



Agilent X-Series Signal Analyzer

**This manual provides documentation for the
following X-Series Analyzers:**

**MXA Signal Analyzer N9020A
EXA Signal Analyzer N9010A**

N9061A Remote Language Capability Guide



Notices

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Manual Part Number

N9020-90091
Supersedes: N9020-90080

Print Date

June 2009
Printed in USA

Agilent Technologies, Inc.
1400 Fountaingrove Parkway
Santa Rosa, CA 95403

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1 **Getting Started**

N9061A Application Description

The N9061A application is the remote language compatibility suite for the Agilent Technologies' X-Series of signal analyzers. It allows the analyzers to be controlled using many of the remote programming commands from the following analyzers:

- 8560 E/EC Series Portable Spectrum Analyzers, comprising:
 - 8560E
 - 8560EC
 - 8561E
 - 8561EC
 - 8562E
 - 8562EC
 - 8563E
 - 8563EC
 - 8564E
 - 8564EC
 - 8565E
 - 8565EC

The X-Series analyzer with the N9061A application installed is designed to replace these analyzers in many automated systems with minimal or no modification to the currently used measurement software.

N9061A Limitations

The N9061A application has been designed to emulate as closely as possible the operation of the specified spectrum analyzers. It is not, however, intended as an absolute direct replacement for these analyzers.

Supported commands

Only a subset of the 8560 Series commands is supported in this application (through a GPIB interface). The list of supported commands was determined by feedback from our customers combined with technical considerations and constraints.

EP is the enable parameter in the 8560 series which when used as a secondary keyword after a command, transfers control and allows front panel operator entry. This command is supported in the N9061A application for the same active functions as the 8560 series, but is not displayed in any of the format diagrams for individual commands.

The N9061A application supports the OA parameter which is found in several legacy commands such as AT and CF. OA is the equivalent of a query so that “CF OA” has a return value equivalent to “CF?”.

Device clear is supported by the N9061A application and causes a mode preset of the signal analyzer.

Predefined Functions

In the 8560 Series analyzers, a “predefined function” is an analyzer command that returns a number that can be operated on by other analyzer commands.

“Predefined variables” follow the same idea, except the value to be passed as a parameter to the next command is stored in a variable.

The N9061A application does not support this type of behavior, so any commands that originally acted as predefined functions or variables, or that allowed predefined functions or variables as arguments in the 8560 Series no longer do so.

User-defined Functions

No user-defined functions, traces, or variables (FUNCDEF, TRDEF or VARDEF) can be used as arguments or commands in programs controlling any analyzer running N9061A. In addition, the behavior of certain commands that rely on the “active functions” (UP, DN, etc.) may be slightly different.

Hardware and Firmware Requirements for N9061A

One of the following Agilent signal analyzers is required to run the N9061A application.

Table 1-1 Compatible Agilent EXA Series Signal Analyzers

| Analyzer Model Number | Upper Frequency Limit | Firmware |
|-----------------------|-----------------------|----------------------|
| N9010A-503 | 3.6 GHz | Rev A.01.60 or later |
| N9010A-507 | 7 GHz | Rev A.01.60 or later |
| N9010A-513 | 13.6 GHz | Rev A.01.60 or later |
| N9010A-526 | 26.5 GHz | Rev A.01.60 or later |

Table 1-2 Compatible Agilent MXA Series Signal Analyzers

| Analyzer Model Number | Upper Frequency Limit | Firmware |
|-----------------------|-----------------------|----------------------|
| N9020A-503 | 3.6 GHz | Rev A.01.60 or later |
| N9020A-508 | 8.4 GHz | Rev A.01.60 or later |
| N9020A-513 | 13.6 GHz | Rev A.01.60 or later |
| N9020A-526 | 26.5 GHz | Rev A.01.60 or later |

For maximum compatibility, you should select an X-Series analyzer that equals or exceeds the frequency range of the legacy analyzer you are replacing (currently not possible for the 8564E/EC or 8565E/EC). The frequency limits of the legacy instruments are listed below.

Table 1-3 Frequency Ranges of the Legacy Analyzers

| Remote Language | Start Frequency | Stop Frequency |
|-----------------|-----------------|----------------|
| 8560E/EC | 30 Hz | 2.9 GHz |
| 8561E/EC | 30 Hz | 6.5 GHz |
| 8562E/EC | 30 Hz | 13.2 GHz |
| 8563E/EC | 9 kHz | 26.5 GHz |
| 8564E/EC | 9 kHz | 40.0 GHz |
| 8565E/EC | 9 kHz | 50.0 GHz |

Installing the N9061A application

Remote language compatibility for the 8560 series of analyzers is a licensed application on the X-Series analyzers and is called N9061A-2FP. The application must be installed on the X-Series analyzer and licensed for it to work correctly.

Installation

The N9061A-2FP is installed on the X-Series analyzer in one of the following ways:

- If you purchased a new X-Series analyzer with the N9061A application then the product is installed and licensed and ready to use.
- If you have an X-Series analyzer and have subsequently purchased the N9061A application then you can download the N9061A application from the Agilent website. The N9061A application is installed as part of a software upgrade. See the link below for Signal Analyzers software upgrade site. After upgrading your software you should then use your entitlement certificate to license the product (see [Licensing](#) below).

The latest revision of the software may be downloaded from:

http://www.agilent.com/find/exa_software

http://www.agilent.com/find/mxa_software

NOTE

No calibration is required after the N9061A application is installed.

Licensing

When you order a licensed product, you receive an entitlement certificate. Instructions are provided on your entitlement certificate to direct you to the Web site to redeem your certificate for a license key. You need to provide your instrument product number and serial number, and the entitlement certificate number.

| Required Information: | Front Panel Key Path: |
|---------------------------------------|-------------------------------------|
| Model #: (Ex. N9020A) | |
| Instrument Serial Number: _____ | System > Show > System |

The license is downloaded from the license website onto a USB storage device so that it can be loaded into the instrument.

A license key is usually for one instrument model/serial number combination. The license key can only be installed on that instrument.

License Installation Procedure over USB

1. Redeem the Option Upgrade Entitlement Certificate by following the instructions on the Certificate.
2. After redeeming your Option Upgrade Entitlement Certificate you will receive an e-mail with an attached License File.
3. Locate a USB storage device and save the .lic file to the root directory of the USB storage device.
4. Connect the USB storage device to one of the signal analyzer USB ports. Windows detects the new hardware and may display the configuration menu. This menu may be configured according to your preferences.
5. The signal analyzer automatically consumes the license file. (This may take a few minutes) When the license is consumed the Agilent License Manager displays a “Successful License Installation” message.
6. Alternatively the license file can be manually installed over USB or LAN by placing the license file in the following folder on the signal analyzer.
C:\Program Files\Agilent\licensing

Verify the Installation

1. Press **System > Show > System** to display the list of installed applications.
2. Verify that the new application appears in the list.

If you require further assistance, please contact the Agilent support team.

Online assistance: <http://www.agilent.com/find/assist>

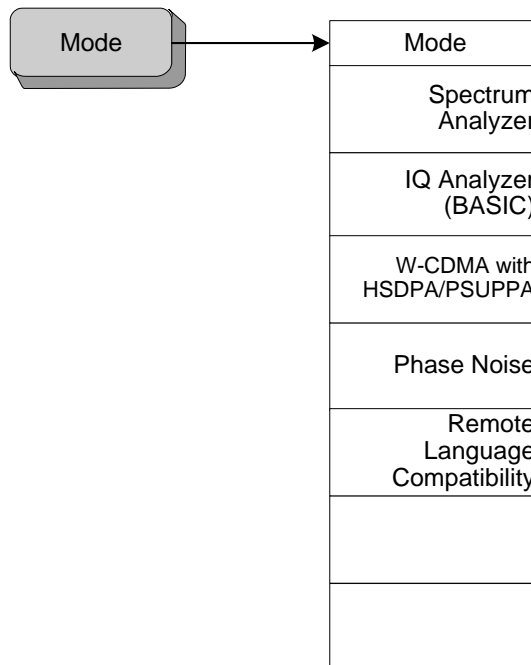
If you do not have access to the Internet, contact your local Agilent Technologies Sales and Service Office, or if in the United States, call 1-800-829-4444.

Setting up N9061A on the X-Series Analyzer

Figure 1-1 is an example mode menu map showing the N9061A (Remote Language Compatibility) application selection on your signal analyzer. To select the N9061A application, press the **Mode** hardkey on the X-Series analyzer front panel and then select the **Remote Language Compatibility** mode. If there are more than six modes on the signal analyzer, then use the More button to find the Remote Language Compatibility selection.

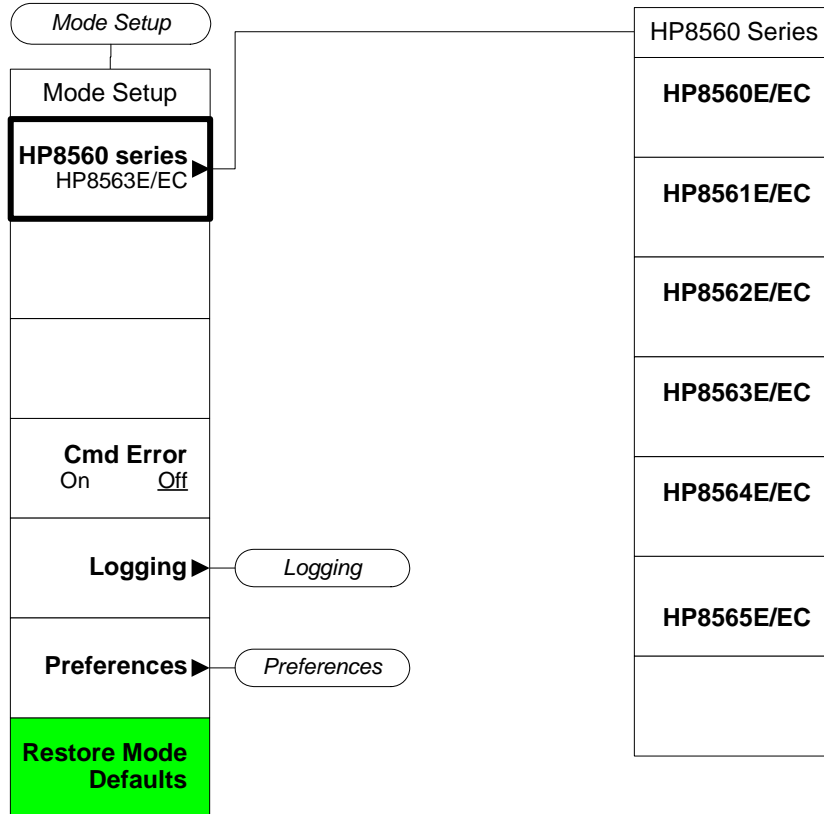
Figure 1-1

Example Mode Menu Map for X-Series Analyzers



Then, to select the legacy analyzer you wish to emulate, press the **Mode Setup** hardkey on the front panel. [Figure 1-2](#) shows the menu map that allows you to select the 8560 series analyzer and therefore the remote control commands to be used in the X-Series analyzer.

Figure 1-2 Mode Setup > Legacy Instrument Selection Menu Map



The HP8560 series key allows you to select which legacy instrument to emulate. The selected instrument determines the response to the “ID?” command and affects the behavior of commands such as IP. A customer can use any command offered by any of the legacy instruments regardless of the language setting. However, if the command is not correct for the selected legacy instrument there is no guarantee that the command will work as expected. This does not affect the response to the SCPI command “*IDN?”.

The legacy instrument selections are as follows:

| | |
|----------|---|
| 8560E/EC | Selects the 8560E/EC remote programming language and sets the response to the remote programming command 'ID?' to HP8560E . It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-4 . |
| 8561E/EC | Selects the 8561E/EC remote programming language and sets the response to the remote programming command 'ID?' to HP8561E . It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-4 . |
| 8562E/EC | Selects the 8562E/EC remote programming language and sets the response to the remote programming command 'ID?' to HP8562E . It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-4 . |
| 8563E/EC | Selects the 8563E/EC remote programming language and sets the response to the remote programming command 'ID?' to HP8563E . It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-4 . This is the default setting for the N9061A application. |
| 8564E/EC | Selects the 8564E/EC remote programming language and sets the response to the remote programming command 'ID?' to HP8564E . It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-4 . |
| 8565E/EC | Selects the 8565E/EC remote programming language and sets the response to the remote programming command 'ID?' to HP8565E . It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-4 . |

Table 1-4 Span, Trace Points, Couplings, VBW/RBW Ratio, and Span/RBW Ratio Settings

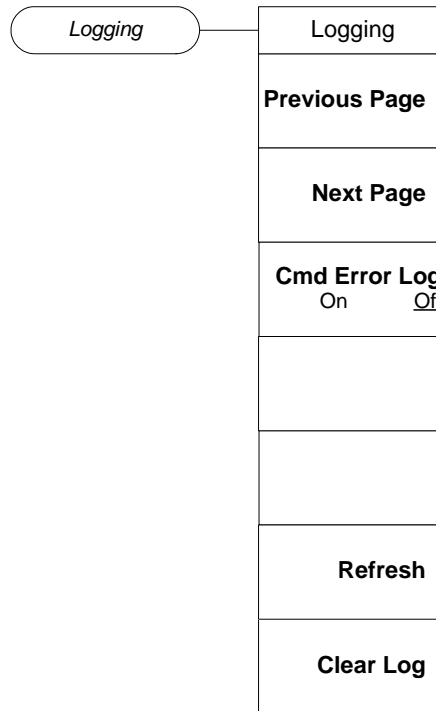
| Remote Language | Start Freq. | Stop Freq. | Number of Trace Points | RF Coupling | VBW/RBW Ratio | Span/RBW Ratio |
|-----------------|-------------|------------|------------------------|-------------|---------------|----------------|
| 8560E/EC | 30 Hz | 2.9 GHz | 601 | AC | 1 | 91 |
| 8561E/EC | 30 Hz | 6.5 GHz | 601 | AC | 1 | 91 |
| 8562E/EC | 30 Hz | 13.2 GHz | 601 | AC | 1 | 91 |
| 8563E/EC | 30 Hz | 26.5 GHz | 601 | DC | 1 | 91 |
| 8564E/EC | 30 Hz | 40 GHz | 601 | DC | 1 | 91 |
| 8565E/EC | 30 Hz | 50 GHz | 601 | DC | 1 | 91 |

Logging

The N9061A application allows the logging of errors. These errors comprise details of command errors and legacy commands that have been received but are not supported by the N9061A application. To enable and view the error log select the **Mode Setup** hardkey from the front panel. Then select the **Logging** softkey.

Figure 1-3

Logging Menu Map



When you are in the Logging menu, the main Signal Analysis display is obscured by the logging page. **Previous Page** and **Next Page** allow you to scroll through the log file. To include commands sent to the analyzer since the log window display was opened, press **Refresh**.

The **Cmd Error Log** option allows you to turn the command error logging on or off. The default is **Off**. Logging should not be used in a secure environment. When set to **On**, all error messages are stored in a log file, regardless of whether they have been displayed on the screen. When set to **Off**, no further command error messages are written to the log file.

Switching **Cmd Error Log** to **Off** does not clear the log file. Only the **Clear Log** softkey clears the error log.

To update the log page with new entries, select **Refresh**.

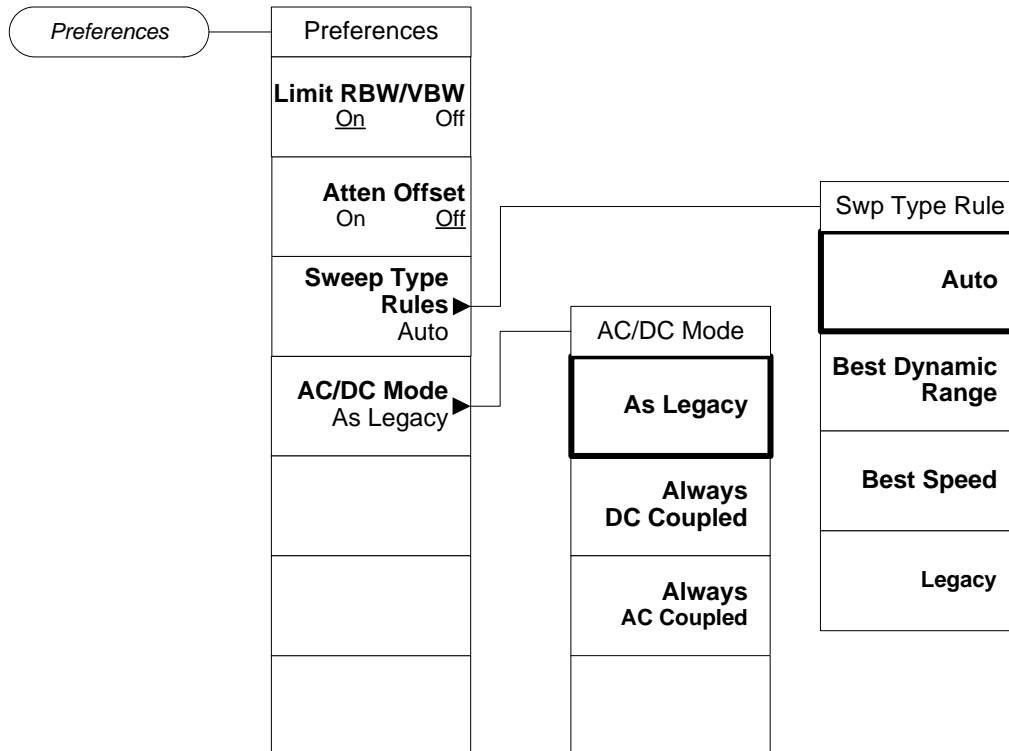
The log file is also stored as a text file, called `Logfile.txt`, on the instrument; it is stored in the `D:\` drive, in a folder called `\User_My_Documents\[USERNAME]\My Documents\RLC\data`.

