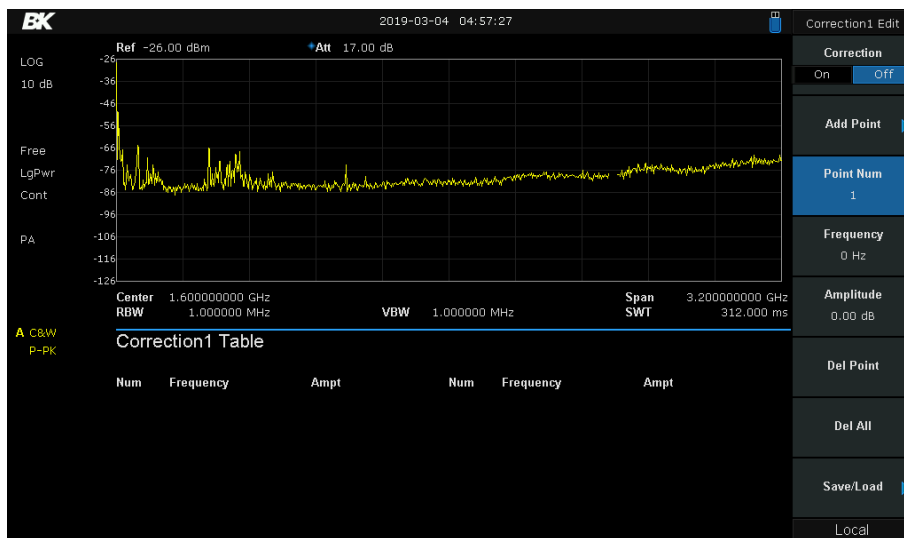


Figure 4.5 Correction Point Menu

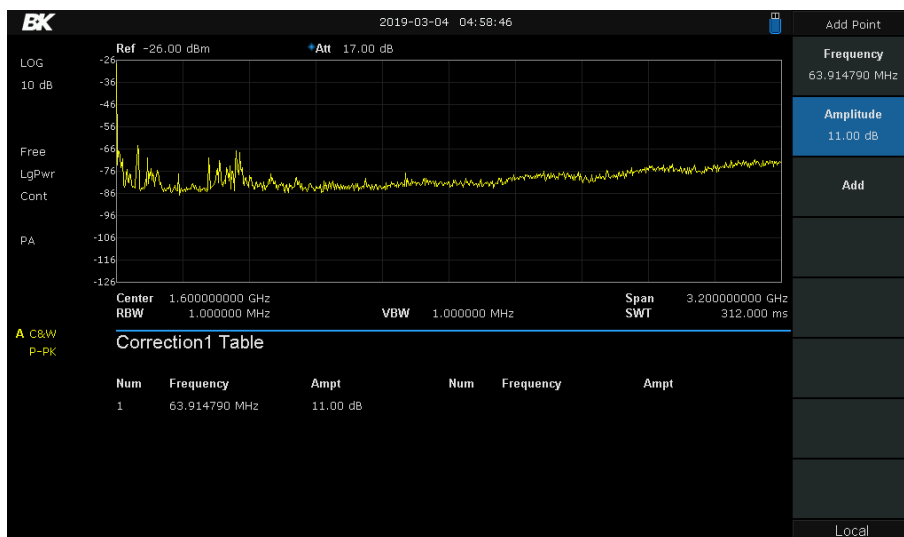


Figure 4.6 Correction Add Point Menu

4.4 Auto Tune

Search for signals automatically throughout the full frequency range, and adjust the frequency and amplitude for optimum display of one-key signal found in the search. While actively searching, "Auto Tune" is shown in the status bar on screen until the searching is finished.

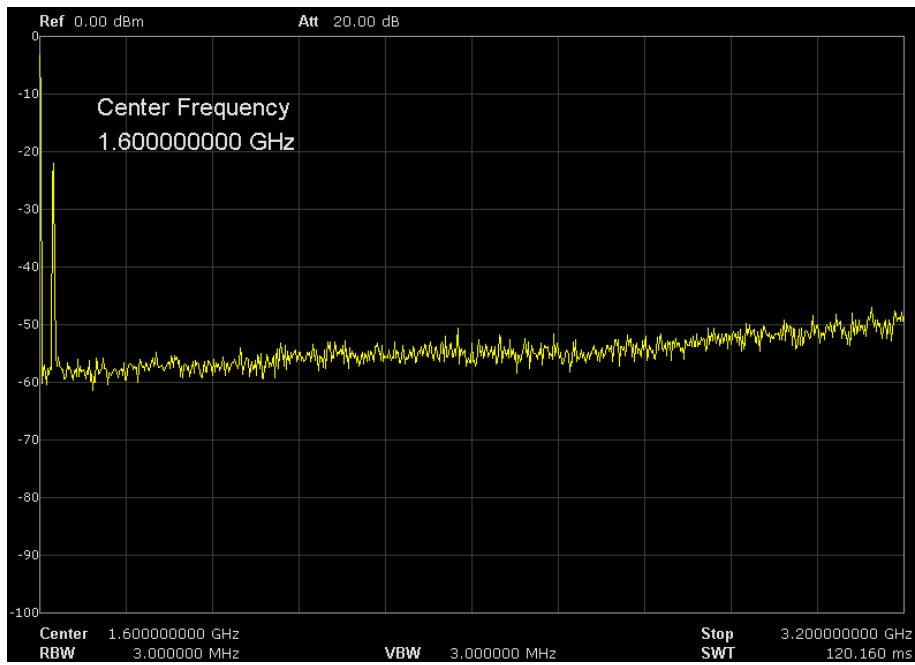


Figure 4.7 Before Auto Tune

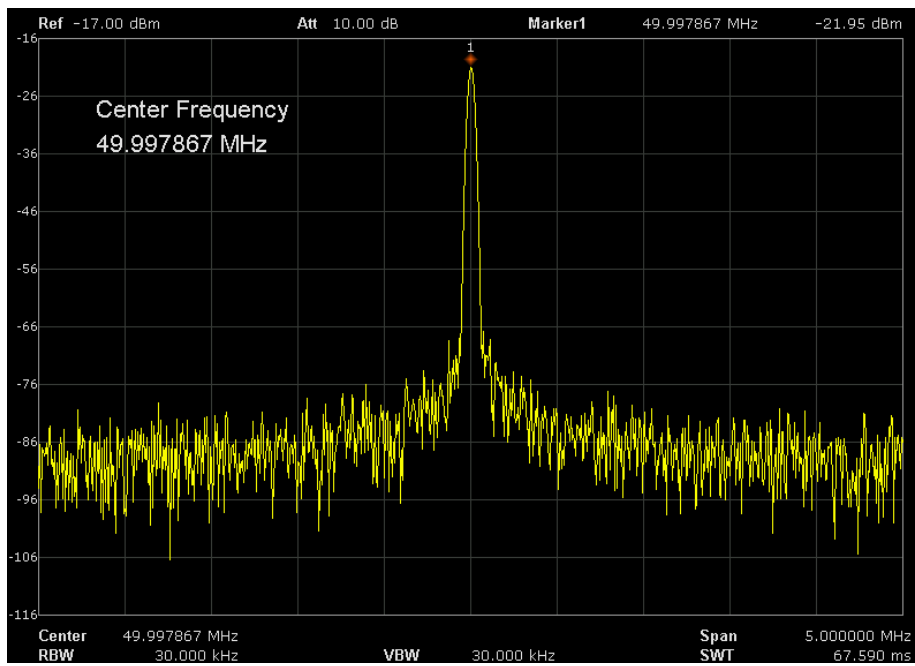


Figure 4.8 After Auto Tune

Settings

5.1 Bandwidth Menu

Settings for the “Resolution Bandwidth”, “Video Bandwidth”, and their ratio is set from this menu. Settings for the type of average and filter to use are also contained here. Access this menu by pressing the **BW** button on the instrument within the **Setting** area. See **Figure 5.1**.