The log is cleared on power-up, or if you change the remote language selection. The maximum size of the log is 10 MB. When the file reaches its maximum size, the first ten percent of the file is automatically discarded, in order to clear space for subsequent error messages.

Preferences

The Preferences menu allows you to configure some analyzer settings when in remote language compatibility mode. Figure 1-4 shows the Preferences menu map which is accessed by selecting the **Mode Setup** hardkey on the front panel and then selecting the **Preferences** softkey. Preferences are not affected by a power cycle, a remote language change or a mode preset. They are only preset to their default state using **Restore Mode Defaults** key in the Mode Setup menu (see Figure 1-2).

Figure 1-4 Preferences Menu Map



Setting **Limit RBW/VBW** to **On** limits the valid resolution bandwidth (RBW) and video bandwidth (VBW) values to those appropriate for the currently selected remote language. While this limitation reduces measurement flexibility, it helps to ensure that the measurement time in emulation mode is the same as the legacy measurement time, and ensures that the responses to RBW and VBW match the legacy instrument. The default state is **Off**. Setting this key to **Off** causes the RBW and VBW filters to use the X-Series analyzer range of values for all remote languages.

Setting **Atten Offset** to **On** allows larger input power to be applied to the analyzer, while significantly increasing the noise floor. Since many of the older spectrum analyzers had noise floor 10 dB higher than the X-Series analyzer, this gives the most accurate emulation. The default state is **Off**.

Sweep Type Rules changes the Auto rules for determining whether the instrument uses FFT or Swept mode (this can be manually overridden). FFT mode offers substantially faster measurements in some cases. 8560-series analyzers use both FFT and Swept mode, in which case “Legacy” is equivalent to “Dynamic range”.

AC/DC Mode allows the user to override the legacy instrument behavior for AC and DC coupling. This command is required because legacy instruments had AC cutoff frequencies of 100 kHz and the X-series analyzers have an AC cutoff frequency of 10 MHz.

Running Software that Requires SCPI Commands

When a legacy remote language has been selected, you only have access to a very small subset of SCPI commands. If you are not familiar with the SCPI remote programming language, [Chapter 5](#), “A Brief Introduction to the SCPI Language,” on page 223 contains some useful information.

The SCPI commands available while using other remote languages are:

Table 1-5 SCPI Commands

| SCPI Commands | Description |
|---|--|
| *IDN? | Queries and returns the instrument identification string. |
| *RST | Performs an instrument preset. |
| INSTRument:DEFault | Restores mode defaults. |
| INSTRument:SElect INSTRument:SElect? | Selects an application by mode name. (Use RLC to select the N9061A application) ^a . |
| INSTRument:NSElect INSTRument:NSElect? | Selects an application by mode number. (Use 266 to select the N9061A application) ^a . |
| [:SENSe]:SWEep:TYPE AUTO SWEep FFT [:SENSe]:SWEep:TYPE? | Sets the Sweep Type. Defaults to AUTO. |
| :SYSTem:OPTions? | Returns a list of installed options. |
| INPut:COUPling AC DC RLC INPut:COUPling? | Sets the input coupling. ^b Defaults to RLC. |
| :SYSTem:LANGUage HP8560E HP8561E HP8562E HP8563E HP8564E HP8565E :SYSTem:LANGUage? | Sets the current remote language. ^b |
| [:SENSe]:RLC:SWEep:TYPE:AUTO:RULEs AUTO SPEed DRANge LEGACY [:SENSe]:RLC:SWEep:TYPE:AUTO:RULEs? | Sets the auto rule setting for Sweep Type. ^b |
| [:SENSe]:RLC:BANDwidth:LIMit ON OFF 1 0 [:SENSe]:RLC:BANDwidth:LIMit? | Toggles legacy bandwidth limiting on and off. ^b |
| [:SENSe]:RLC:ATTenuation:STATE ON OFF 1 0 [:SENSe]:RLC:ATTenuation:STATE? | Toggles internal attenuation on and off. ^b Defaults to OFF. |

a. After changing into or out of RLC mode, allow a 1s delay before sending subsequent commands.

b. This command is only available if the N9061A application is installed on your analyzer.

Service and Calibration

Since the Performance Verification and Adjustment Software uses the SCPI command language, you need to leave the N9061A (RLC) application and change to the Spectrum Analyzer application prior to calibration or service of your Agilent signal analyzer.

Documentation for the N9061A application

Signal Analyzers with N9061A

When you purchase your X-Series signal analyzer with the Remote Language Compatibility Suite (N9061A), this manual - the *Remote Language Compatibility Guide* (N9020-90080) is included on the documentation CD and is installed on the analyzer in the online help.

For information on EXA series analyzers and other related documentation, refer to the EXA web site at <http://www.agilent.com/find/exa/>.

For information on MXA series analyzers and other related documentation, refer to the MXA web site at <http://www.agilent.com/find/mxa/>.

This *Remote Language Compatibility Guide* is not designed to be a comprehensive guide to all legacy commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring your existing code to your X-Series analyzer. For a fuller description of these commands, refer to the manuals supplied with your original analyzer.

Signal Analyzer Updates

For the latest information about this instrument, including software upgrades, application information, and product information, please visit the URL below.

<http://www.agilent.com/find/mxa/>

2 Legacy Analyzer Command List

Table of All Legacy Analyzer Commands

The following table lists all of the original programming commands from the legacy analyzers (that is, the 8560 Series), and indicates which are supported in N9061A. Refer to the alphabetical listing of commands in [Chapter 4](#), “Programming Commands,” on page 47 for more detailed information about each supported command.

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|------------|---|---------------------|--------------------------|
| A1 | Clear-writes trace A | Yes | Page 51 |
| A2 | Max Holds trace A | Yes | Page 52 |
| A3 | View trace A | Yes | Page 53 |
| A4 | Blanks trace A | Yes | Page 54 |
| ABORT | Interrupt operation of all user-defined functions | No | |
| ABS | Absolute | No | |
| ACPACCL | Accelerate adjacent channel power measurement | No | |
| ACPALPHA | Adjacent channel power alpha weighting | Yes | Page 55 |
| ACPALTCH | Adjacent channel power alternate channels | Yes | Page 56 |
| ACPBPER | Adjacent channel power burst period | Yes | Page 57 |
| ACPBWID | Adjacent channel power burst width | Yes | Page 58 |
| ACPBW | Specifies channel bandwidth for ACP measurement | Yes | Page 59 |
| ACPCOMPUTE | Compute adjacent channel power | Yes | Page 60 |
| ACPFQWT | Adjacent channel power frequency weighting | Yes | Page 61 |
| ACPGRAPH | Compute adjacent channel power graph | No | |
| ACPLOWER | Lower adjacent channel power | Yes | Page 62 |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|----------------|---|----------------------------|---------------------------------|
| ACPMAX | Maximum adjacent channel power | Yes | Page 63 |
| ACPMEAS | Measure adjacent channel power | Yes | Page 64 |
| ACPMETHOD | Adjacent channel power measurement method | No | |
| ACPMSTATE | Adjacent channel power measurement state | Yes | Page 65 |
| ACPPWRTX | Total power transmitted | Yes | Page 66 |
| ACPRSLTS | Adjacent channel power measurement results | Yes | Page 67 |
| ACPSP | Channel spacing | Yes | Page 68 |
| ACPT | Adjacent channel power T weighting | Yes | Page 69 |
| ACPUPPER | Upper adjacent channel power | Yes | Page 70 |
| ACTVFUNC | Creates a user defined active function | No | |
| ADD | Add | No | |
| ADJALL | LO & IF adjustment | Yes | Page 71 |
| ADJCRT | Adjust CRT alignment | No | |
| ADJIF | Adjust IF | No | |
| AMB | Trace A – trace B -> trace A | Yes | Page 72 |
| AMBPL | Trace A – trace B + Display Line -> trace A | Yes | Page 73 |
| AMPCOR | Applies amplitude correction at specified frequencies | No | |
| AMPCORDATA | Amplitude correction data | No | |
| AMPCORSAVE | Save amplitude correction data | No | |
| AMPCORSIZE | Amplitude correction data array size | No | |
| AMPCORRCL | Amplitude correction recall | No | |
| ANNOT | Display Annotation | Yes | Page 74 |

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|-----------|--|---------------------|--------------------------|
| APB | Trace A + trace B -> trace A | Yes | Page 75 |
| ARRAYDEF | Defines an array | No | |
| AT | Input Attenuation | Yes | Page 76 |
| AUNITS | Amplitude Units | Yes | Page 77 |
| AUTOCPPL | Auto couple | Yes | Page 78 |
| AUTOEXEC | Turns on or off the function defined with AUTOFUNC | No | |
| AUTOFUNC | Defines a function for automatic execution | No | |
| AUTOSAVE | Automatically saves trace | No | |
| AVG | Average | No | |
| AXB | Exchange Traces A & B | Yes | Page 79 |
| B1 | Clear-writes trace B | Yes | Page 80 |
| B2 | Max Holds trace B | Yes | Page 81 |
| B3 | View trace B | Yes | Page 82 |
| B4 | Blanks trace B | Yes | Page 83 |
| BL | Trace B – Display line -> trace B | Yes | Page 84 |
| BLANK | Blanks specified trace | Yes | Page 85 |
| BML | Trace B – Display line -> trace B | Yes | Page 86 |
| C1 | Turns off A - B | Yes | Page 87 |
| C2 | A – B -> A | Yes | Page 88 |
| CA | Couples Attenuation | Yes | Page 89 |
| CARDLOAD | Copies data from memory card to module memory | No | |
| CARDSTORE | Copies data to memory card | No | |
| CARROFF | Carrier off power | Yes | Page 90 |
| CARRON | Carrier on power | Yes | Page 91 |
| CATALOG | Catalog | No | |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|----------------|---|----------------------------|---------------------------------|
| CF | Center Frequency | Yes | Page 92 |
| CHANNEL | Channel selection | Yes | Page 93 |
| CHANPWR | Channel power | Yes | Page 94 |
| CHPWBRW | Channel power bandwidth | Yes | Page 95 |
| CLRDSP | Clear display | No | |
| CLRSCHED | Clears autosave & autoexec schedule buffer | No | |
| CLRW | Clear-writes specified trace | Yes | Page 96 |
| CNTLA | Auxiliary interface control line A | No | |
| CNTLB | Auxiliary interface control line B | No | |
| CNTLC | Auxiliary interface control line C | No | |
| CNTLD | Auxiliary interface control line D | No | |
| CNTLI | Auxiliary interface control line input | No | |
| CNVLOSS | Selects ref level offset to calibrate amplitude display | No | |
| CONTS | Continuous sweep mode | Yes | Page 98 |
| COUPLE | Selects AC or DC coupling | Yes | Page 99 |
| CR | Couples Resolution BW | Yes | Page 100 |
| CS | Couples Step Size | Yes | Page 101 |
| CT | Couples Sweep Time | Yes | Page 102 |
| CTRLHPIB | Allows SA to control HP-IB | No | |
| CV | Couples Video Bandwidth | Yes | Page 103 |
| DATEMODE | Set the date display format | No | |
| DELMKBW | Occupied power bandwidth within delta marker | Yes | Page 104 |
| DEMOMD | Turns the demodulator on or off | No | |

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|----------|--|---------------------|--------------------------|
| DEMODAGC | Demodulation automatic gain control | No | |
| DEMODT | Demodulation time | No | |
| DET | Detection Mode | Yes | Page 105 |
| DISPOSE | Frees Memory | No | |
| DIV | Divide | No | |
| DL | Display Line Level | Yes | Page 106 |
| DLYSWP | Delay sweep | Yes | Page 107 |
| DONE | Synchronizing function | Yes | Page 108 |
| DSPLY | Display | No | |
| E1 | Active marker to maximum signal | Yes | Page 109 |
| E2 | Active marker to center frequency | Yes | Page 110 |
| E3 | Active marker frequency to CF step size | Yes | Page 111 |
| E4 | Active marker to reference level | Yes | Page 112 |
| EDITDONE | Indicates limit line editing is complete | No | |
| EDITLIML | Allows current limit line to be edited | No | |
| ELSE | Conditional Programming (If...then...else...endif) | No | |
| EM | Erase user display memory | No | |
| ENTER | Enter from HP-IB | No | |
| ERR | Queries the error queue | Yes | Page 113 |
| ET | Elapsed time | Yes | Page 115 |
| EX | Exchanges trace A & B | Yes | Page 116 |
| EXP | Exponential | No | |
| EXTMXR | Presets external mixing mode | No | |
| FA | Start frequency | Yes | Page 117 |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|----------------|---|----------------------------|---------------------------------|
| FB | Stop frequency | Yes | Page 118 |
| FDIAG | Frequency diagnostics | No | |
| FDSP | Frequency display off | Yes | Page 119 |
| FFT | Fast fourier transform | No | |
| FOFFSET | Frequency offset | Yes | Page 120 |
| FORMAT | Erase & format the selected memory device | No | |
| FREF | Frequency reference | Yes | Page 121 |
| FS | Full frequency span | Yes | Page 122 |
| FULBAND | Set start/stop freq for ext mixing bands | No | |
| FUNCDEF | Function definition | No | |
| GATE | Turn time-gating on or off | Yes | Page 124 |
| GATECTL | Gate control | Yes | Page 125 |
| GD | Gate delay | Yes | Page 126 |
| GL | Gate length | Yes | Page 127 |
| GP | Sets the polarity (positive/negative) of the gate trigger | Yes | Page 128 |
| GRAT | Graticule on/off | Yes | Page 129 |
| HD | Holds data entry | Yes | Page 130 |
| HNLOCK | Harmonic lock | No | |
| HNUNLK | Harmonic band unlock | No | |
| ID | Instrument identification | Yes | Page 133 |
| IDCF | Identified signal to center frequency | No | |
| IDFREQ | Identified signal frequency | No | |
| IF | Conditional Programming (If...then...else...endif) | No | |
| INT | Integer | No | |
| IP | Instrument preset | Yes | Page 134 |

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|-----------|--|---------------------|--------------------------|
| KEYCLR | Clear user defined keys | No | |
| KEYDEF | Assign function to soft key | No | |
| L0 | Turns off the display line | Yes | Page 135 |
| LB | Writes text label | No | |
| LCLVAR | Defines a local variable for use | No | |
| LG | Selects log scale | Yes | Page 136 |
| LIMD | Delta amplitude value for limit line segment | No | |
| LIMF | Frequency value for limit-line segment | No | |
| LIMIFAIL | Limit line fail | No | |
| LIMIPURGE | Disposes of current limit line, not limit line table | No | |
| LIMIRCL | Load stored limit line into limit line table | No | |
| LIMIREL | Determine whether limit line values absolute/relative | No | |
| LIMISAV | Save contents of limit line table for recall | No | |
| LIMITEST | Compare active trace data to limit line parameters | No | |
| LIML | Amplitude value for limit line segment in lower limit line | No | |
| LIMM | Middle amplitude value for limit-line segment | No | |
| LIMTFL | Specifies a flat limit-line segment | No | |
| LIMTSL | Specifies a sloped limit-line segment | No | |
| LIMU | Amplitude value for limit line segment in upper limit line | No | |
| LN | Selects linear scale | Yes | Page 137 |
| LOG | Log | No | |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
 Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|----------------|---|----------------------------|---------------------------------|
| M1 | Turns off all markers | Yes | Page 138 |
| M2 | Marker Normal | Yes | Page 139 |
| M3 | Marker Delta | Yes | Page 140 |
| MA | Returns the amplitude of active marker | Yes | Page 142 |
| MBIAS | Mixer bias | No | |
| MEAN | Returns mean value of trace in display units | Yes | Page 143 |
| MEANPWR | Mean power measurement | Yes | Page 144 |
| MEAS | Measurement status | Yes | Page 145 |
| MEM | Returns amount of memory available | No | |
| MENU | Menu | No | |
| MF | Returns frequency of the active marker | Yes | Page 146 |
| MIN | Minimum | No | |
| MINH | Min Hold | Yes | Page 147 |
| MKA | Amplitude of the active marker | Yes | Page 148 |
| MKBW | Marker bandwidth | Yes | Page 149 |
| MKCF | Moves the active marker to center frequency | Yes | Page 150 |
| MKCHEDGE | Marker to channel edge | No | |
| MKD | Delta marker | Yes | Page 151 |
| MKDELCHBW | Delta markers to channel power bandwidth | No | |
| MKDR | Reciprocal of marker delta | No | |
| MKF | Specifies the frequency of the active marker | Yes | Page 153 |
| MKFC | Turns the marker frequency counter on or off | Yes | Page 154 |
| MKFCR | Specifies the marker frequency counter resolution | Yes | Page 155 |

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|---------|--|---------------------|--------------------------|
| MKMCF | Marker mean to center frequency | No | |
| MKMIN | Moves active marker to minimum signal detected | Yes | Page 156 |
| MKN | Normal marker | Yes | Page 157 |
| MKNOISE | Marker noise function | Yes | Page 158 |
| MKOFF | Turns all markers or the active marker off | Yes | Page 159 |
| MKPK | Marker peak | Yes | Page 160 |
| MKPT | Marker peak threshold | Yes | Page 161 |
| MKPX | Marker peak excursion | Yes | Page 162 |
| MKRL | Moves the active marker to reference level | Yes | Page 163 |
| MKSP | Marker span | Yes | Page 164 |
| MKSS | Marker step size | Yes | Page 165 |
| MKT | Position marker in units of time | Yes | Page 166 |
| MKTRACK | Turns the marker signal track on or off | Yes | Page 167 |
| ML | Mixer Level | Yes | Page 168 |
| MOD | Modulo | No | |
| MODRCLT | Recalls trace from module memory | No | |
| MODSAVT | Saves trace in module memory | No | |
| MOV | Move | No | |
| MPY | Multiply | No | |
| MSDEV | Specifies mass storage device | No | |
| MT0 | Turns off marker signal track | Yes | Page 169 |
| MT1 | Turns on marker signal track | Yes | Page 170 |
| MXM | Maximum | No | |
| MXMH | Max Hold | Yes | Page 171 |
| MXRMODE | Mixer mode | No | |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|----------------|---|----------------------------|---------------------------------|
| NORMLIZE | Normalize trace data | Yes | Page 172 |
| NRL | Normalized reference level | Yes | Page 173 |
| NRPOS | Normalized reference position | Yes | Page 174 |
| OCCUP | Percent occupied power bandwidth | Yes | Page 175 |
| ONEOS | On end of sweep | No | |
| OP | Output parameters | No | |
| OR | Set position of origin | No | |
| OUTPUT | Output - sending data to the GPIB from function | No | |
| PA | Plot absolute | No | |
| PD | Pen down | No | |
| PDA | Probability distribution amplitude | No | |
| PDF | Probability distribution frequency | No | |
| PEAKS | Sorts the signal peaks by amplitude/frequency | No | |
| PLOT | Prints the screen | Yes | Page 176 |
| PLOTORG | Display origins | No | |
| PLOTSRC | Plot source | No | |
| PP | Peaks the preselector | Yes | Page 177 |
| PR | Plot relative | No | |
| PRINT | Print | Yes | Page 178 |
| PSDAC | Preselector DAC number | No | |
| PSTATE | Protect state | No | |
| PU | Pen up | No | |
| PWRBW | Power bandwidth | Yes | Page 179 |
| RB | Resolution bandwidth | Yes | Page 180 |
| RBR | Resolution bandwidth/Span ratio | Yes | Page 181 |

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|----------|---|---------------------|--------------------------|
| RC | Recalls state register | Yes | Page 182 |
| RCLOSCAL | Recall open/short average | No | |
| RCLS | Recall state | Yes | Page 183 |
| RCLT | Recall trace | No | |
| RCLTHRU | Recall internal thru-reference trace into trace B | No | |
| RELHPIB | Release control of GPIB | No | |
| REPEAT | Conditional Programming (Repeat .. Until ...) | No | |
| RETURN | Return to user defined function origination point | No | |
| REV | Returns the revision string to the controller | Yes | Page 184 |
| RL | Reference level | Yes | Page 185 |
| RLCAL | Reference level calibration | No | |
| RMS | Root mean square | No | |
| ROFFSET | Reference level offset | Yes | Page 186 |
| RQS | SRQ mask | Yes | Page 187 |
| S1 | Continuous sweep mode | Yes | Page 188 |
| S2 | Single sweep mode | Yes | Page 189 |
| SADD | Adds a limit line segment | No | |
| SAVES | Saves analyzer state to specified register | Yes | Page 190 |
| SAVET | Save trace | No | |
| SDEL | Deletes a limit line segment | No | |
| SDON | Indicates limit line segment is done | No | |
| SEDI | Edits limit line segment | No | |
| SENDER | Segment entry for frequency limit lines | No | |
| SER | Serial number | Yes | Page 191 |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|-----------|---|---------------------|--------------------------|
| SETDATE | Set the date of analyzer | Yes | Page 192 |
| SETTIME | Set the time of analyzer | Yes | Page 193 |
| SHOWMENU | Shows menu | No | |
| SIGID | External mixing frequency bands signal identifier | No | |
| SKYCLR | Clears user softkey | No | |
| SKYDEF | Defines user softkey | No | |
| SMOOTH | Smooths given trace over specified number points | No | |
| SNGLS | Single sweep mode | Yes | Page 194 |
| SP | Frequency Span | Yes | Page 195 |
| SQR | Square root | No | |
| SQUELCH | Adjusts squelch level | No | |
| SRCALC | Selects internal or external level control | No | |
| SRCCRSTK | Coarse tracking adjust | No | |
| SRCFINTK | Fine tracking adjust | No | |
| SRCPOFS | Offset source power level | No | |
| SRCPSTP | Select source power step size | No | |
| SRCPSWP | Select sweep range of source output | No | |
| SRCPWR | Select source power level | No | |
| SRCTKPK | Auto adjust tracking of source output with SA sweep | No | |
| SRQ | Service request | Yes | Page 196 |
| SS | Frequency Step Size | Yes | Page 197 |
| ST | Sweep Time | Yes | Page 198 |
| STB | Status byte query | Yes | Page 199 |
| STDEV | Standard deviation of trace amplitude | No | |
| STOREOPEN | Save current instrument state | No | |

Table 2-1 Alphanumeric List of all 8560 series Legacy Commands Showing their N9061A Support

| Command | Description | Supported by N9061A | Page for Further Details |
|------------|--|---------------------|--------------------------|
| STORESHORT | Store short | No | |
| STORETHRU | Store thru-calibration trace in trace B | No | |
| SUB | Subtract | No | |
| SUM | Sum of trace element amplitudes in display units | Yes | Page 200 |
| SUMSQR | Squares trace element amplitudes & returns sum | No | |
| SV | Saves state | Yes | Page 201 |
| SWPCPL | Sweep couple | Yes | Page 202 |
| SWPOUT | Sweep output | No | |
| T1 | Sets the trigger mode to free run | Yes | Page 203 |
| T2 | Sets the trigger mode to line | Yes | Page 204 |
| T3 | Sets the trigger mode to external | Yes | Page 205 |
| T4 | Sets the trigger mode to video | Yes | Page 206 |
| TA | Returns trace A amplitude values to controller | Yes | Page 207 |
| TB | Returns trace B amplitude values to controller | Yes | Page 208 |
| TDF | Trace data format | Yes | Page 209 |
| TEXT | Writes text on the analyzer screen | No | |
| TH | Threshold | Yes | Page 210 |
| THEN | Conditional Programming (If...then...else...endif) | No | |
| TIMEDATE | Allows setting of time & date for analyzer | Yes | Page 211 |
| TITLE | Title entry | Yes | Page 212 |
| TM | Trigger Mode | Yes | Page 213 |
| TRA | Returns trace A amplitude values to controller | Yes | Page 214 |

**Table 2-1 Alphanumeric List of all 8560 series Legacy Commands
Showing their N9061A Support**

| Command | Description | Supported by N9061A | Page for Further Details |
|----------------|---|----------------------------|---------------------------------|
| TRB | Returns trace B amplitude values to controller | Yes | Page 215 |
| TRDEF | Trace define | No | |
| TRIGPOL | Trigger polarity | Yes | Page 216 |
| TS | Takes a sweep | Yes | Page 217 |
| TWNDOW | Formats trace information for FFT. | No | |
| UNTIL | Conditional Programming (Repeat...Until...) | No | |
| VARDEF | Variable definition | No | |
| VARIANCE | Returns the amplitude variance of specified trace | No | |
| VAVG | Turns video averaging on or off | Yes | Page 218 |
| VB | Video Bandwidth | Yes | Page 219 |
| VBR | Video Bandwidth Ratio | Yes | Page 220 |
| VIEW | Stores and views the specified trace | Yes | Page 221 |
| VTL | Video trigger level | Yes | Page 222 |

Legacy Analyzer Command List
Table of All Legacy Analyzer Commands

3 Hints and Tips

This chapter includes a list of helpful hints and tips that will help you get the most from the N9061A application on your X-Series analyzer.

Hints and Tips

These pages lists a few hints and tips that will help you get the most from your analyzer and the N9061A application.

- **Compatibility - speed and consistency** - for best compatibility with your legacy analyzer, the N9061A application should be used on the analyzer whose frequency range most closely matches the frequency range of your legacy analyzer. For example, the best match for the 8563E with its 26.5 GHz upper frequency limit is the MXA N9020A - 526 analyzer which also has an upper frequency limit of 26.5 GHz.
- **Sweep Times** -When analyzing stationary signals, you can change to the Best Speed setting, which is accessed from the **Mode Setup > Preferences > Swp Type Rule** menu. This results in faster sweep times on a X-Series analyzer than on the legacy analyzers because of the X-Series analyzer's better performance. In the majority of applications, this faster speed would be desirable, but that is not always the case.
- **Time-out** - Agilent recommends increasing the timeout on a serial poll (**SPOLL**) due to differences in Sweep Times on some settings. Note, however, that this may not be necessary when using the Best Speed setting on the **Preferences > Swp Type Rule** menu (accessed from the Mode Setup hardkey).
- **Synchronization (1)** - to synchronize after an IP command, Agilent recommends that you use the DONE command. We also suggest that the DONE command is used in conjunction with a timeout of about 5 seconds in case the analyzer starts to auto align. Alternatively, you could set auto alignment to Off. To set auto alignment to Off, press **System, Alignments, Auto Align** on the front panel.
- **Synchronization (2)** - Agilent recommends that synchronization (using the DONE command) is used with marker functions when signal tracking is turned on.
- **Changing Modes** - After changing into or out of RLC mode, allow at least a 1 second delay before sending subsequent commands.
- **AC and DC Coupling** - The 8560 Series of legacy analyzers have one RF input port, and support AC and DC coupling through the COUPLE command (page 99).

WARNING

If the input signal to the X-series analyzer has a DC component, then ensure that when you select a legacy instrument with a possible coupling change to DC, the input signal does not exceed the input specifications of the X-series analyzer.

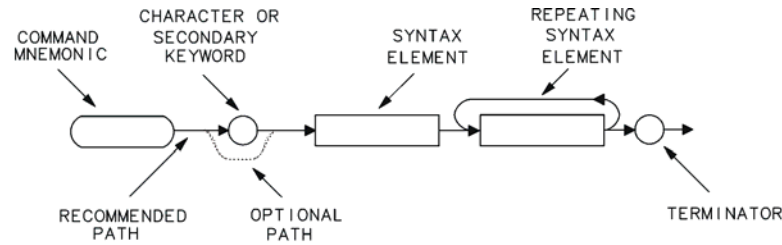
The X-series analyzers also have one RF input port. When using the X-Series analyzers, you must use DC coupling to see calibrated frequencies of less than 20 MHz. Signals of less than 20 MHz are not calibrated when using AC coupling on these analyzers.

4 Programming Commands

This chapter lists all the supported 8560 Series compatible commands in alphanumeric order, and gives brief details on their syntax and operation. For more detailed information on these commands, see your 8560 Series User's Guide.

Command Syntax

Command syntax is represented pictorially.



cu114e

- Ovals enclose command mnemonics. The command mnemonic must be entered as shown with the exception that the case can be upper or lower.
- Circles and ovals surround secondary keywords or special numbers and characters. The characters in circles and ovals are considered reserved words and must be entered as shown with the exception that the case can be upper or lower.
- Rectangles contain the description of a syntax element defined in [Table 4-1, “Syntax Elements.”](#)
- A loop above a syntax element indicates that the syntax element can be repeated.
- Solid lines represent the recommended path.
- Dotted lines indicate an optional path for bypassing secondary keywords or using alternate units.
- Arrows and curved intersections indicate command path direction.
- Semicolons are the recommended command terminators. Using semicolons makes programs easier to read, prevents command misinterpretation, and is recommended by IEEE Standard 728.

NOTE

Uppercase is recommended for entering all commands unless otherwise noted.

Syntax Elements are shown in the syntax diagrams as elements within rectangles. In the syntax diagrams, characters and secondary keywords are shown within circles or ovals.

Table 4-1 Syntax Elements

| Syntax Component | Definition/Range |
|--------------------|--|
| Analyzer command | Any analyzer command in this chapter, with required parameters and terminators. |
| Character | S _p a b c d e f g h i j k l m n o p q r s t u v w x y z databyte. |
| Character & EOI | 8-bit byte containing only character data and followed by end-or-identify (EOI) condition, where the EOI control line on GPIB is asserted to indicate the end of the transmission. END signifies the EOI condition. |
| Character string | A list of characters. |
| Data byte | 8-bit byte containing numeric or character data. |
| Data byte & EOI | 8-bit byte containing numeric or character data followed by end-or-identify (EOI) condition, where the EOI control line on GPIB is asserted to indicate the end of the transmission. END signifies the EOI condition. |
| Delimiter | \ @ ^ \$ % ; ! Matching characters that mark the beginning and end of a character string, or a list of analyzer commands. Choose delimiting characters that are not used within the string they delimit. |
| Digit | 0 1 2 3 4 5 6 7 8 9 |
| lsb length | Represents the least significant byte of a two-byte word that describes the number of bytes returned or transmitted. See msb length. |
| msb length | Represents the most significant byte of a two-byte word that describes the number of bytes returned or transmitted. See lsb length. |
| Number | Expressed as integer, decimal, or in exponential (E) form. Real Number Range: $\pm 1.797693134862315 \times 10^{308}$, including 0. Up to 15 significant figures allowed. Numbers may be as small as $\pm 2.225073858507202 \times 10^{-308}$ Integer Number Range: -32,768 through +32,767 |
| Output termination | Line feed (L _F) and end-or-identify (EOI) condition. ASCII code 10 (line feed) is sent via GPIB and the end-or-identify control line on GPIB sets to indicate the end of the transmission. |
| Units | Represent standard scientific units. Frequency Units: GZ, GHZ, MZ, MHZ, KZ, KHZ, HZ Amplitude Units: DB, DBMV, DM, DBM, DBUV, V, MV, UV, W, MW, UW Time Units: SC, S, MS, US |

Programming Command Descriptions

All supported commands are listed here, along with their descriptions and cross-references to similar commands.

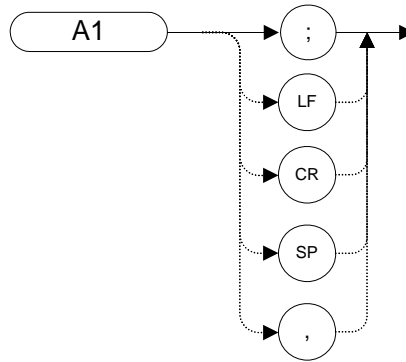
This chapter is not designed to be a comprehensive guide to all 8560 Series commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring existing 8560 Series code to your X-Series analyzer. For a fuller description of the commands, refer to the 8560 Series or Operating and Programming Manual.