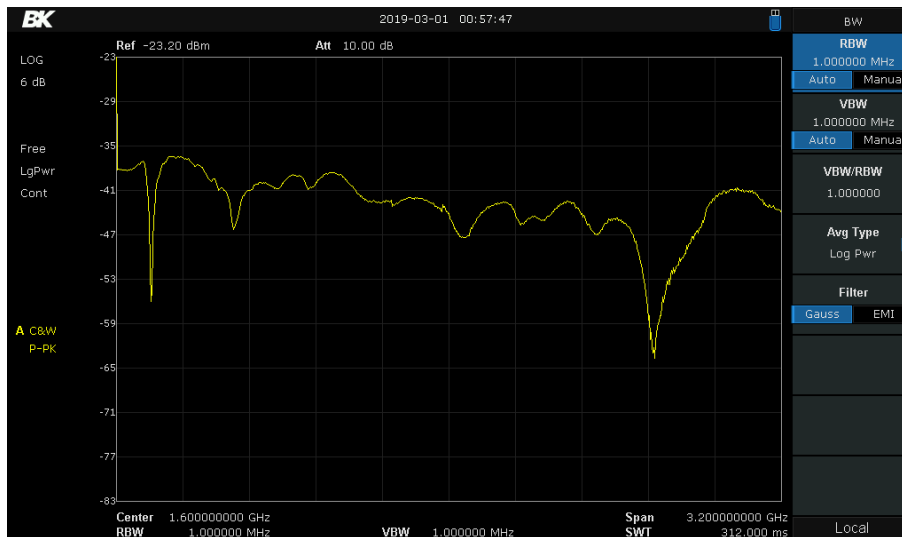


Figure 5.1 Bandwidth Menu

5.1.1 Resolution Bandwidth

Set the desired resolution bandwidth in order to distinguish between signals which are close in frequency. Reducing RBW will increase the frequency resolution, but will increase the sweep time.

5.1.2 Video Bandwidth

Set the desired video bandwidth in order to filter out the noise outside the video band. Reducing the VBW will smooth the spectrum line to highlight small signals from noise, but will increase the sweep time.

5.1.3 Video to Resolution Bandwidth Ratio

Set the ratio of Video and resolution bandwidth. Improved measurements can be had depending on the signal being measured:

- Sine signal** Use 1 to 3 (for faster sweeps)
- Pulse signal** Use 10 (to reduce the influence on the amplitude of transient signals)
- Noise signal** Generally use 0.1 (to obtain the noise average)

5.1.4 Average Type

3 types of averaging are available: log power (video), power (RMS), or voltage. When trace averaging is enabled, the average type is shown on the left side of the display.

Log Power Logarithmic (decibel) scale for all filtering and averaging processes. This scale is helps find CW signals near noise.

Power Average In this average type, all filtering and averaging processes work on the power (the square of the magnitude) of the signal, instead of its log or envelope voltage. This scale is best for measuring the true time power of complex signals.

Voltage Average In this Average type, all filtering and averaging processes apply to the voltage of the envelope of the signal. This scale is good for observing rise and fall behavior of AM or pulse-modulated signals such as radar and cellular transmitters.

5.2 Trace

Up to 4 different traces can be shown on screen at a time. Markers may be configured to make measurements relative to the traces as well. **Figure 5.2** the “Trace” menu is shown as well as 3 on screen traces. The trace in lavender is an averaged max-hold, yellow is the average signal, and blue is the averaged minimum-hold trace. Labels for each trace are shown in the trace’s color on the lower left side of the display.

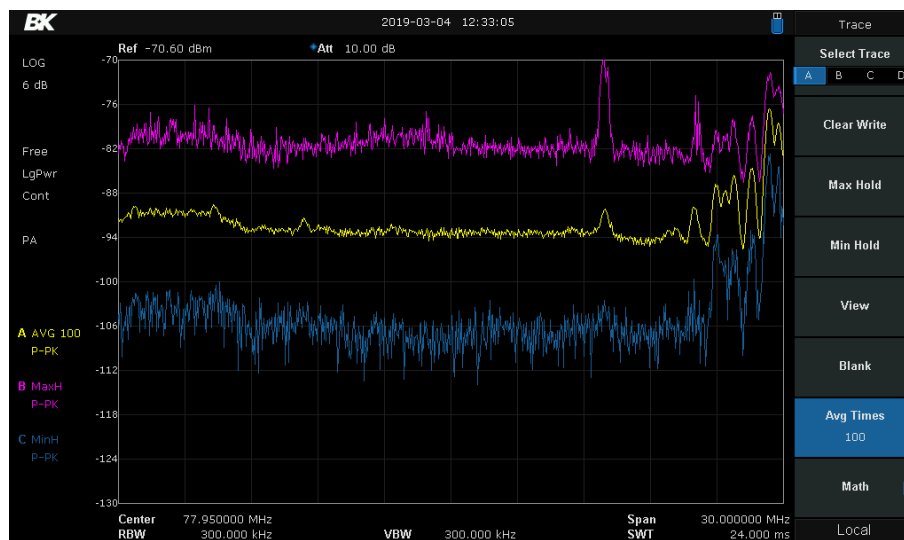


Figure 5.2 Trace Menu

Spectrum Analyzer allows for up to four traces to be displayed at the same time. Each trace has its own color. All traces can be independently configured. By default, spectrum analyzer will choose Trace A and set the type to Clear Write.

Clear Write Erases any data previously stored in the selected trace, and display the data sampled in real-time of each point on the trace.

Max Hold Retains the maximum level for each trace point of the selected trace. Updates the data if a new maximum level is detected in successive sweeps.

Min Hold Display the minimum from multiple sweeps for each point of the trace and update the data if a new minimum is generated in successive sweeps.

View Holds and displays the amplitude data of the selected trace. The trace data is not updated as the analyzer sweeps.

Blank Disable the trace display and all related measurements.

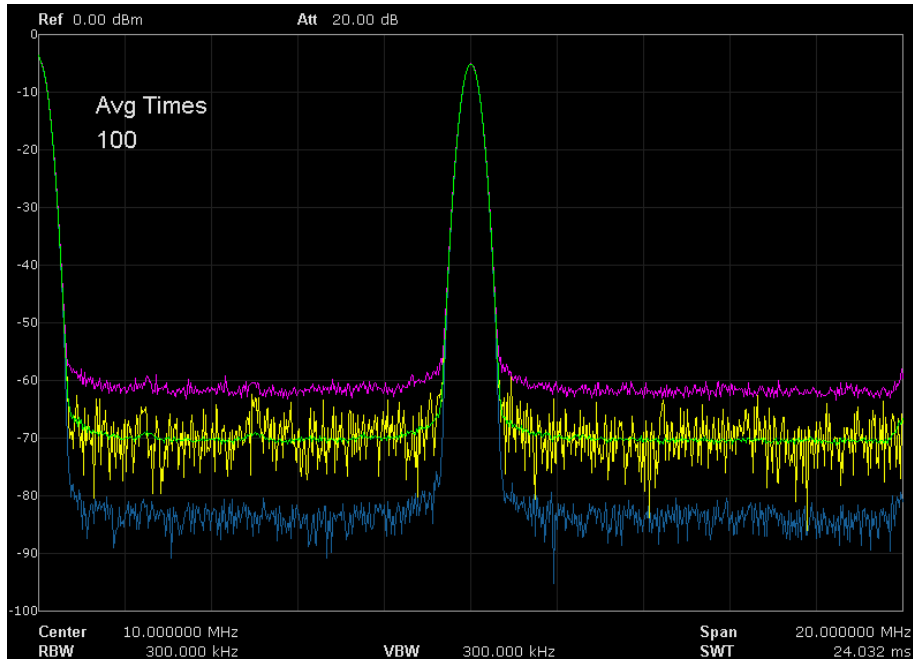


Figure 5.3 Trace Type

5.2.1 Trace Averaging

Trace signal averaging is set by the **Avg Times** setting in the **Trace** menu. Set the number of averages of the selected trace. A larger number of averages can reduce the noise and the influence of other random signals; thus highlighting the stable signal characteristics.

5.2.2 Math

Additionally, a set of math functions can be applied to the measured signals. This can be useful for finding small signals near the noise floor. For example, using the difference between Max and Min hold traces and adding an offset to move the trace into the screen. To do so, open the **Trace** menu and select the **Math** function. The math configuration menu will be shown as in **Figure 5.4**.