In the descriptions of the commands, TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

To avoid confusion between numbers and letters, all commands that incorporate numbers have had the number spelled out and placed in square brackets after the command. For example, the command 'I1' is shown as 'I1 [*one*]' - that is, the capital letter 'I' followed by the number '1', and then the word 'one' italicized in square brackets. The italicized word in brackets does not form part of the command.

A1 [one] Clear Write for Trace A

Syntax



Description

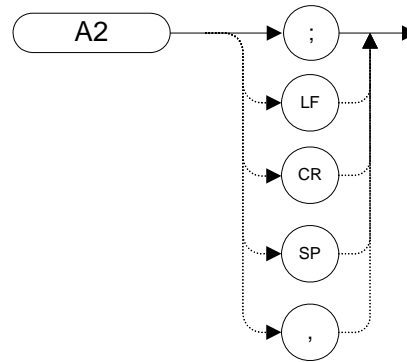
The A1 command sets Trace A to clear write which means that it continuously displays any signal present at the analyzer input. The A1 command initially clears Trace A, setting all elements to zero.

NOTE

The functions of the command A1 are identical to the CLRW TRA command ([page 96](#)).

A2 [two] Maximum Hold for Trace A

Syntax



Description

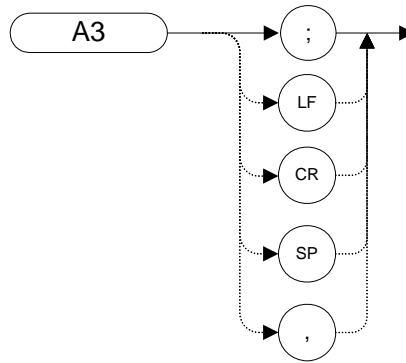
The A2 command updates each trace element with the maximum level detected during the period that the trace has been active.

NOTE

The functions of the command A2 are identical to the MXMH TRA command ([page 171](#)).

A3 [three] View Mode for Trace A

Syntax



Description

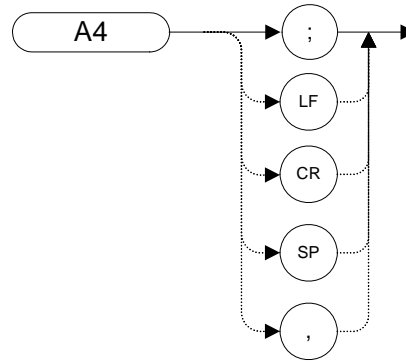
The A3 command displays Trace A and then stops the sweep if no other traces are active. Trace A does not get updated with new data.

NOTE

The functions of the command A3 are identical to the VIEW TRA command ([page 221](#)).

A4 [*four*] Blank Trace A

Syntax



Description

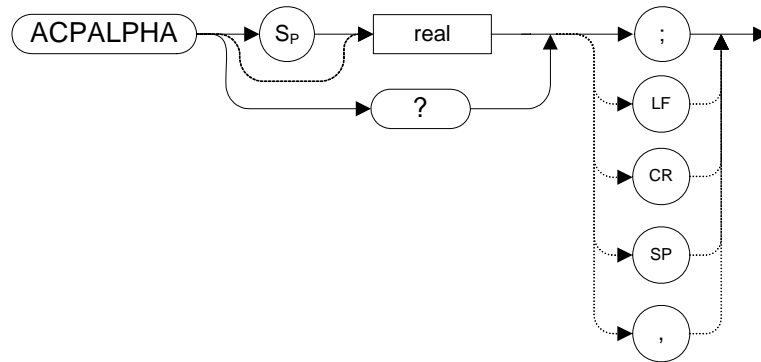
The A4 command blanks Trace A and stops the sweep if no other traces are active. Trace A is not updated.

NOTE

The functions of the command A4 are identical to the BLANK TRA command ([page 85](#)).

ACPALPHA Adjacent Channel Power Alpha Weighting

Syntax



Description

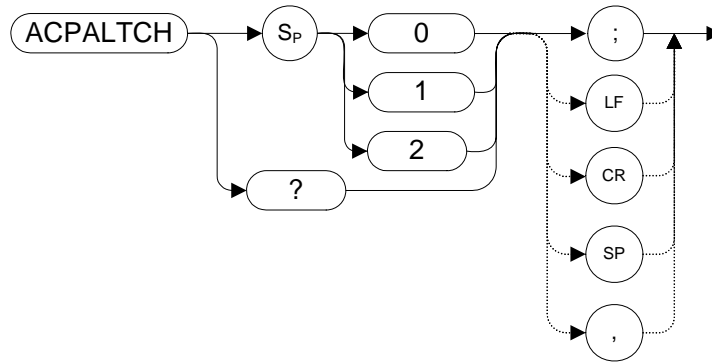
This command sets the alpha weighting for ACP measurements.

Range: Any real number between 0 and 1

ACPALTCH

Adjacent Channel Power Alternate Channels

Syntax



Description

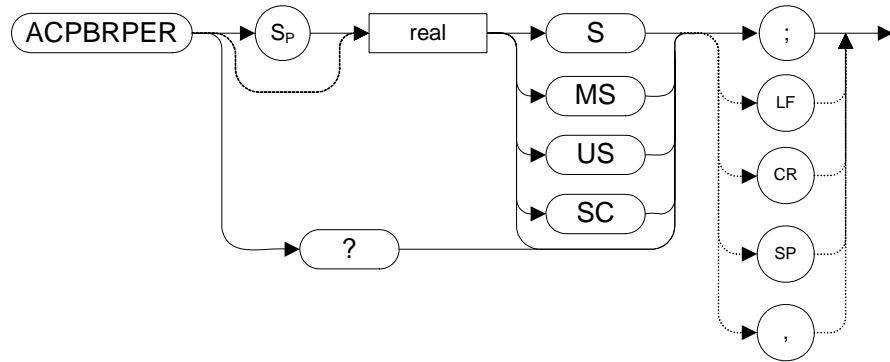
The ACPALTCH command sets the number of alternate channels to be measured by an adjacent channel power measurement to either 0, 1, or 2. The number of alternate channels is used with the ACPRSLTS command ([page 67](#)).

Range: 0, 1, or 2.

Default value: 0.

ACPBRPER Adjacent Channel Power Burst Period

Syntax



Description

The ACPBRPER command sets the cycle time (period) of the burst RF signal. The cycle time is needed to set the sweep times when using the peak, two bandwidth, burst power, and gated methods for adjacent channel power measurements.

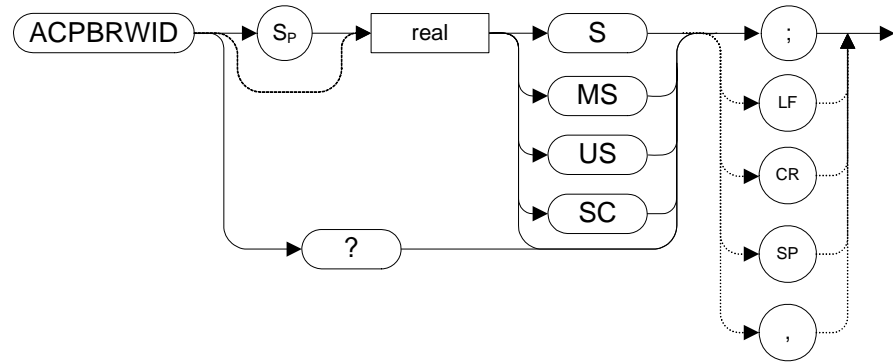
NOTE

The N9061A application supports the ACP measurement using the ANALOG method only and therefore, although the user can set ACPBRPER, it does not do anything when in RLC mode.

ACPBRWID

Adjacent Channel Power Burst Width

Syntax



Description

The ACPBRWID command sets the on-time (pulse width) of the burst RF signal. The pulse width is needed to set the gating times when using the gated method for adjacent channel power measurements.

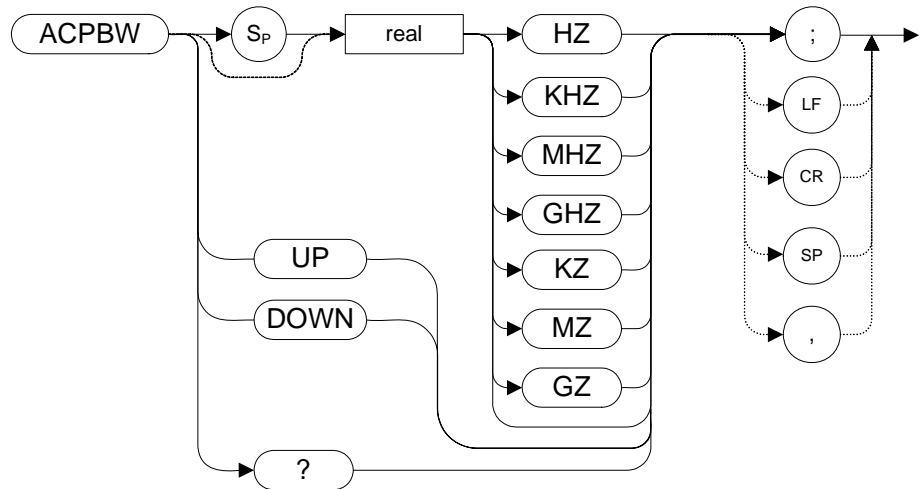
Range 5 μ s to 9.5 seconds

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only and therefore, although the user can set ACPBRWID, it does not do anything when in RLC mode.

ACPBW Adjacent Channel Power Bandwidth

Syntax



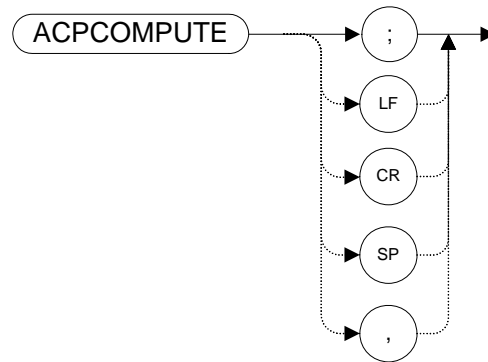
Description

The ACPBW command sets the bandwidth of the channels as an active function for the ACPMEAS (page 64) and ACPCOMPUTE (page 60) commands.

ACPCOMPUTE

Adjacent Channel Power Compute

Syntax



Description

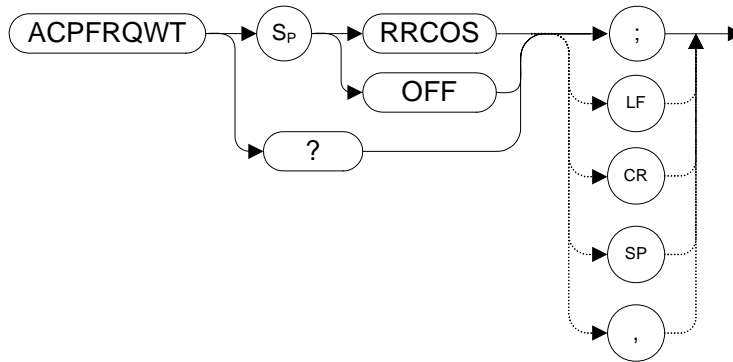
Calculates the ACP of a transmitter based on data on the display. This function does not make a new measurement before computing. The measurement must have been made with ANALOG or PEAK method selected so the appropriate data is available for the calculation.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPFRQWT Adjacent Channel Power Frequency Weighting

Syntax



Description

The ACPFRQWT command is used to control the frequency weighting when making an Adjacent Channel Power measurement. Weighting is not used in the measurement if OFF has been selected. Root-raised-cosine weighting is selected with the RRCOS parameter.

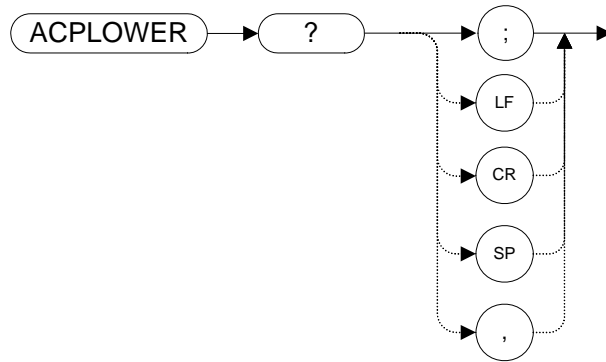
Default value: OFF

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPLOWER Lower Adjacent Channel Power

Syntax



Description

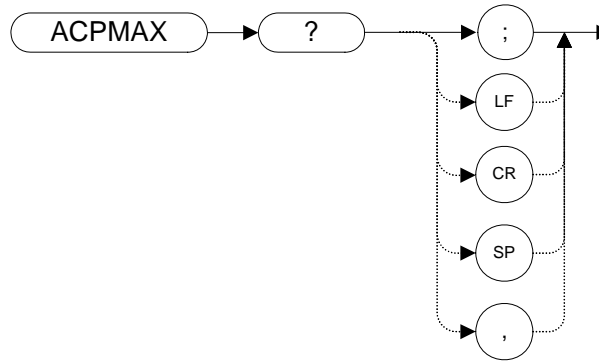
The ACPLOWER query command returns the power ratio result of the Adjacent Channel Power measurement for the lower frequency channel.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPMAX Maximum Adjacent Channel Power

Syntax



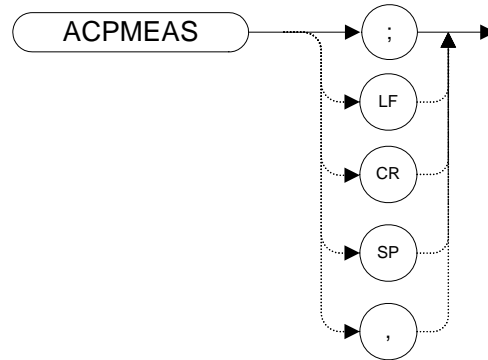
The ACPMAX query command returns the maximum adjacent channel power of the adjacent channel power measurement.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPMEAS Measure Adjacent Channel Power

Syntax



Description

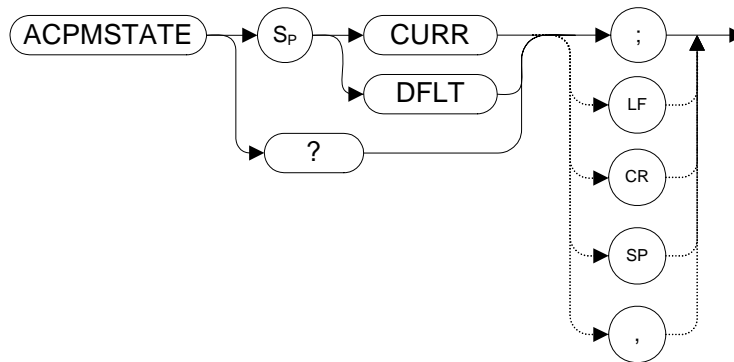
The ACPMEAS command makes a measurement and calculates the adjacent channel power (ACP) of a transmitter. The measurement determines the leakage power that is in the channels adjacent to the carrier. The result is the ratio of the leakage power in the channel adjacent to the total power transmitted by the transmitter.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPMSTATE Adjacent Channel Power Measurement State

Syntax



Description

Sets the parameters of the measurement state to either the default state (determined by the setup) or the current state. The state parameters that could change between the default state and a current state include:

- Resolution bandwidth
- Video bandwidth
- Span
- Sweep time
- Detector mode
- Gating parameters
- Trigger parameters
- Video averaging

Default value: DFLT

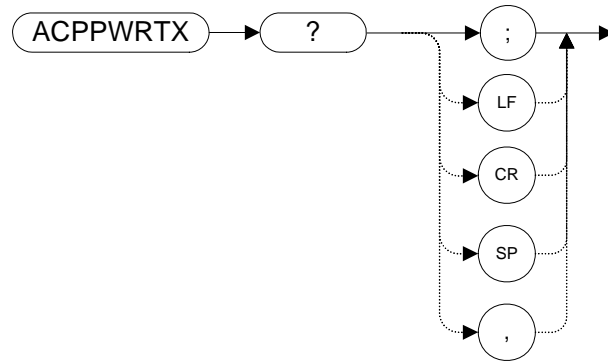
NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPPWRTX

Adjacent Channel Power Total Power Transmitted

Syntax



Description

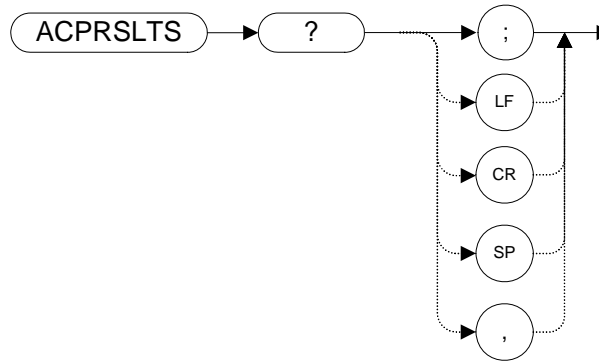
The ACPPWRTX query command returns the result of the total power transmitted calculation of the adjacent channel power measurement. The measurement must be made with the analog or burst power method selected.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPRSLTS Adjacent Channel Power Measurement Results