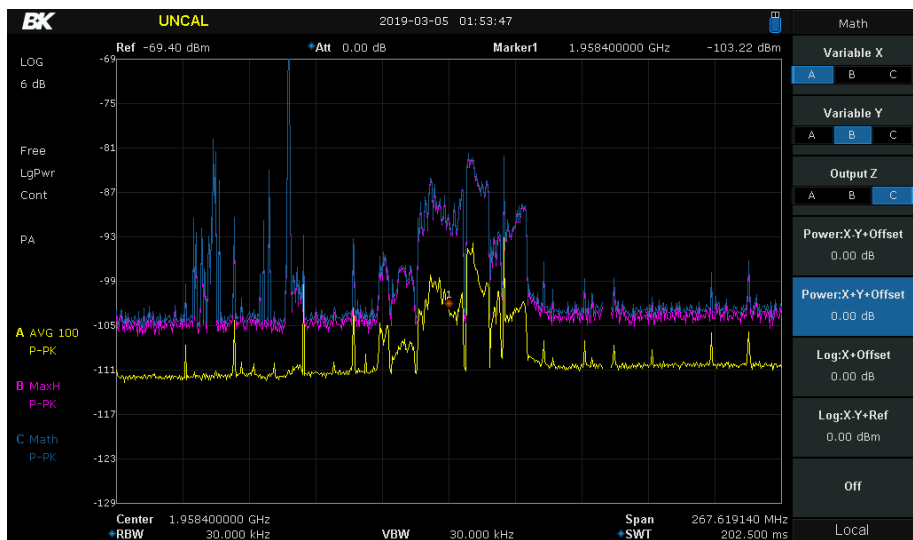


Figure 5.4 Trace Math Menu

Variable X, Y Select A, B, or C as the math source data

Output Z The trace to use as the math output

Power: X-Y+Offset The difference in between the 2 selected signals. This compares the absolute power difference. For example, 2 signals of -20 and -26 dBm (A and B respectively) yield approximately -21.2 dBm.

Power: X+Y+Offset The sum of 2 signals. This combines the absolute power levels.

Log: X+Offset Take a signal and offset it a value in dB. The “ref” is the offset of the signal from 0 dB.

Log: X-Y+Ref Take the relative difference between 2 signals.
Ex. A is -20 dB and B is -26 dB, the value of this will be 6dB.
Use the “ref” value to move the signal.

5.3 Detect

The analyzer displays the sweep signal on the screen in the form of trace. For each trace point, the analyzer always captures all the data within a specific time interval and processes (Peak, Average, etc.). The captured data uses the detector currently selected and then displays the processed data on the screen. Selecting an appropriate detector type according to the actual application ensures the best measurement accuracy. The available detector types are:

Positive Peak Displays the maximum value of data sampled within the corresponding time interval.

Negative Peak Displays the minimum value of data sampled within the corresponding time interval.

Sample Displays the transient level corresponding to the central time point of the corresponding time interval. This detector type is applicable to noise or noise-like signals.

Normal (also called a Rosenfell or Min/Max detector) Displays the maximum value and the minimum value of the sample data segment in turn. For an odd-numbered data point, the maximum value is displayed, and for an even-numbered point, the minimum value. This helps to show the amplitude variation range of the signal.

Average Displays the average value of data sampled within the corresponding time interval.

5.4 Sweep

As signals are discriminated across the spectrum, the analyzers performs a frequency sweep. As signals are measured, they are displayed on screen. For a fast sweep time, this happens quickly. For a long sweep, a progress indicator is shown at the bottom of the screen. The corresponding waveform is updated accordingly. See **Figure 5.5**.

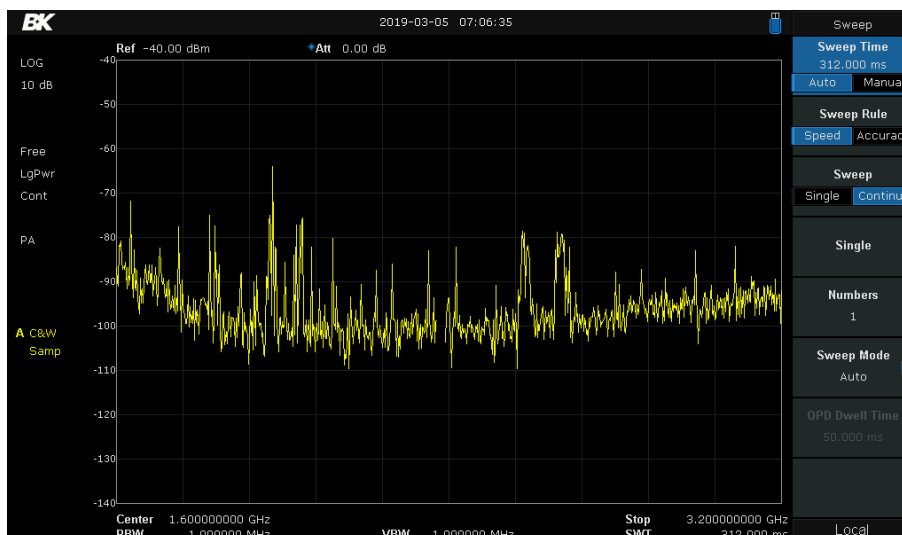


Figure 5.5 Sweep Menu

5.4.1 Sweep Time

Set the time needed for the spectrum analyzer to finish a sweep. The sweep time can be set automatically or manually. In zero span mode, the sweep time corresponds to the time shown on screen. Also note that while decreasing the sweep time speeds up measurement, it also can cause error if the specified sweep time is less than the minimum sweep time in Auto coupling. At this point, "UNCAL" is shown in the status bar of the screen.

5.4.2 Sweep Rule

The analyzer provides two sweep goals that help determine automatic sweep time:

Speed Activates the default fast sweep time rule.

Accuracy Activates the normal sweep time rule to ensure the measurement accuracy. Speed sweep time rule provides a fast measurement function that decreases the sweep time. Using Fast Sweep will decrease the measurement accuracy.

5.4.3 Single/Continuous sweeping

By default, the analyzer is set to continuously start a new sweep after the current one is complete. For some cases it may be helpful to stop the instrument after a single or set of sweeps. For continuous sweeping, set the **Sweep** setting to "Continuous". To run a prescribed number of sweeps, set the **Sweep** setting to single and set the number of sweeps to run in the **Numbers** field.

In "Single" mode, press the **Single** soft-key to start sweeping.

All sweeping is started when enabled and the conditions defined by the "Trigger" settings are met.

5.4.4

Sweep mode includes auto, sweep and FFT.

Auto Mode - When the sweep mode is auto-coupled, the analyzer selects the sweep mode automatically between Sweep and FFT Mode. Sweep Mode - Work in point-by-point scanning, slow and time-consuming, fits when RBW is more than 10k Hz. FFT Mode - Work in Parallel scans, fast and short time. This FFT mode is only available when RBW is set to 1 kHz, 3 kHz, or 10 kHz.

5.5 Trigger

The trigger type can be Free Run, Video or External.

5.5.1 Free Run

The trigger conditions are satisfied at any time and the analyzer generates trigger signals continuously.

5.5.2 Video

A trigger signal will be generated when the system detects a video signal of which the voltage exceeds the specified video trigger level.

Note: This function is invalid in Avg detection in zero span mode. Trigger level - Set the trigger level in video trigger. At this point, the trigger level line (TL) and value are displayed on the screen. You can use the numeric keys, knob or direction keys to modify this parameter. Please refer to "Parameter Setting" for more details.

5.5.3 External

In this mode, an external signal (TTL signal) is input from the TRIGGER IN connector at the rear panel and trigger signals are generated when this signal fulfills the specified trigger edge condition.

Set the trigger edge in external trigger to the rising (Pos) or falling (Neg) edge of the pulse. Note: When “Free Run” is selected, Trig Setup is grayed out and disabled.

5.6 Limit

Spectrum Analyzer supports the Pass/Fail test function. In this function, the measured curve is compared with the pre-edited curve. If the related rules are met, the result is “Pass”; or else is “Fail”.

5.6.1 Limit Switch

Select the desired limit line (upper or lower) for editing. Each limit line has its own switch. You can test according to both together, either one or neither.

5.6.2 Edit

Edit the properties of the limit lines. Table 2- 18 Pass/Fail Menu

	Explanation
Upper/Lower	Select the desired limit line (upper or lower) for editing
Mode	Select the line or point for editing. Set the number of the point to be edited if you selected the point type. The range is from 1 to 100
Add point	Add a new point for editing.
X-axis	Edit the X-axis value (frequency or time) of the current point. If the X-axis unit is frequency and the Ref Freq is enabled, edit the frequency difference between the frequency of the current point and the center frequency.
Amplitude	Edit the amplitude of the current point or line. If the Ref AMPT is enabled, edit the amplitude difference between the amplitude of the current point and the reference level.
Del Point	Delete the point you are editing.
Del All	Delete all point.
Save/Recall	Save or load the limit file.

Table 5.1 Pass/Fail Menu

5.6.3 Test

Enable or disable the limit test function.

5.6.4 Setup

Fail to stop Select whether the instrument will continue or stop operation when a failure occurs. Buzzer Turn on or off the buzzer. When the buzzer is on, it beeps when a failure occurs. X Axis Set the X-axis unit to frequency or time unit. Note that all the points of the current limit line will be deleted when the X-axis unit changes.

5.7 TG

Set the parameter related to the tracking generator (TG).

5.7.1 TG

TG is used to enable or disable the TG. When the TG is enabled, a signal with the same frequency of the current sweep signal will be output from the [GEN OUTPUT 50 Ω] connector at the front panel. The power of the signal could be set through the menu.

5.7.2 TG Level

Set the output power of the signal of the tracking generator. You can use the numeric keys, knob or direction keys to modify this parameter. For more details, please refer to "Parameter Setting".

5.7.3 TG Level Offset

Assign a certain offset to the output power of the TG when gains or losses occur between the TG output and external device in order to display the actual power value. Key Points:

- This parameter only changes the readout of the TG output power, rather than the actual value of it.
- The offset could be either a positive (gain in the external output) or a negative (loss in the external output).
- You can use the numeric keys, knob or direction keys to modify this parameter. For more details, please refer to "Parameter Setting".

5.7.4 Normalize

Normalization can eliminate the error of TG Level. Before using this function, connect the [GEN OUTPUT 50 Ω] output terminal of the TG with the [RF INPUT 50 Ω] input terminal of the analyzer.

- Normalize - Enable or disable the normalization. When enabled, the reference trace will be stored automatically after the current sweep finishes if no reference trace is stored before. During the reference trace storage, the corresponding prompt message is displayed. When normalization is enabled, the corresponding value of the reference trace will be subtracted from the trace data after every sweep.
- Norm Ref Lvl - Adjust the vertical position of the trace on the screen by adjusting the reference level when normalization is enabled. Being different from the Ref Level function in the AMPT menu, this parameter has no influence on the reference level of the analyzer. You can use the numeric keys, knob or direction keys to modify this parameter. For more details, please refer to "Parameter Setting".
- Norm Ref Pos - Adjust the vertical position of the normalization reference level on the screen by adjusting the reference position when normalization is enabled.
- The function of this menu is similar to that of Norm Ref Lvl. When it is set to 0%, the normalization reference level is displayed at the bottom of the screen grid and at the top when it is set to 100%.
- You can use the numeric keys, knob or direction keys to modify this parameter. For more details, please refer to "Parameter Setting".
- Ref Trace - Set whether to display the reference trace or not. If "View" is selected, the reference trace saved (Trace D) will be shown in "FreezeView" type.

- Note: When normalization is enabled, the unit of Y-axis is “dB” and will not be influenced by the definition in AMPT->Units. At this point, “(dB)” is displayed under the Y-axis scale in the user interface.

5.8 Demod

Press Demod at the front panel to enter the demodulation setting menu. Both AM and FM demodulations are available in this device.

5.8.1 Demod (AM/FM)

Set the demodulation type to AM or FM; or disable the demodulation function. The default is off. Key Points:

- The system will enable a marker automatically, place it at the center frequency and perform AM (or FM) demodulation on this frequency point after you enable AM (or FM) demodulation.
- Analyzer provides earphone jack and the demodulated signal can be output in audio frequency (AF) mode through the earphone. The frequency and intensity of AF denotes the frequency and amplitude of the signal respectively.

5.8.2 Earphone

Set the status of the earphone. When it is on, the demodulated signal can be heard through the earphone during the demodulation. By default, it is off.

5.8.3 Volume

Set the volume of the earphones.

5.8.4 Demod Time

Set the time for the analyzer to complete a signal demodulation after each sweep. If Earphone is set to “On”, you will hear the demodulated signal through the earphone during the demodulation. You can use the numeric keys, knob or direction keys to modify this parameter. For more details, please refer to “Parameter Setting”.

Measurement Setup

Provide measurement function, the screen will be divided into two parts, the above part is measure screen, displaying trace, the other part is used to display result of a measurement.

6.1 Channel Power

Measure the power and power density within the specified channel bandwidth. When this function is enabled, the span and resolution bandwidth are automatically adjusted to smaller values. Select **Channel Power** and press **Meas Setup** to set the corresponding parameters.

6.2 ACPR

Measure the powers of the main channel and adjacent channels as well as the power difference between the main channel and each of the adjacent channels. When this function is enabled, the span and resolution bandwidth of the analyzer are adjusted to smaller values automatically.

Select **ACPR** and press **Meas Setup** to set the corresponding parameters.

6.3 Occupied BW

Integrate the power within the whole span and calculate the bandwidth occupied by this power according to the specified power ratio. The OBW function also indicates the difference (namely "Transmit Freq Error") between the center frequency of the channel under measurement and the center frequency of the analyzer. Select **Occupied BW** and press **Meas Setup** to set the corresponding parameters.

6.4 T-Power

The system enters zero span mode and calculates the power within the time domain. The types of powers available include Peak, Average and RMS. Select **T-Power** and press **Meas Setup** to set the corresponding parameters.

6.5 Meas Off

Turn off all the Meas function.

1. meas-setup
2. Channel Power

Measurement Results: channel power and power spectral density.

- Channel Power: power within the integration bandwidth.
- Power Spectral Density: power (in dBm/Hz) normalized to 1 Hz within the integration bandwidth.

Measurement Parameters: Center Freq, integration bandwidth , Span, Span power

1 Center Freq

Sets the center frequency of display this CF which is the same with the CF of the analyzer. Modifying this parameter will change the CF of the analyzer.

Integration bandwidth

Set the frequency width of the channel to be tested and the power of the channel is the power integral within this bandwidth. You can use the numeric keys, knob or direction keys to modify this parameter.

Span

Set the frequency range of the channel. This span which is the same with the span of the analyzer is the frequency range of the sweep. Modifying this parameter will change the span of the analyzer.

- The channel power span is related to the integration bandwidth and the range available is from integration bandwidth to integration bandwidth \times 20.
- You can use the numeric keys, knob or direction keys to modify this parameter.

4Span Power

Set the integrated bandwidth to the sweep span of display. The channel power and power spectral density display on the screen simultaneously.

6.6 ACPR

Adjacent Channel Power Measurement: Main CH Power, Left channel power and Right channel power.

- Main CH Power: display the power within the bandwidth of the main power
- Left channel power : display the power of left channel and the power difference between the left channel and the main channel (in dBc)
- Right channel power: display the power of the right channel and the power difference between the right channel and the main channel in dBc

Measurement parameter: center frequency, main channel bandwidth, adjacent channel bandwidth and channel spacing

1 Center Frequency

Sets the center frequency of display this CF which is the same with the CF of the analyzer. Modifying this parameter will change the CF of the analyzer.

Main channel bandwidth

Set the bandwidth of the main channel and the power of the main channel is the power integral within this bandwidth. You can use the numeric keys, knob and direction keys to modify this parameter.

Adjacent channel bandwidth

Set the frequency width of the adjacent channels.

- The adjacent channel bandwidth is related to the main channel bandwidth and the range available is from main channel bandwidth/20 to main channel bandwidth \times 20.
- You can use the numeric keys, knob or direction keys to modify this parameter.