Syntax



Description

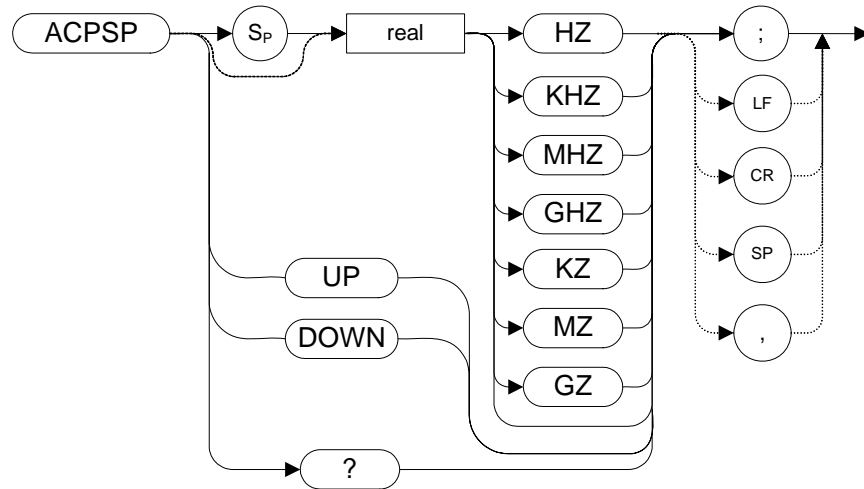
Returns an array of power data resulting from an ACP measurement of an RF signal. The number of alternate channel pairs selected by the ACPALTCH ([page 56](#)) command determines the size of the array.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPSP Adjacent Channel Power Channel Spacing

Syntax



Description

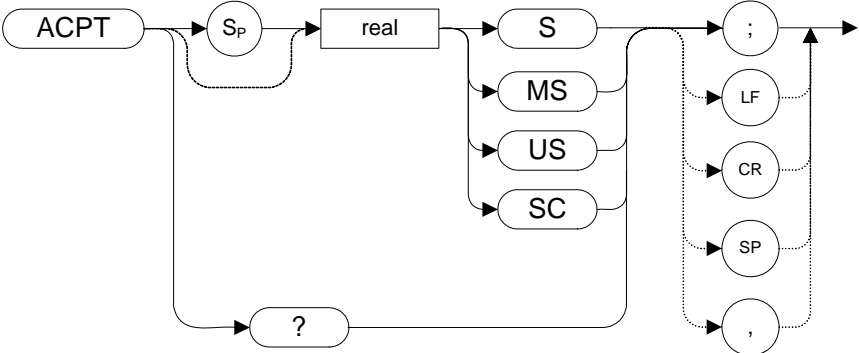
Sets the channel spacing for the ACPMEAS ([page 64](#)) and ACPCOMPUTE ([page 60](#)) commands.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPT Adjacent Channel Power T Weighting

Syntax



Description

The ACPT command is used to set the T used in weighting for an adjacent channel power measurement.

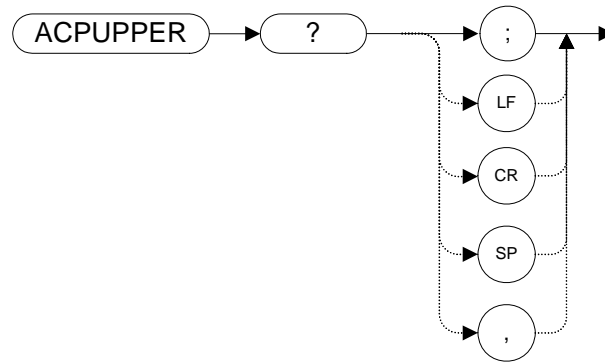
NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ACPUPPER

Upper Adjacent Channel Power

Syntax



Description

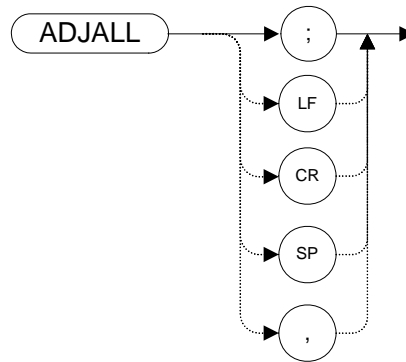
The ACPUPPER query command returns the power ratio result of the adjacent channel power measurement for the upper frequency channel.

NOTE

The N9061A application supports the ACP measurement using the ANALOG method only.

ADJALL LO and IF Adjustments

Syntax



Description

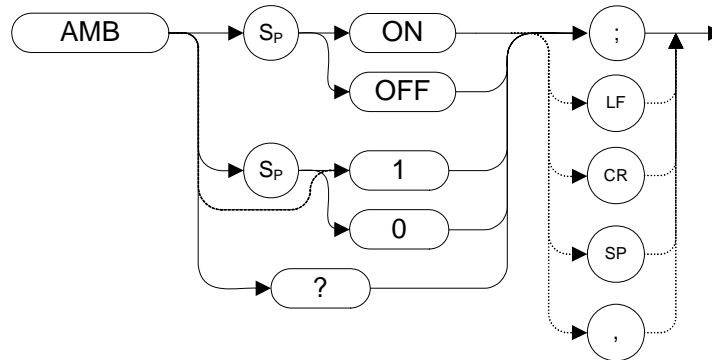
The ADJALL command activates the RF local oscillator (LO) and intermediate frequency (IF) alignment routines. These are the same routines that occur when the analyzer is switched on. They are also the same routines that are performed when you press **System, Alignments, Align Now, All**.

Commands following ADJALL are not executed until after the analyzer has finished the alignment routines.

AMB

A minus B into A

Syntax



Description

The AMB command subtracts the points in Trace B from the corresponding points in Trace A, and sends the results to Trace A. Thus, AMB can restore the original trace after an APB (page 75) command has been executed.

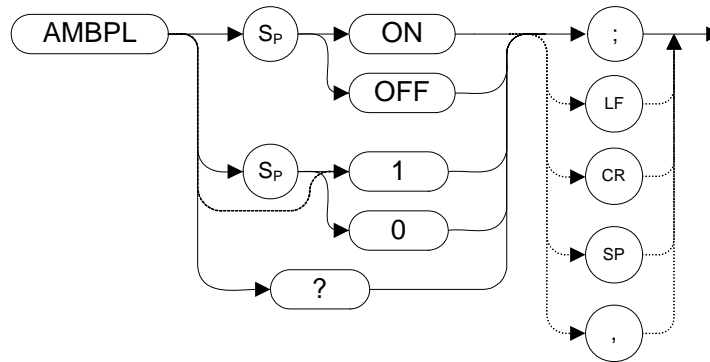
The query command AMB? returns different responses depending on the language being used. The 8560 Series languages return either a **1** or a **0** to indicate the On or Off status.

NOTE

The functions of the command AMB are identical to the C2 [two] command (page 88).

AMBPL (A minus B) plus Display Line into A

Syntax



Description

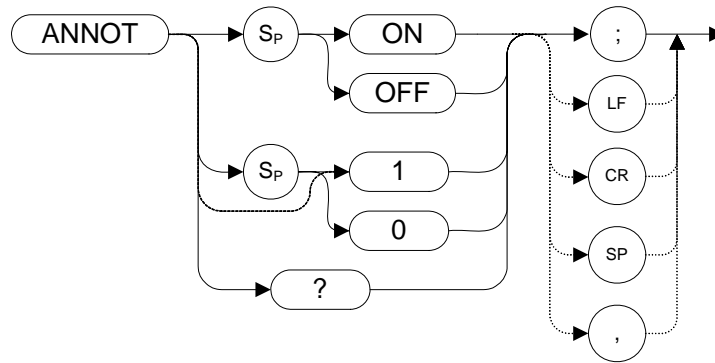
The AMBPL command does a point-by-point subtraction of Trace B from Trace A, and then adds the display line point values to the difference. The results are sent to Trace A.

The query command AMBPL? returns different responses depending on the language being used.

Query response is either 1 or 0, indicating ON or OFF state.

ANNOT Annotation

Syntax



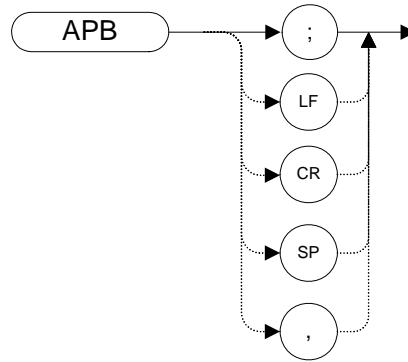
Preset State: ANNOT ON

Description

The ANNOT command turns on or off all annotation on the analyzer display. Softkey labels are not affected by this command and remain displayed.

APB Trace A Plus Trace B to A

Syntax



Description

The APB command does a point-by-point addition of Trace A and Trace B, and sends the results to Trace A. Thus, APB can restore the original trace after an AMB (page 72) or a C2 (page 88) command has been executed.

AT Input Attenuation

Syntax

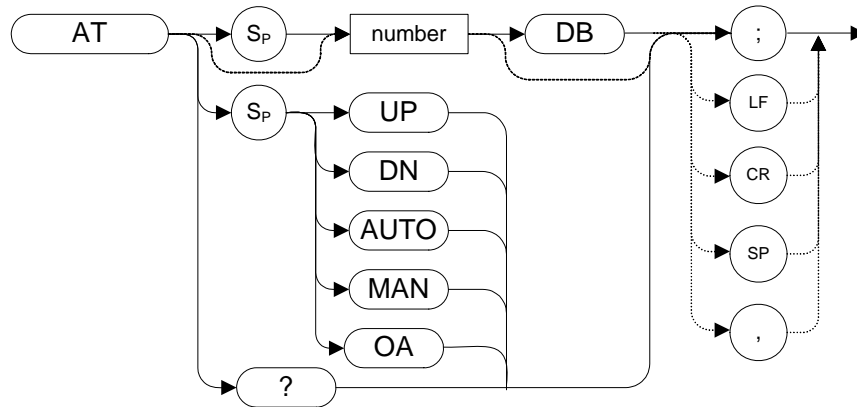


Table 4-2

| Item | Description/Default | Range |
|--------|---|--|
| Number | Any real number or integer. If the value you enter is not a valid value for the analyzer you are using, it switches automatically to the closest valid setting. Default units are dB. | 0 to 70 dB specified absolutely and 10 to 70 dB in 10 dB steps ^a |

a. The range is limited to 0 to 60 dB if 8564E/EC or 8565E/EC is selected.

Preset State: 10 dB

Step Increment: 10 dB

Description

Specifies the RF input attenuation.

Although the attenuation level in the X-series of analyzers can be specified using absolute values, you can never set attenuation below 10 dB using the DOWN steps. This is a safety feature to prevent inadvertent setting of attenuation to a level that could damage the analyzer.

CAUTION

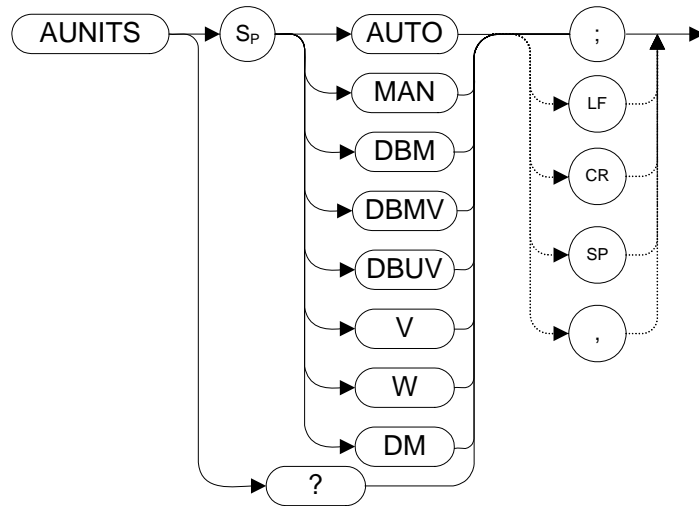
Signal levels above +30 dBm will damage the signal analyzer.

NOTE

You cannot step down below 10 dB. To set levels below 10 dB, you must specify the attenuation absolutely. For example, to set attenuation to 0 dB, you must use the command **AT 0DB**.

AUNITS Absolute Amplitude Units

Syntax



Description

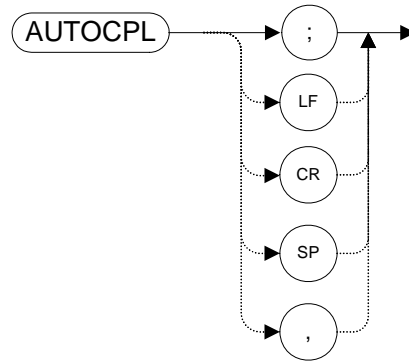
Specifies the amplitude readout units for the reference level, the marker, and the display line.

NOTE

If the AUNITS setting is AUTO, then a change from log scale (LG) to linear scale (LN) automatically changes the AUNITS setting. For all other settings, no change to AUNITS occurs, even when the scale is changed.

AUTOPL Auto Coupled

Syntax

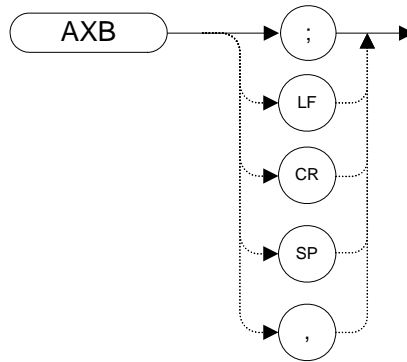


Description

Sets video bandwidth, resolution bandwidth, input attenuation, sweep time and center frequency step-size to coupled mode.

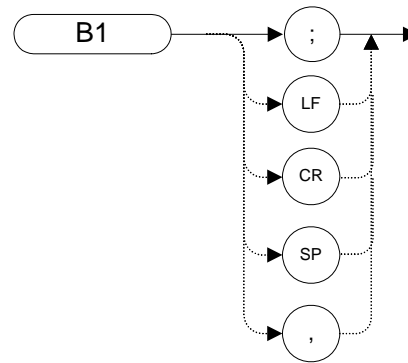
AXB Exchange Trace A and Trace B

Syntax



Description

This command exchanges Trace A and Trace B, point by point.

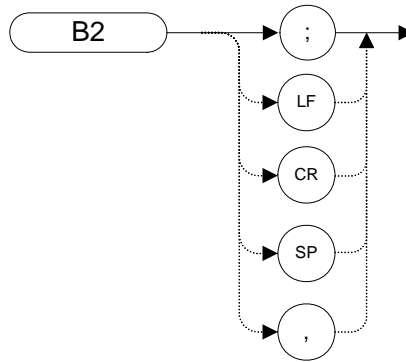
B1 [one]
Clear Write for Trace B**Syntax****Description**

The B1 command sets Trace B to clear write. That is, it continuously displays any signal present at the analyzer input. The B1 command initially clears Trace B, setting all elements to zero. The sweep trigger then signals the start of the sweep, and Trace B is continually updated as the sweep progresses. Subsequent sweeps send new amplitude information to the display addresses.

The functions of the command B1 are identical to the CLRW TRB command ([page 96](#)).

B2 [two] Maximum Hold for Trace B

Syntax



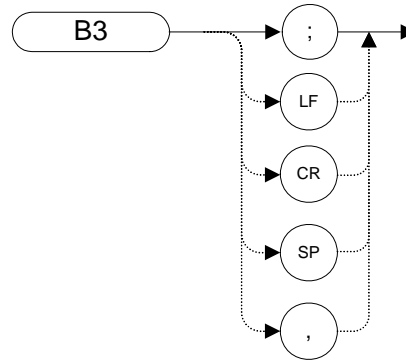
Description

The B2 command updates each trace element with the maximum level detected while the trace is active.

The functions of the command B2 are identical to the MXMH TRB command ([page 171](#)).

B3 [*three*] View Mode for Trace B

Syntax



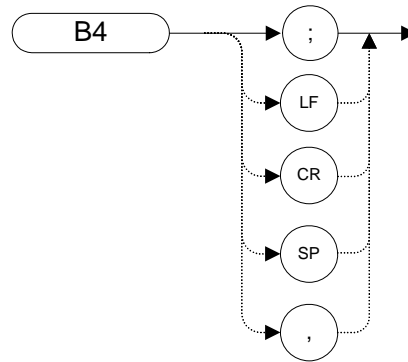
Description

The B3 command displays Trace B and then stops the sweep if no other traces are active. Trace B does not get updated.