Adjacent Channel space

Set the difference between the center frequency of the main channel and the center frequency of the adjacent channels.

- Adjusting this parameter will also adjust the distance between the upper/lower channel and the main channel.
- You can use the numeric keys, knob or direction keys to modify this parameter.

6.6.1 OBW

OBW measurement: occupied bandwidth and transmit frequency error.

- Occupied Bandwidth: integrate the power within the whole span and then calculate the bandwidth occupied by the power according to the specified power ratio.

- Transmit Frequency Error: difference between the center frequency of the channel and the center frequency of the analyzer.

1. T-Power

T-Power: namely the power of the signal from the start line to the stop line. Measurement Parameter: center frequency, start line, stop line

Center Frequency

Sets the center frequency of display, this CF which is the same with the CF of the analyzer. Modifying this parameter will change the CF of the analyzer.

Start line

Set the left margin (in time unit) of T-Power measurement. The data calculated under this measurement is between the start line and stop line. You can use the numeric keys, knob or direction keys to modify this parameter.

Stop line

Set the right margin (in time unit) of T-Power measurement. The data calculated under this measurement is between the start line and stop line. You can use the numeric keys, knob or direction keys to modify this parameter.

Markers

Four main markers are available for making measurements of signal level, signal period, bandwidth, peaks, relative values, noise level, and others. Marker measurements apply to all traces captured on screen. For example, set **Trace B** to **Max-Hold** and make relative measurements to a trace set to **Clear Write (live data)**. To configure these settings use the 4 buttons within the blue square labeled “Marker”. Each marker is shown in orange, often with the marker number above it. See **Figure 7.1**. The type and availability of markers depends on what spectrum analyzer mode is used, and the menus change accordingly.

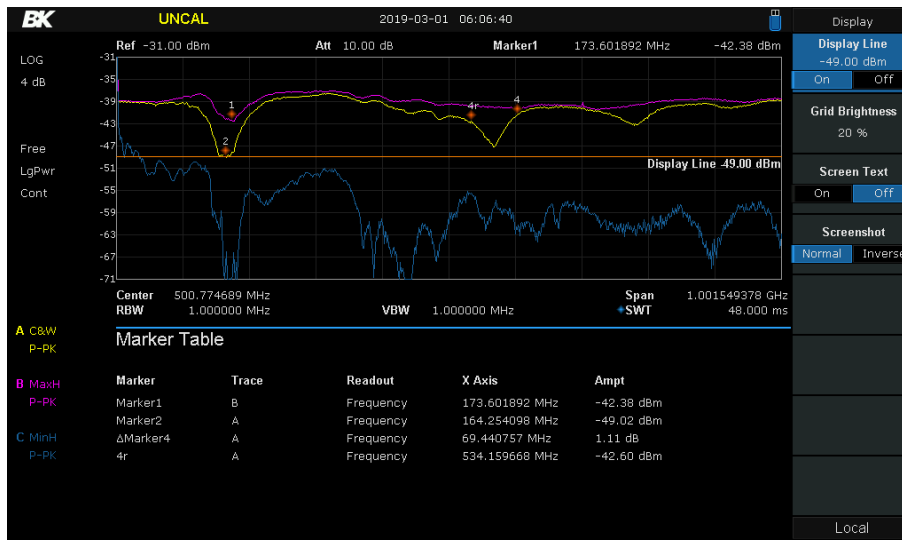


Figure 7.1 Markers

7.1 Spec Analyzer Mode

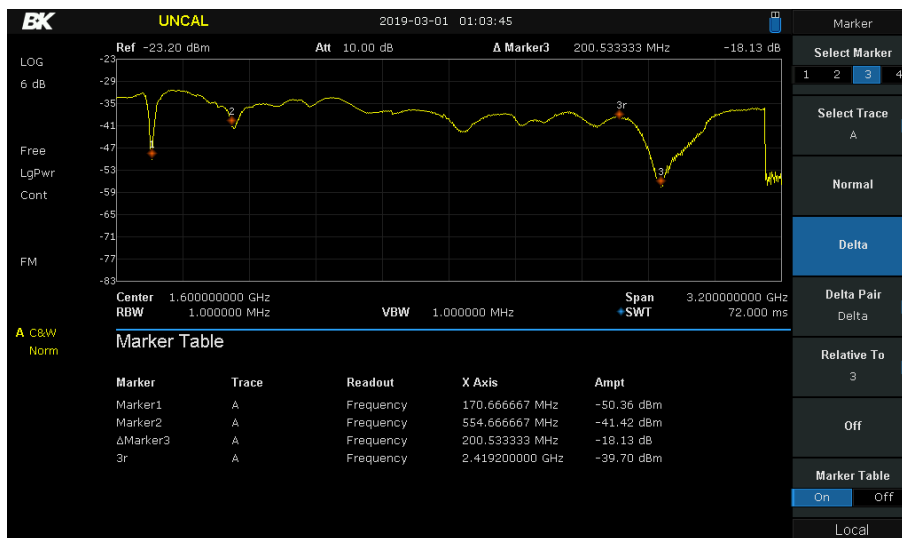


Figure 7.2 Marker Menu

When markers are active, the data is displayed at the top of the screen. Also, by activating the “Marker Table”, data for each marker is shown on screen. See **Figure 7.2**.

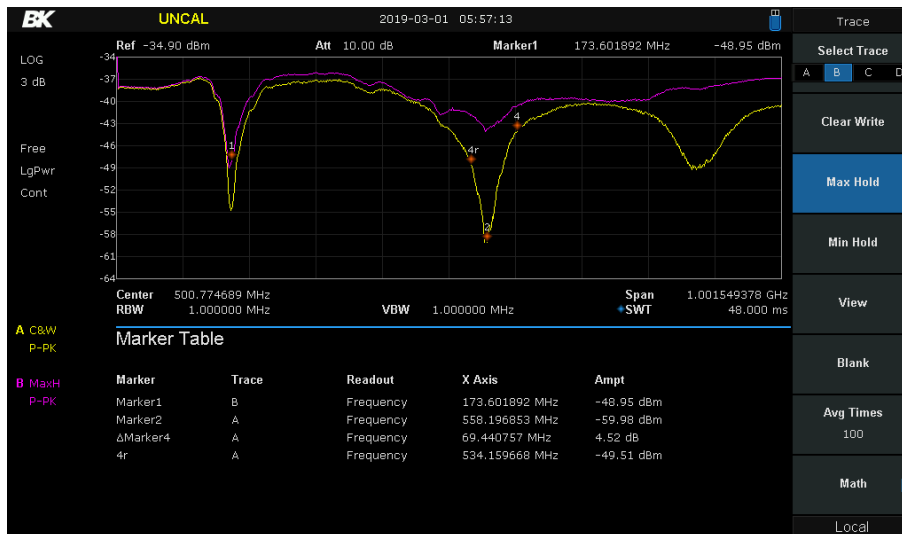


Figure 7.3 Marker Table

7.1.1 Normal Marker

Mark an X position representing frequency or time, and the corresponding signal amplitude at that point. In the Marker Table, the value shows the marker values.

7.1.2 Delta Markers

Mark and measure the difference between 2 points. In the Marker Table, 2 points are shown.

- The **[1-4]r** entry is the reference point and the data shown is the measurement value at that point.
- Δ Marker[1-4] is the offset point and the values are the change from **[1-4]r**.
- The reference marker is placed at the center frequency on screen at the time of activation. If another location is desired, activate a **normal** marker, set the desired point, then change the marker type to **delta**.
- When the Noise Marker function under the Marker Fn menu is activated, the result of the noise measurement is automatically corrected for and normalized to 1 Hz.

7.1.3 Delta Pair Markers

This setting creates a pair of markers and measures relative values between them, one is denoted the reference **[1-4]r** and the other is relative to the reference labeled **[1-4]**. Marker movement is defined in 4 different ways:

Delta The relative marker **[1-4]** moves

Ref The reference marker **[1-4]r** moves

Span Both markers move toward and away from each other equally

Center Both markers move together and maintain their relative spacing horizontally

7.1.4 Off

This marker mode disables the selected marker.