The functions of the command B3 are identical to the VIEW TRB command ([page 221](#)).

B4 [four] Blank Trace B

Syntax



Description

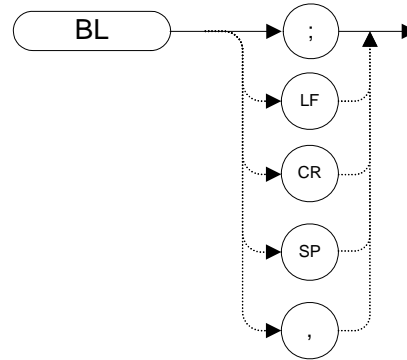
The B4 command blanks Trace B and stops the sweep if no other traces are active. Trace B is not updated.

The functions of the command B4 are identical to the BLANK TRB command ([page 85](#)).

BL

Trace B minus Display Line to Trace B

Syntax



Description

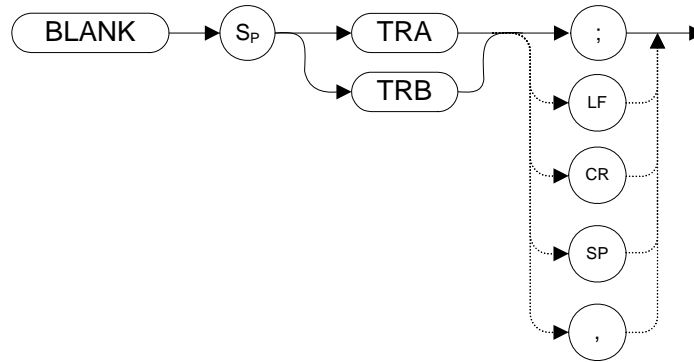
The BL command subtracts the display line from Trace B and sends the results to Trace B.

The command BL is calculated in units of dBm.

The functions of the command BL are identical to the BML command ([page 86](#)).

BLANK Blank Trace

Syntax



Preset State: BLANK TRB

Description

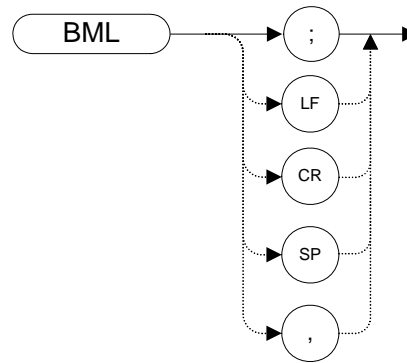
Blanks Trace 1 or trace 2 and stops taking new data into the specified trace. TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

The functions of the command BLANK are identical to the A4 command (page 54) and the B4 command (page 83).

For information on the trace settings of the X-series analyzers when legacy instrument trace settings are sent, see [Table 4-4, “8560 series command mapping to X-series for trace/detector settings.”](#)

BML Trace B Minus Display Line

Syntax



Description

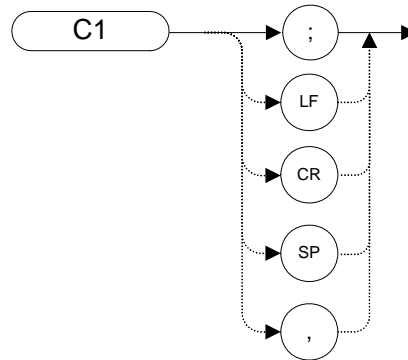
The BML command subtracts the display line from trace B (point by point), and sends the difference to trace B. Trace B corresponds to Trace 2.

The command BML uses units of dBm.

The functions of the command BML are identical to the BL command ([page 84](#)).

C1 [one] Set A Minus B Mode Off

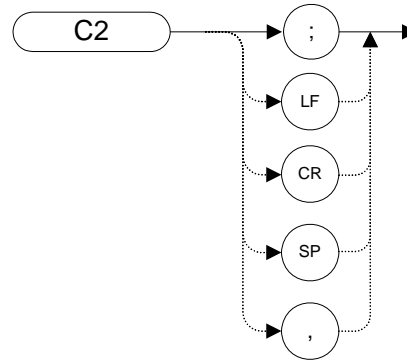
Syntax



Description

The C1 command turns the A Minus B mode off. That is, it switches off the functionality that was switched on by the C2 command ([page 88](#)) or by the AMB ON command ([page 72](#)).

The functions of the command C1 are identical to the AMB OFF command ([page 72](#)).

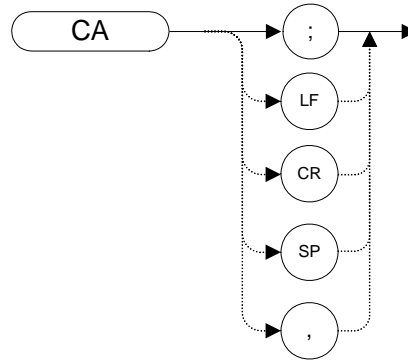
**C2 [two]
A Minus B Into A****Syntax****Description**

The C2 command subtracts the points in Trace B from the corresponding points in Trace A, and sends the results to Trace A. Thus, if your input signal remains unchanged, C2 can restore the original trace after an APB command ([page 75](#)) has been executed.

The functions of the command C2 are identical to the AMB ON command ([page 72](#)).

CA Couple Attenuation

Syntax



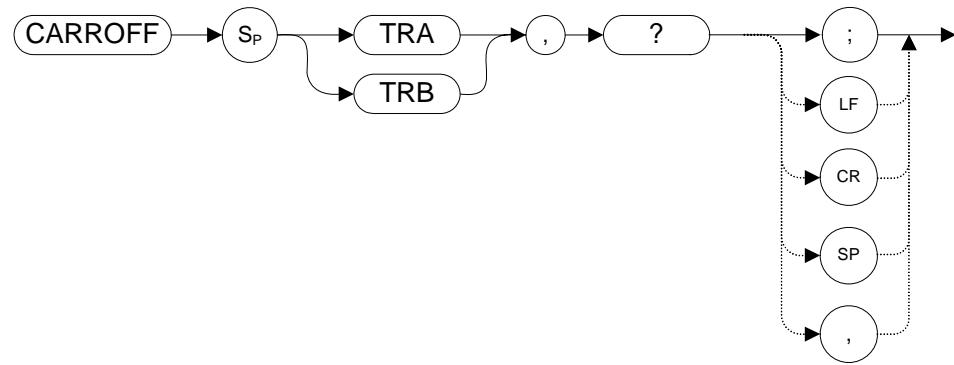
Description

During normal operation, the analyzer's input attenuation is coupled to the reference level. This coupling keeps the mixer input at a level such that a continuous wave signal displayed at the reference level is at or below -10 dBm (or the value specified in the ML command.)

The CA command sets the threshold to -10 dBm (or to the value specified by the ML command [\(page 168\)](#)). The counterpart to the CA command is the AT command [\(page 76\)](#), which allows levels less than the threshold value at the mixer input.

CARROFF Carrier Off Power

Syntax



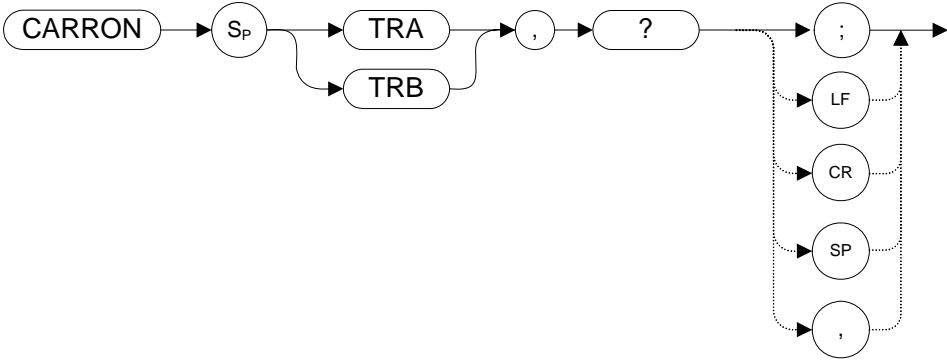
Description

Measures the average and peak power of the carrier during the portion of time when the power is off (when it is not within 20 dB of its peak level). The powers are combined to provide a calculation of the leakage power.

The measurement needs to be in zero span for the measurement to run.

CARRON Carrier On Power

Syntax



Description

Measures the average power of the carrier during the portion of time when it is on and within 20 dB of its peak level.

The measurement needs to be in zero span for the measurement to run.

CF Center Frequency

Syntax

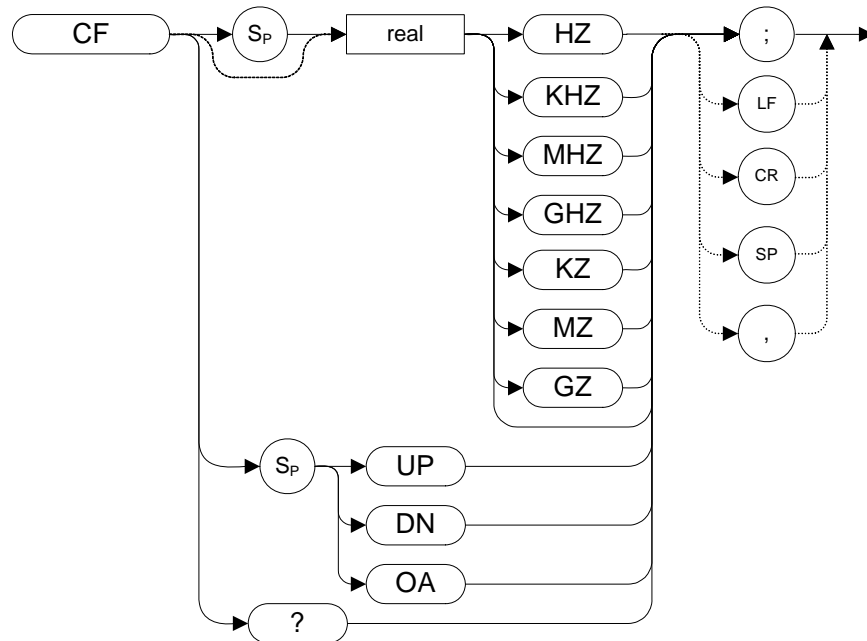


Table 4-3

| Item | Description/Default | Range |
|------|--|---------------------------------|
| REAL | Any real or integer number. Default unit is HZ. | Frequency range of the analyzer |

Description

The CF command specifies the value of the center frequency.

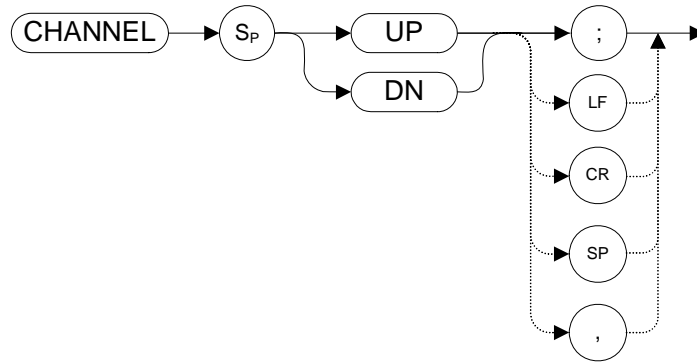
The step size depends on whether the frequency has been coupled to the span width using the CS command (page 101). When coupled, the step size is 10% of the span, or one major graticule division; when uncoupled, the step size is determined by the SS command (page 197).

NOTE

Although the analyzer allows entry of frequencies not in the specified frequency range, using frequencies outside the frequency span of the analyzer is not recommended and is not warranted to meet specifications.

CHANNEL Channel Selection

Syntax



Description

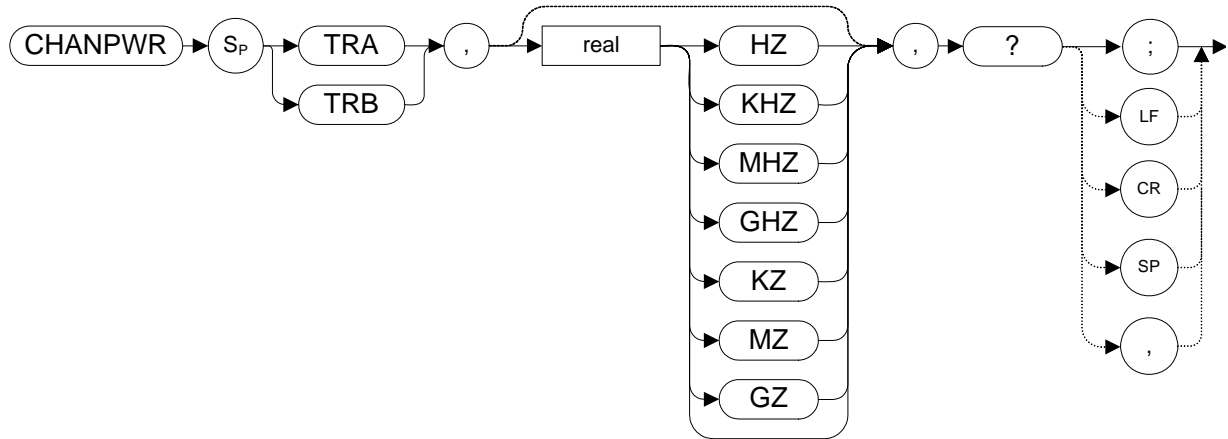
Increments or decrements the analyzer center frequency by one channel spacing.

NOTE

The channel spacing value is set using the ACPSP command ([page 68](#)).

CHANPWR Channel Power

Syntax



Description

Measures the power within the specified channel bandwidth.

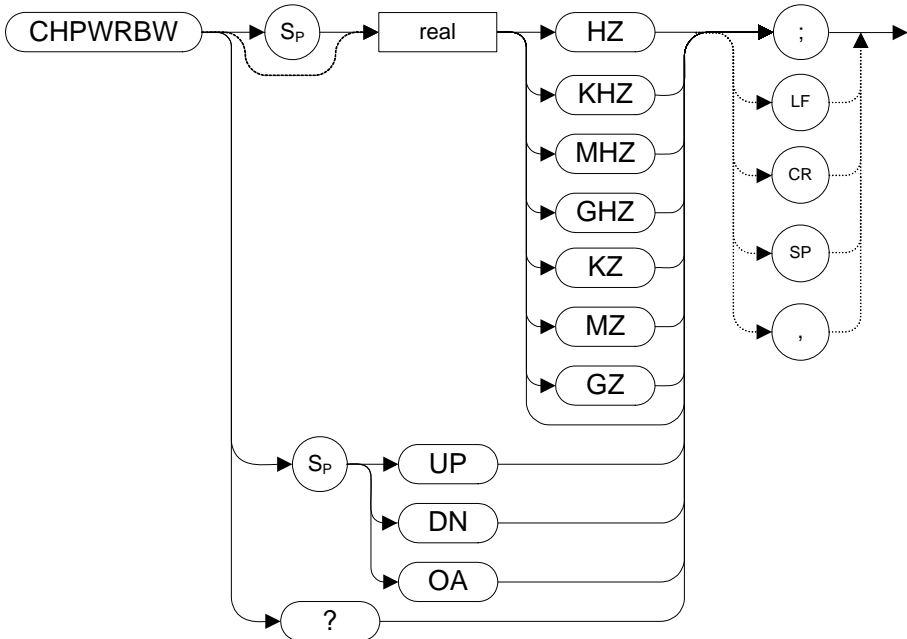
NOTE

If no channel bandwidth is specified in the command, the channel bandwidth is set using the CHPWRBR command ([page 95](#)).

CHPWRBW

Channel Power Bandwidth

Syntax



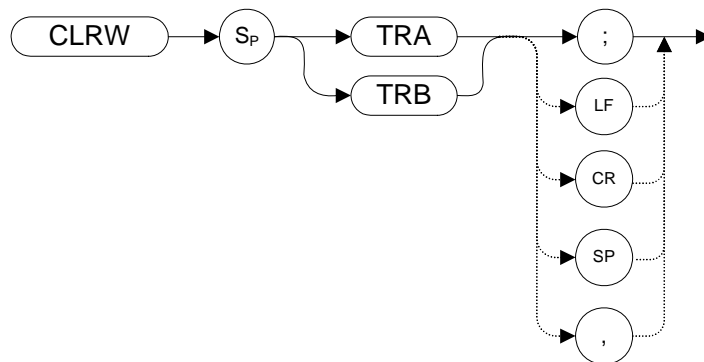
Description

Queries or sets the current value of the channel power bandwidth. Channel power can be measured with the CHANPWR command (page 94).

CLRW Clear Write

Clears the specified trace and enables trace data acquisition.

Syntax



Preset State: CLRW TRA

Description

The CLRW command places the indicated trace in clear-write mode. Data acquisition begins at the next sweep. (See the TS command ([page 217](#)) for more information about data acquisition.)

TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

NOTE

The functions of the command CLRW are identical to the A1 command ([page 51](#)) and B1 command ([page 80](#)).

On the 8560 series of analyzers the trace settings are set by the trace mode parameters, CLRW, VIEW, BLANK, MINH and MAXH and the averaging settings by VAVG. On the X-series the same settings are set in the Trace/Detector and View/Blank parameters. The following table describes what the N9061A application sets in the X-series box when the legacy commands for trace mode and averaging are sent.

Table 4-4 8560 series command mapping to X-series for trace/detector settings

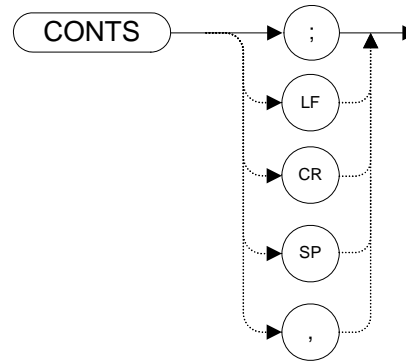
| 8560 series | | | X-series | | |
|----------------|------------------|----------------|---------------------------|------------|-----------|
| Trace commands | Averaging (VAVG) | Detector (DET) | Trace/Detector Trace Type | View/Blank | Detector |
| CLWR | Off | Normal | ClearWrite | On | Last set |
| CLWR | On | Sample | Trace Average | On | Sample |
| MXMH | Off | Peak | Max Hold | On | Peak |
| MXMH | On | Sample | Trace Average | On | Peak |
| MINH | Off | NegPeak | Min Hold | On | NegPeak |
| MINH | On | Sample | Trace Average | On | NegPeak |
| VIEW | Off | Normal | No change | View | No change |
| VIEW | On | Sample | Trace Average | View | Sample |
| BLANK | Off | Normal | No change | Blank | No change |
| BLANK | On | Sample | Trace Average | Blank | Sample |

For example if the 8560 series sends CLRW and the averaging is set to ON, the 8560 series analyzer detector is automatically set to Sample. The N9061A application sets the X-series instrument trace type to Trace Average, View/Blank to On and the Detector to Sample.

CONTS

Continuous Sweep

Syntax



Preset State: CONTS

Description

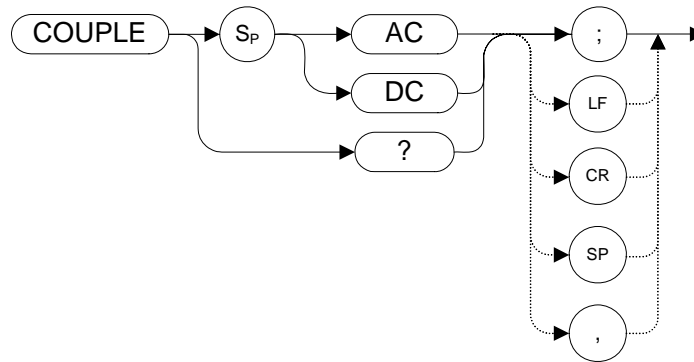
The CONTS command sets the analyzer to continuous sweep mode. In the continuous sweep mode, the analyzer takes its next sweep as soon as possible after the current sweep (as long as the trigger conditions are met). A sweep may temporarily be interrupted by data entries made over the remote interface or from the front panel.

NOTE

The functions of the command CONTS are identical to the S1 command ([page 188](#)).

COUPLE Input Coupling

Syntax



Description

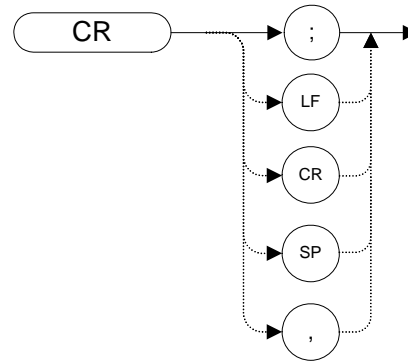
The COUPLE command selects AC or DC coupling.

NOTE

When using the X-series analyzers, you must use DC coupling to see calibrated frequencies of less than 20 MHz. Signals of less than 20 MHz are not calibrated when using AC coupling on these analyzers.

CR Couple Resolution Bandwidth

Syntax



Description

The CR command couples the resolution bandwidth to the span.

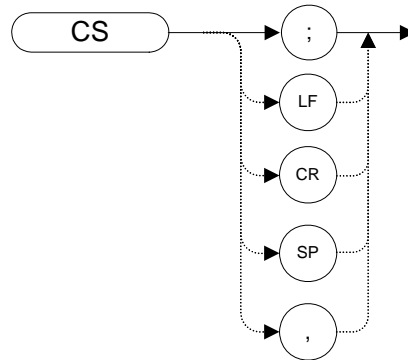
The counterpart to the CR command is the RB command ([page 180](#)) which breaks the coupling. Use the CR command to re-establish coupling after executing an RB command.

NOTE

CR uses the legacy instrument settings for resolution bandwidth only if **Mode Setup > Preferences > Limit RBW/VBW** is set to **ON**.

CS Couple Frequency Step Size

Syntax



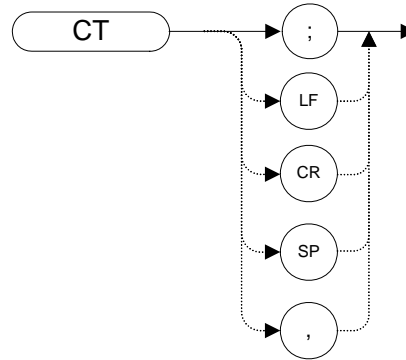
Description

The CS command couples the center frequency step size to the span width so that the step size equals 10% of the span width, or one major graticule division.

The counterpart to the CS command is the SS command ([page 197](#)) which breaks the coupling. Use the CS command to re-establish coupling after an SS command has been executed.

CT Couple Sweep Time

Syntax



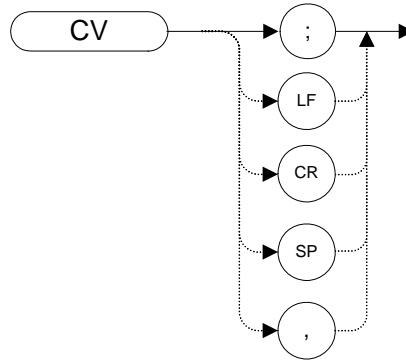
Description

The CT command couples the sweep time to the span, resolution bandwidth and video bandwidth.

The counterpart to the CT command is the ST command ([page 198](#)) which breaks the coupling. Use the CT command to re-establish coupling after an ST command has been executed.

CV Couple Video Bandwidth

Syntax



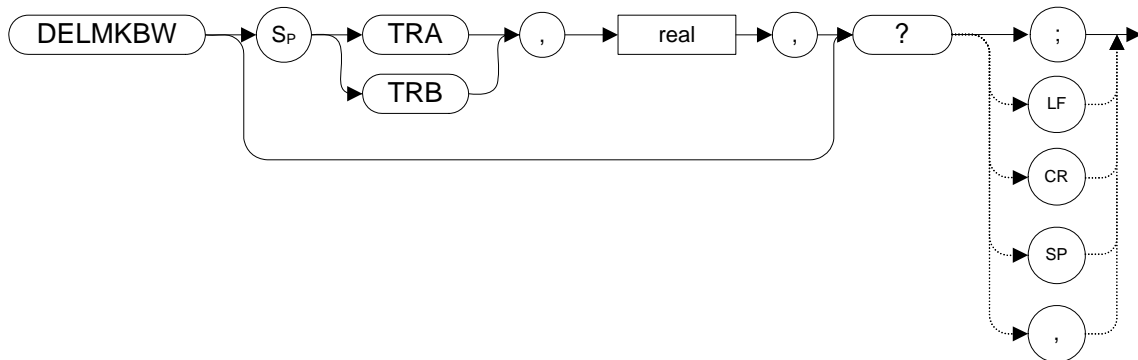
Description

The CV command couples the video bandwidth to the resolution bandwidth.

The counterpart to the CV command is the VB command ([page 219](#)) which breaks the coupling. Use the CV command to re-establish coupling after executing a VB command.

NOTE

CV uses the legacy signal analyzer settings for video bandwidth only if **Mode Setup > Preferences > Limit RBW/VBW** is set to **ON**.

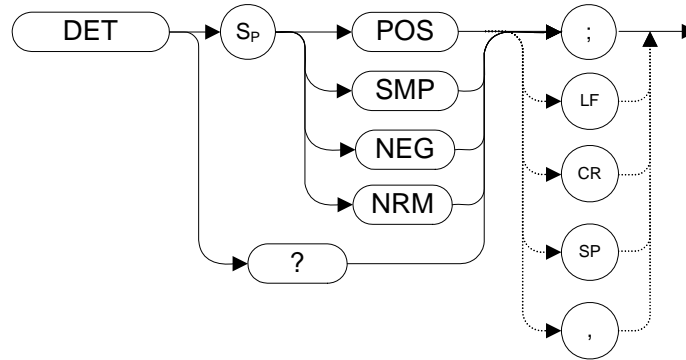
DELMKBW**Occupied Power Bandwidth Within Delta Marker****Syntax****Description**

Calculates the OBW with respect to the power between the displayed delta markers. The power between the displayed markers is then used as the reference, rather than using the total power in the frequency span as is done in the PWRBW (page 179) command.

If the DELMKBW command is used when no marker is active, a delta marker is activated at the center frequency, and the returned bandwidth is 0. If the active marker is a normal marker when the DELMKBW command is used, the marker type is changed to delta, and the returned bandwidth is 0.

DET Detection Mode

Syntax



Preset State: DET NRM

Description

The DET command selects the type of analyzer detection (positive-peak, negative peak, sample, normal, and so on).

- POS** enables positive-peak detection, which displays the maximum video signal detected over a number of instantaneous samples for a particular frequency.
- SMP** enables sample detection, which uses the instantaneous video signal value. Video averaging and noise-level markers, when activated, activate sample detection automatically.
- NEG** enables negative peak detection.
- NRM** enables the '*rosenfell*' detection algorithm that selectively chooses between positive and negative values.

DL Display Line

Syntax

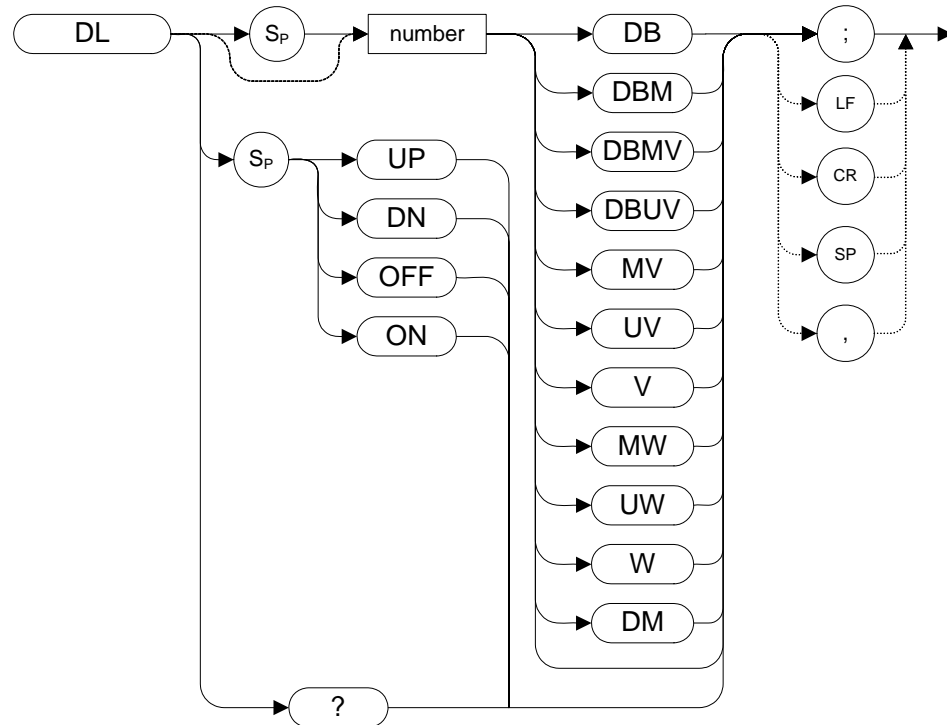


Table 4-5

| Item | Description/Default | Range |
|--------|---|----------------------------------|
| NUMBER | Any real or integer number. Default units are dBm. | Dependent on the reference level |

Preset State: DL OFF

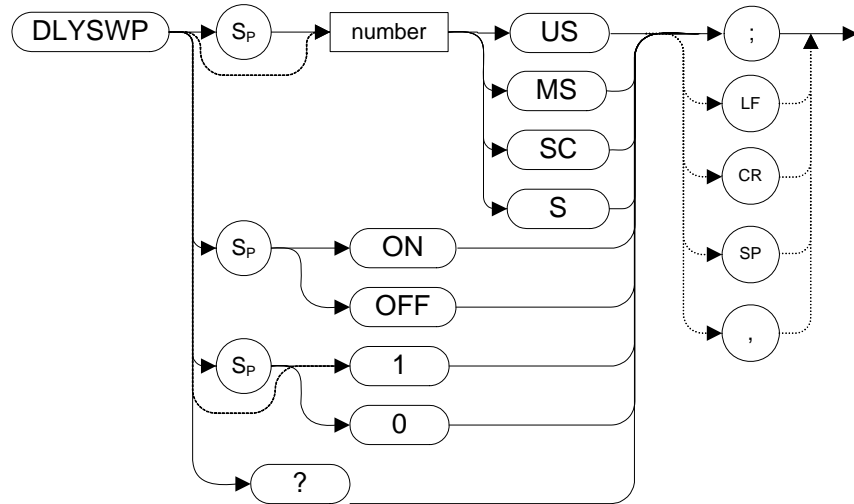
Step Increment: 1 major graticule division

Description

Defines the level of the display line and displays it on the analyzer screen.

DLYSWP Delay Sweep

Syntax



Description

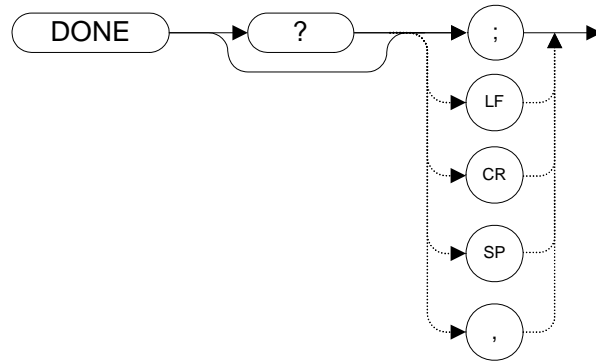
Delays the start of the sweep until the specified time after the trigger event has elapsed.

NOTE A query response of 0 indicates that DLYSWP is switched off.

DONE

Done

Syntax



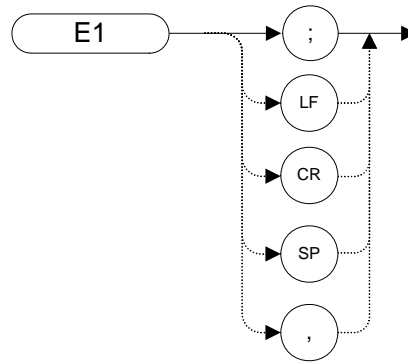
Description

Allows you to determine when the analyzer has parsed a list of analyzer commands and has executed all commands prior to and including DONE. The DONE command returns a value of “1” when all commands in a command string or command list have been completed.

If a take sweep (TS command ([page 217](#))) precedes the command list, the TS command acts as a synchronizing function since the command list execution begins after the sweep has been completed.

E1[one] Peak Marker

Syntax



Description

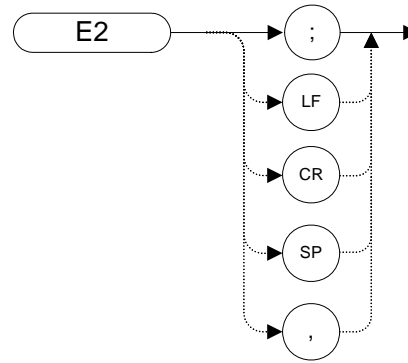
The E1 command positions the marker at the signal peak.

NOTE

The functions of the E1 command are identical to MKPK (no secondary keyword) and MKPK HI ([page 160](#)).