7.2 Reflection Measurement

Markers available for reflection measurements are much like **Normal** markers in spectrum analyzer mode. Marker measurements are shown in a table like Table ???. The return loss, reflection coefficient, and Voltage Standing Wave Ratio (VSWR) is shown for each marker. The frequency (shown in Hz or period (1/f)) of the marker or the time from the sweep start is also shown. This is the **X-Axis** value shown in the table.

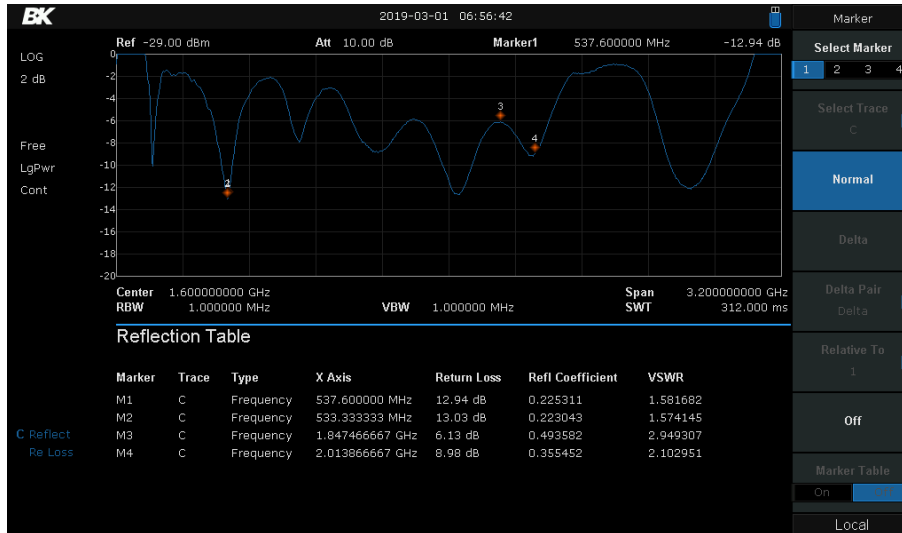


Figure 7.4 Reflection Measurement Marker Table

7.3 Marker Table

Display all the markers enabled on the lower portion of the screen, including marker number, trace number, marker readout type, X-axis readout and amplitude. Through this table you can view the measurement values of multiple points. The table allows for up to eight markers to be displayed at one time.

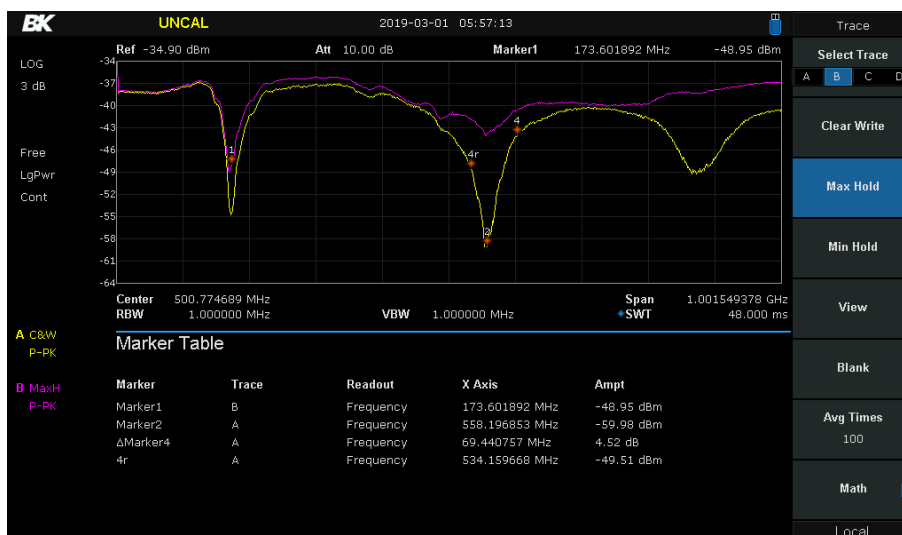


Figure 7.5 Marker Table

7.4 Marker To

Markers may be used to center, and change the sweep frequencies. Effective use of this function can help to quickly focus in on desired signals. Access this menu by pressing the **"Marker→"**.

- If a **Normal** marker is selected, the center frequency will be set to the frequency of the current marker.
- If a **Delta**, or **Delta Pair** marker is selected, the setting is set to the frequency of the Delta Marker.
- Most of the functions do not apply to “**Zero Span**” mode.

The functions available here are shown in Figure ?? and described below:

M→CF Set the center frequency of the analyzer to the frequency of the current marker

M→CF Step Set the center frequency step of the analyzer to the frequency of the current marker.

M→Start Freq Set the start frequency of the analyzer to the frequency of the current marker.

M→Stop Freq Set the stop frequency of the analyzer to the frequency of the current marker.

M→Ref Level Set the reference level of the analyzer to the amplitude of the current marker. This action also works in “**Zero Span**” mode.

ΔM→Span Set the span of the analyzer to the frequency difference between the two markers in Delta, or Delta Pair. This function is not available for “Normal” markers.

ΔM→CF Set the center frequency of the analyzer to the frequency difference between two Delta, or Delta Pair markers

7.5 Marker Functions

In addition to showing frequency and level, markers may be configured to display more information. This information can be the noise at a point, noise bandwidth, and a frequency counter representation of the point. To access the **Marker Function** menu, press the “Marker Fn” button. Settings for each of the 4 available markers is opened on screen. See **Figure 7.6**. Special marker functions include Noise Marker, N dB BW and Freq Counter.

Setting the marker function to off disables the functions listed in this section and does not disable the marker itself.

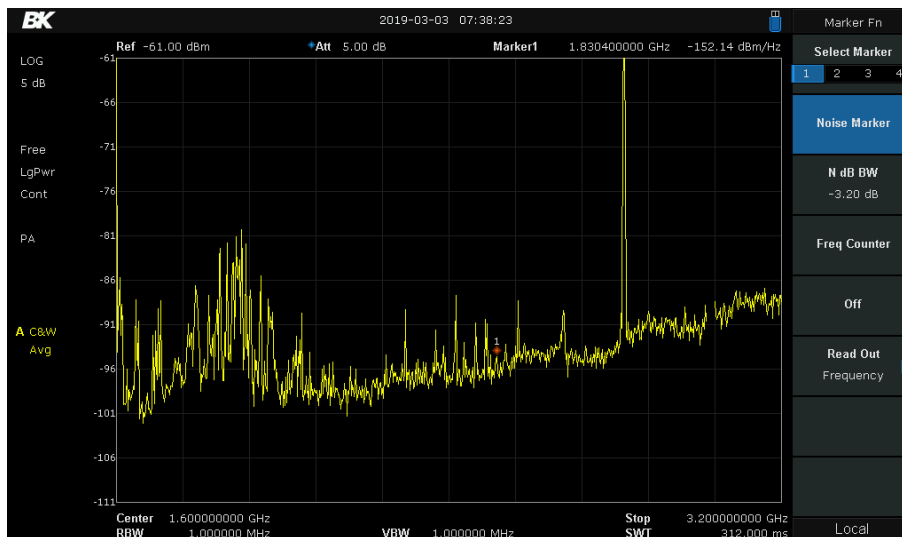


Figure 7.6 Marker Function Menu

7.5.1 Noise Marker

The Noise marker function displays the noise power spectral density measured in dBm/Hz. Activating the **Noise Marker** will first set its to Normal type automatically. The noise measurement is the average noise level at the marked point

normalized to 1 Hz bandwidth. The measured value is effected by the detection and trace types used. More precise measurement is made if RMS Avg or Sample detection is used. This function can be used for measuring the C/N ratio.

7.5.2 N dB BW

N dB BW represents the frequency difference between two points that are located on either side of the current marker that fall within the dB fall (N<0) or rise (N>0) in amplitude as shown in **Figure 7.7**. When the measurement starts, the analyzer will search for the two points which are located at both sides of the current point with N dB fall or rise in amplitude and display the frequency difference between the two points in the active function area. "—" would be displayed if the search fails.

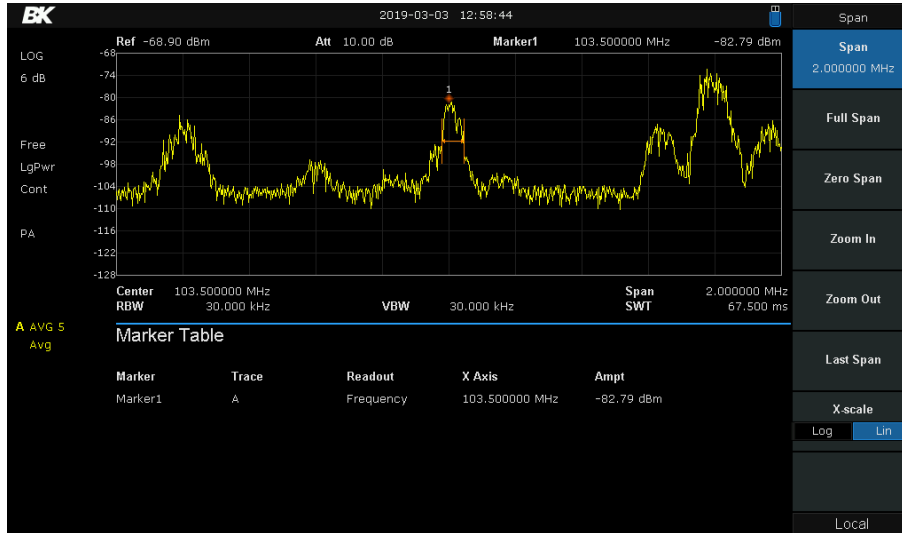


Figure 7.7 N dB BW

7.5.3 Frequency Counter

The marker function can lastly be set to read the frequency at the marker's location. Use this when the marker is set to jump to a peak and read the peak frequency. The frequency counter function is only applicable to marker 1.

7.5.4 Read Out

The marker x-axis position is represented in 3 ways: frequency, period, and ΔT . This setting changes the readout but does not change the actual measured value. The frequency and period represent the conventional idea, but ΔT shows the time difference between the marker and the start of the sweep. The Delta marker and Delta Pair marker show the sweep time difference between the delta marker and reference marker.

7.6 peak

The remaining button in the **Marker** section is the peak detector. Peak detection points may be used to set the center frequency, and easily list the 16 highest peaks shown on screen. By setting the "Search" settings, positive or negative peaks with a prescribed level may be found automatically. Negative peaks may be especially useful when using the tracking generator. **Figure 7.8** shows the "Peak" menu screen and a scan of radio stations in Los Angeles.

Peak→CF Set the first

Next Peak Search for and mark the peak whose amplitude is closest to that of the current peak that meets the peak search conditions.

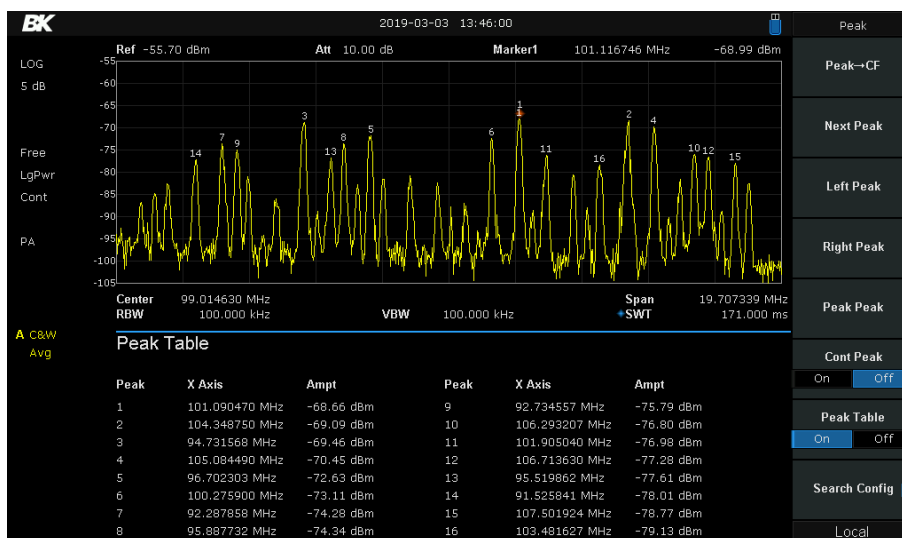


Figure 7.8 Peak detector menu

Left Peak Move to the next peak to the left of the current peak.

Right Peak Move to the next peak to the right of the current peak.

Peak Peak Search for the highest/lowest peak and the minimum measured trace value and mark them with relative value markers. The signal level difference is shown in the upper right corner of the screen.

Count Peak Enable continuous peak searching. When enabled, the system will always execute a peak search automatically after each sweep.

Peak Table Show the table of up to 16 peaks that meet the search condition settings.

7.6.1 Search Config

Define the conditions of peak search for various peak searches. A real peak should meet the requirements of both the “Peak Excursion” and “Peak Threshold” settings. See Figure 7.9, only the 4 peaks that meet the search conditions are marked and listed in the “Peak Table” below the spectrum plot.

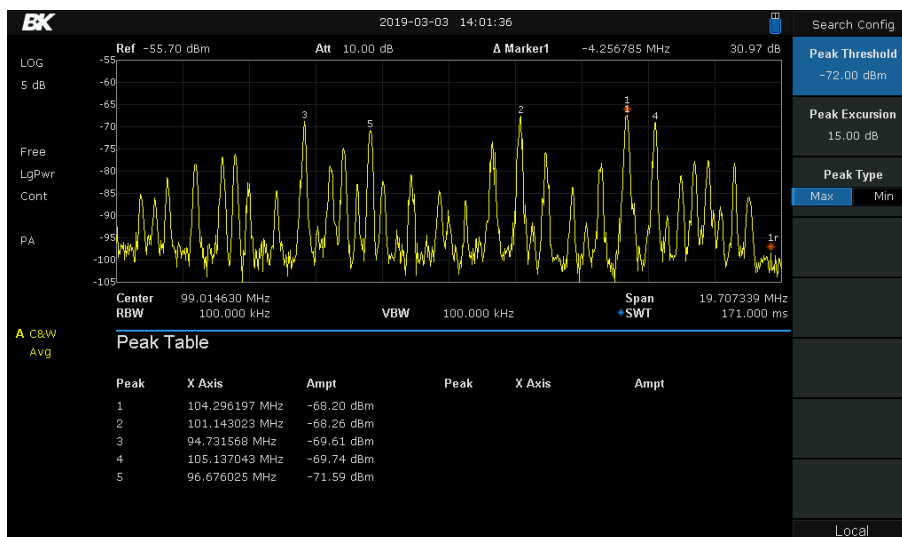


Figure 7.9 Peak search menu

- Peak Threshold** Assign a minimum for the peak amplitude. Peaks whose amplitudes are greater than the specified peak threshold are treated as real peaks.
- Peak Excursion** Set the excursion between the peak and the minimum amplitude on both sides of it. Peaks whose excursions are beyond the specified excursion are treated as real peaks.
- Peak Type** Set the peak search condition. The available options are Maximum and Minimum

System Settings

Set the system parameters.

1 Language

The spectrum Analyzer supports multi-language menu, Chinese and English build-in help and popup messages. Press this key to select the desired display language.

2 Power On/Preset

1Power On/Preset Set the power on setting to " factory (default)", "Last" or one of "user". Set the preset type to factory (default), "Last" or one of "User". Last

When "Last" is selected, settings before the last power-off would be recalled automatically at power on.

User

Select user-defined configuration from "user1" to "user6"

If power on set to user, the device will recall the specified configuration after power on and press Preset at the front panel under any operation interface will recall the specified preset type.

2. USER-DEFINED

Save the current instrument setting as user-defined setting into the internal non-volatile memory. You can store and name up to 6 system states, and name every STA file.

3Factory

When "factory" is selected, the device will recall the initial config.

3 Interface Config

The spectrum Analyzer support communications through LAN, USB as standard interface.

1. LAN

Config or reset corresponding parameters of LAN.

1. Calibration

Auto Cal

When "Auto Cal" open, spectrum Analyzer will process self-calibration regularly. Within half an hour after power-on, the device executes a self-calibration every 10 minutes.

4 System Info

1. System Info

- Product Model , Serial and HOST ID
- Software Version and Hardware Version
- Calibration Date
- Option Information

2. Firmware Update

Update firmware

5 Data and Time

The system time is displayed in “ymd”, “mdy”, “dmy” format in user interface.

6 Self Test

Screen Test

Test whether the screen has a dot defect using five colors: White, Red, Green, Blue and Black. Press any key to switch the screen color and exit the test.

Keyboard Test

Enter the keyboard test interface. Press the function keys at the front panel one by one and observe whether the corresponding key be checked. If not, an error may have occurred in that key. To exit the test, press “<-“ four times.

LCD Test

If the keys at the front panel are transparent, when the key is pressed , the corresponding backlight will turn on when testing it.

8.1 display

Control the screen display of the analyzer, such as setting the display grid brightness.

1Grid brightness

Control the display grid brightness.

Table 2- 36 Grid brightness

Parameter	Explanation
Default	30%
Range	0 ~ 100%
Unit	None
Knob Step	1%
Direction Key Step	1%

2Display Line

Open or Close Display Line or move the location.

1.

8.2 file

1.

8.2.1 Browser

Browser type including “Dir” and “File”,

Dir: when selected, use the knob or direction keys to browser directory in system

File: when selected, use the knob or direction keys to switch among files or folders under the current directory.

8.2.2 Open/Load

Open the current folder or load current file

8.2.3 Type

user can define the file type be browsed and saved, included "all type", "STA", "SET", "TRC", "COR", "LIM", "BMP", "CSV".

8.2.4 Save

Save file in current directory, the file type is set in "Type"

8.2.5 Create Folder

Create a new folder in current directory.

8.2.6 Delete

Delete selected file or directory.

1. Rename

Rename the selected file or folder.

8.2.7 Operate

Open/Load: Open the selected folder or directory, Load the selected file Cut : Cut the Selected file or folder, and delete the primary one after paste Copy : Copy the Selected file or folder for paste.

Paste : Paste the file cut or copied before into the current. Delete : Delete selected file or directory.

8.3 preset

Recall the preset setting and restore the analyzer to a specified status.

- Press **System** ->**Pwr On/Preset .Preset** to select "Def", "Last" or "User".
- Press **Preset** to load the factory settings listed in the following table (except items marked with "***") or User-defined settings.

Table 2-60 Factory Settings

8.4 couple

Set related parameters according to the coupling relationship.

Auto all : Set Related parameters automatically according to the coupling relationship.

RBW

RBW have couple relationship with span. Please refer to the introduction of the "Resolution Bandwidth"

VBW

VBW have coupling relationship with VBW. Please refer to the introduction of "VBW".

3Attenuation

Input attenuation have coupling relation ship with Ref Level, preamp. Please refer to introduction of the "amplitude".

CF step

CF step have coupling relationship with RBW at the zero span, When in none-zero mode, CF step have coupling relationship with Span. please refer to the introduction of the "Freq Step".

Sweep time

Parameter	Default
Frequency	
Center Freq	1.6 GHz (or 1.5 GHz, 1.05 GHz, 900 MHz, 750 MHz, 500 MHz)
Start Freq	0 Hz
Stop Freq	3.2GHz (or 3.0 GHz, 2.1 GHz, 1.8 GHz, 1.5 GHz, 1.0 GHz)
Freq Step	Auto, 320MHz (or 300MHz, 210MHz, 180MHz, 150MHz, 100MHz)
Span	
Span	3.2GHz (or 3.0 GHz, 2.1 GHz, 1.8 GHz, 1.5 GHz ,1.0 GHz)
Amplitude	
Ref Level	0 dBm
Attenuator	Auto, 20 dB
Preamp	Off
Units	dBm
Scale/Div	10 dB
Scale Type	Log
Ref Offset	0 dBm
Corrections	Off
BW	
RBW	Auto, 1MHz
VBW	Auto, 1MHz
VBW/RBW	1
Avg Type	Log Pwr
Sweep	
Sweep Time	Auto, 312.416 ms (or 312.416 ms, 216.288 ms, 192.256 ms, 168.224 ms, 120.160 ms)
Sweep Rule	Speed
Sweep	Continue
Sweep Mode	Auto
Numbers	1
Trig	
Trigger Type	Free Run

Sweep time have coupling relationship with RBW, VBW and span. Please refer to the introduction of "Sweep Time".

8.5 help

After press "Help", press any key to help information.

8.6 save-1

Quick saving a file.

Video Trigger	0 dBm
External Trigger	Rasing
TG	
TG	Off
TG Level	0 dBm
TG Lvl Offset	0 dB
Normalize	Off
Norm Ref Lvl	0 dB
Norm Ref Pos	100%
Ref Trace	Blank
Trace	
Select Trace	A
Trace Type of Trace A	Clear Write
Avg Times	100
Variable X	A
Variable Y	B
Constant	0 dB
Output Z	C
Math Type	Off
Detect	
Select Trace	A
Detect Type of Trace A	Pos Peak
Limit	
Limit1	Off, Limit Upper, 0 dBm
Limit2	Off, Limit Lower, -100 dBm
Test	Stop
Fail to stop	Off
Buzzer	Off
X Axis	Freq
Demod	
Demod Mode	Close
Earphone	Off
Volume	6
Demod Time	5 ms
Marker	
Select Marker	1
Select Trace	A
Marker Type	Normal
Delta Pair	Delta
Relative To	Off
Marker Table	Off
Marker Fctn	44
Select Marker	1

Marker Fn	Off
N dB BW	-3 dB
Read Out	Frequency
Peak	
Cont Peak	Off
Peak Table	Off
Peak Threshold	-140 dBm
Peak Excursion	10 dB
Peak Type	Max
Mode	
Mode	Spec Analyzer
Measure	
Meas Type	Off
Measure Setup	
Channel Power	
Center Freq	1.6 GHz (or 1.5 GHz, 1.05 GHz, 900 MHz, 750 MHz, 500 MHz)
Integration BW	2 MHz
Span	3.2GHz (or 3.0 GHz 2.1 GHz 1.8 GHz 1.5 GHz 1.0 GHz)
ACPR	
Center Freq	1.6 GHz (or 1.5 GHz, 1.05 GHz, 900 MHz, 750 MHz, 500 MHz)
Main Channel	1 MHz
Adjacent Chn	1 MHz
Adj Chn Space	3 MHz
Occupied BW	
Method	dBc 26% 99%
T-Power	
Center Freq	1.6 GHz (or 1.5 GHz, 1.05 GHz, 900 MHz, 750 MHz, 500 MHz)
Start Line	0 s
Stop Line	20 ms
System**	
Language	English
Power On	Def
Preset	Def
IP Config	Static
Auto Cal	Close
Tine Date	On
Set Format	ymd

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B&K Precision Corp. warrants to the original purchaser that its products and the component parts thereof, will be free from defects in workmanship and materials for a period of **three years** from date of purchase.

B&K Precision Corp. will, without charge, repair or replace, at its option, defective product or component parts. Returned product must be accompanied by proof of the purchase date in the form of a sales receipt.

To help us better serve you, please complete the warranty registration for your new instrument via our website www.bk-precision.com

Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. The warranty is void if the serial number is altered, defaced or removed.

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22820 Savi Ranch Parkway
Yorba Linda, CA 92887
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Warranty Service: Please go to the support and service section on our website at bkprecision.com to obtain an RMA #. Return the product in the original packaging with proof of purchase to the address below. Clearly state on the RMA the performance problem and return any leads, probes, connectors and accessories that you are using with the device.

Non-Warranty Service: Please go to the support and service section on our website at bkprecision.com to obtain an RMA #. Return the product in the original packaging to the address below. Clearly state on the RMA the performance problem and return any leads, probes, connectors and accessories that you are using with the device. Customers not on an open account must include payment in the form of a money order or credit card. For the most current repair charges please refer to the service and support section on our website.

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Include with the returned instrument your complete return shipping address, contact name, phone number and description of problem.

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