E2 [two] Marker to Center Frequency

Syntax



Description

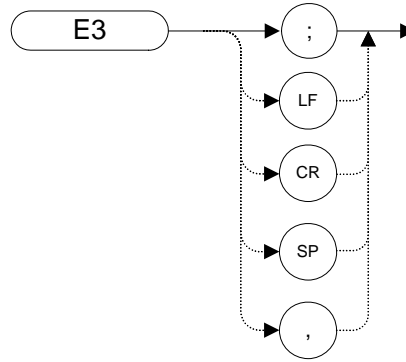
The E2 command positions the marker on the screen at the center frequency position.

NOTE

The functions of the E2 command are identical to the MKCF command ([page 150](#)).

E3 [three] Delta Marker Step Size

Syntax



Description

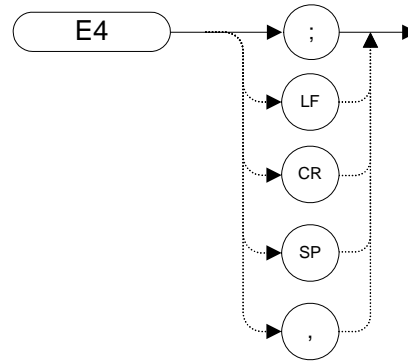
The E3 command establishes the center frequency step size as being the frequency difference between the delta marker and the active marker.

NOTE

The functions of the E3 command are identical to the MKSS command ([page 165](#)).

E4 [four] Marker to Reference Level

Syntax



Description

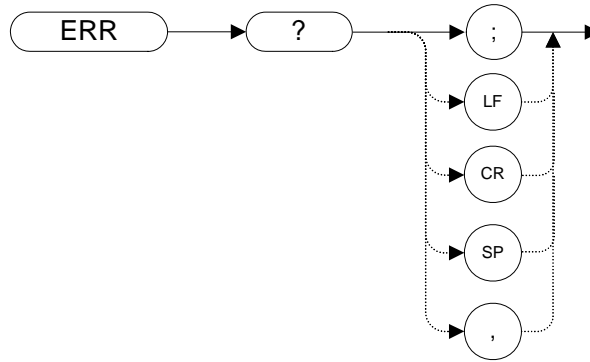
The E4 command moves the active marker to the reference level.

NOTE

The functions of the E4 command are identical to the MKRL command ([page 163](#)).

ERR Error

Syntax



Description

The ERR command returns a list of three-digit error codes if errors are present. A code of “0” means that there are no errors present. Executing ERR? clears all GPIB errors.

If a command is a valid legacy command but not accepted by the N9061A application, no error message is generated and the response to ERR? is 0. However, if logging is enabled, the N9061A application command log registers a “Cmd not Supported” error.

If a command is not a valid legacy command, a command error is generated; CMD ERR is displayed on the front panel and the response to ERR? is 112. If logging is enabled then Cmd Error is written to the command error log.

Table 4-6

| Error Code | Description |
|------------|-------------|
| 112 | CMD ERR |

Error codes are provided in RLC mode for some X-series errors such as external reference, hardware and alignment errors. The X-series error codes are translated to 8560 series error codes so that an error query returns the legacy instrument error code. To review the error via the front panel, select the **System** hardkey and then select **Show > Errors**. The following table shows the X-series error codes and the translated value.

Programming Commands

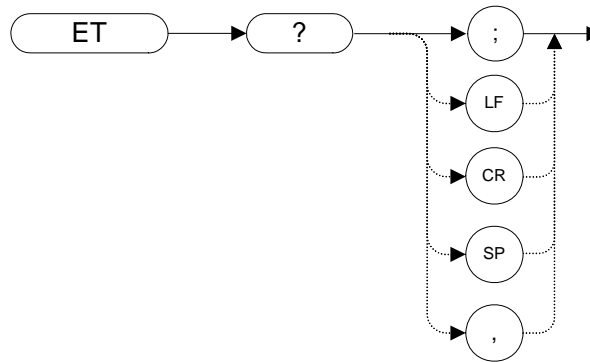
ERR Error

Table 4-7

| X-series error code | Description | 8560 series error code | Description |
|---------------------|---|------------------------|---|
| 40 | TG Alignment Failure | 758 | SYSTEM: Unknown system error |
| 42 | RF Alignment Failure | 758 | SYSTEM: Unknown system error |
| 44 | IF Alignment Failure | 758 | SYSTEM: Unknown system error |
| 46 | LO Alignment Failure | 758 | SYSTEM: Unknown system error |
| 48 | ADC Alignment Failure | 758 | SYSTEM: Unknown system error |
| 50 | FM Demod Alignment Failure | 758 | SYSTEM: Unknown system error |
| 54 | Extended Align Failure Sum | 758 | SYSTEM: Unknown system error |
| 71 | Characterize Preselector Failure | 758 | SYSTEM: Unknown system error |
| -200.3310 | Execution Error; Preselector Centering failed | 758 | SYSTEM: Unknown system error |
| 503 | Frequency Reference Unlocked | 336 | 10 MHz Ref Cal oscillator failed to lock when going to internal 10 MHz reference. |
| 505 | 2nd LO Unlocked | 336 | 10 MHz Ref Cal oscillator failed to lock when going to internal 10 MHz reference. |
| 509 | LO Unlocked | 300 | YTO UNL: YTO (1st LO) phase-locked loop (PLL) is unlocked. |
| 513 | IF Synthesizer Unlocked | 450 | IF SYSTEM: IF hardware failure. Check other error messages. |
| 515 | Calibration Oscillator Unlocked | 336 | 10 MHz Ref: Cal oscillator failed to lock when going to internal 10 MHz reference |
| 521 | External Ref missing or out of range | 905,333 | EXT REF: Unable to lock cal oscillator when set to external reference. Check that the external reference is within tolerance. 600 UNLK: 600 MHz reference oscillator PLL is unlocked |

ET Elapsed Time

Syntax

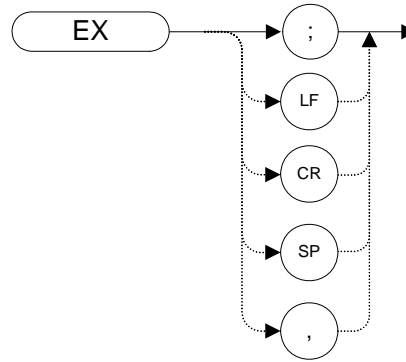


Description

The ET command returns to the controller the elapsed time (in hours) of analyzer operation.

EX Exchange Trace A and Trace B

Syntax



Description

This command exchanges Trace A and Trace B, point by point.

NOTE

The functions of the EX command are identical to the AXB command ([page 79](#)).

FA Start Frequency

Syntax

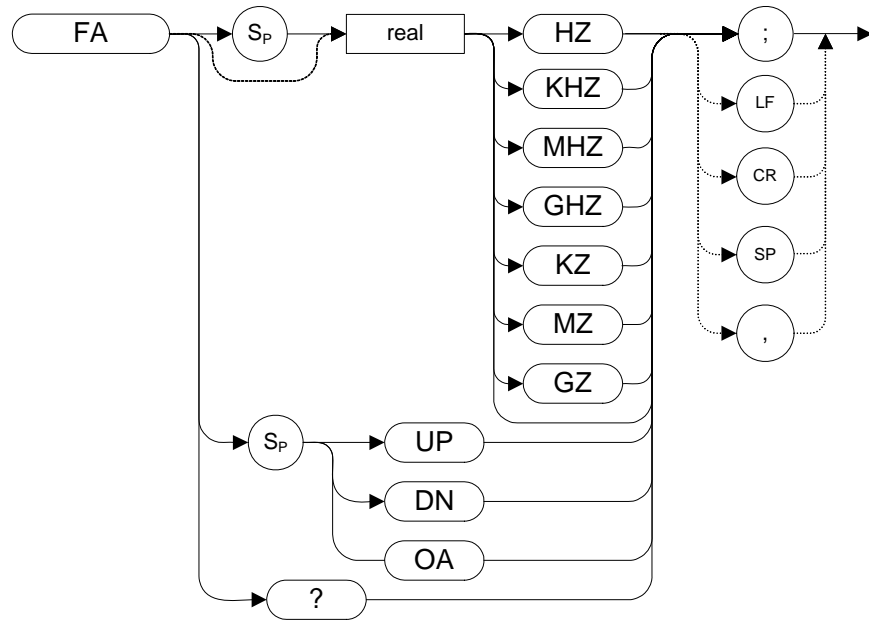


Table 4-8

| Item | Description/Default | Range |
|------|--|---------------------------------|
| REAL | Any real or integer number. Default unit is Hz. | Frequency range of the analyzer |

Step Increment: Frequency span divided by 10

Description

The FA command specifies the start frequency value. The start frequency is equal to the center frequency minus (the span divided by two) ($FA = CF - SP/2$). Changing the start frequency changes the center frequency and span.

NOTE

The OA parameter only returns the current value to the controller. It does not set the active function to the start frequency.

FB Stop Frequency

Syntax

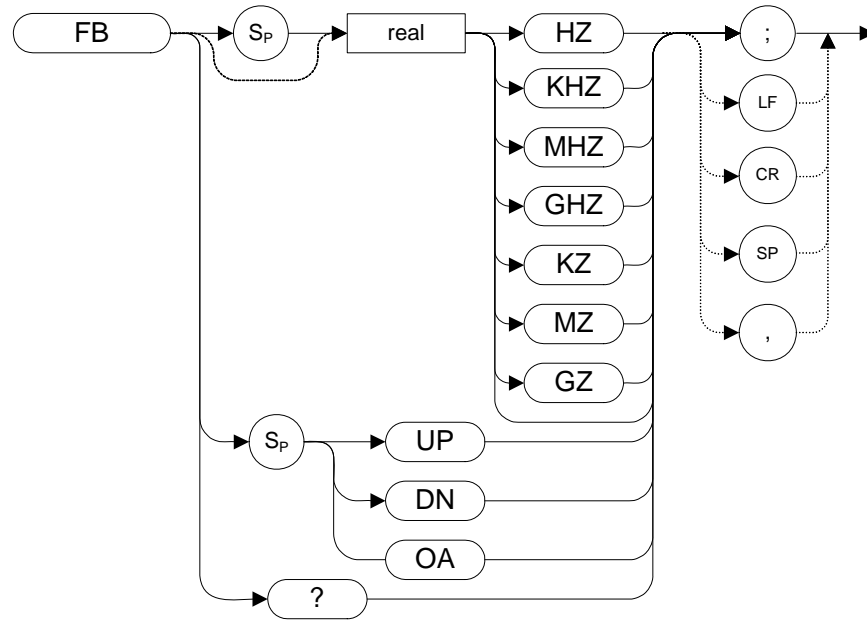


Table 4-9

| Item | Description/Default | Range |
|------|--|---------------------------------|
| REAL | Any real or integer number. Default unit is Hz. | Frequency range of the analyzer |

Step Increment: Frequency span divided by 10

Description

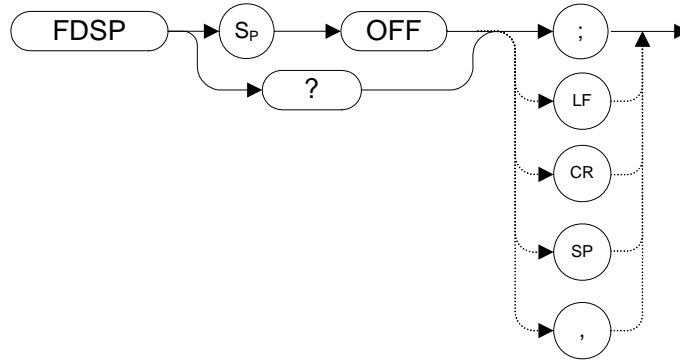
The FB command specifies the stop frequency value. The stop frequency is equal to the center frequency plus the span divided by two ($FB = CF + SP/2$). Changing the stop frequency changes the center frequency and span.

NOTE

The OA parameter only returns the current value to the controller. It does not set the active function to the stop frequency.

FDSP Frequency Display Off

Syntax



Description

The FDSP command turns the frequency annotation OFF.

NOTE

It is not possible enable or disable the frequency annotation alone, leaving other annotation unaffected. Thus, the FDSP command behaves in the same way as ANNOT (page 74) If the FDSP command has been used to disable the frequency annotation, sending the ANNOT ON command does not re-enable the display annotation. The display annotation is only displayed by sending the IP (page 134) command.

FOFFSET Frequency Offset

Syntax

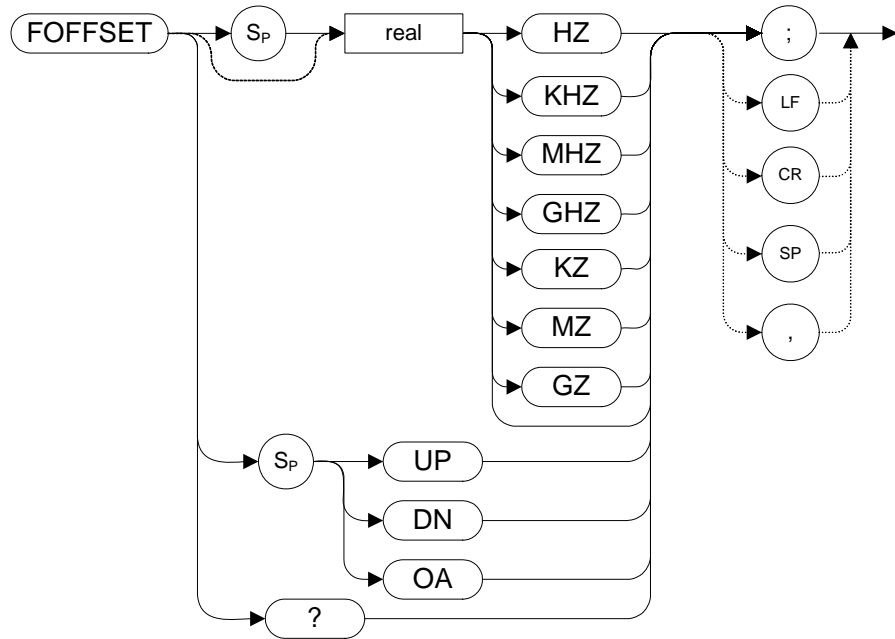


Table 4-10

| Item | Description/Default | Range |
|------|--|-------|
| REAL | Any real or integer number. Default unit is Hz. | |

Preset State: 0 Hz

Description

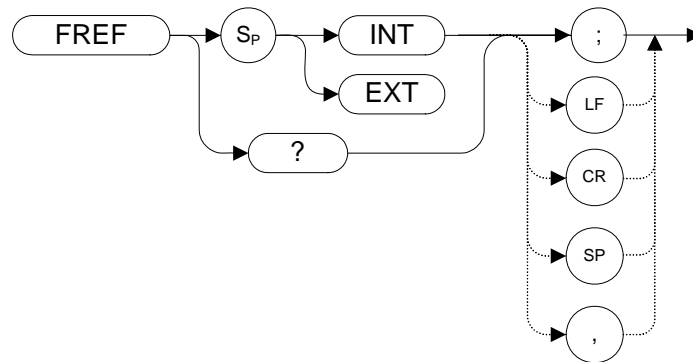
The FOFFSET command selects a value that offsets the frequency scale for all absolute frequency readouts (for example, center frequency). Relative values such as span and marker delta are not offset.

When an offset is in effect, it is displayed beneath the bottom graticule line on the analyzer screen.

Execute “FOFFSET 0;” or “IP;” to turn off the offset.

FREF Frequency Reference

Syntax

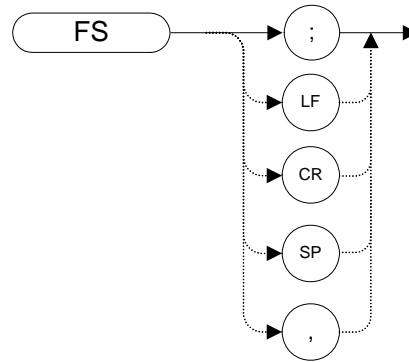


Description

The FREF command specifies whether an external source or an internal source is being used.

FS Full Span

Syntax



Description

The FS command sets the frequency span of the analyzer to full span. Resolution bandwidth, video bandwidth, and sweep time are all set to auto-coupled.

NOTE

Whenever the frequency range of the analyzer you are using does not match the remote language's own range, the span is limited by the capabilities of the replacement analyzer. The tables on the following pages list the frequency ranges for all the supported remote languages when running on any of Agilent's X-series analyzers.

Table 4-11 EXA Series - Frequency Ranges Set by the FS Command

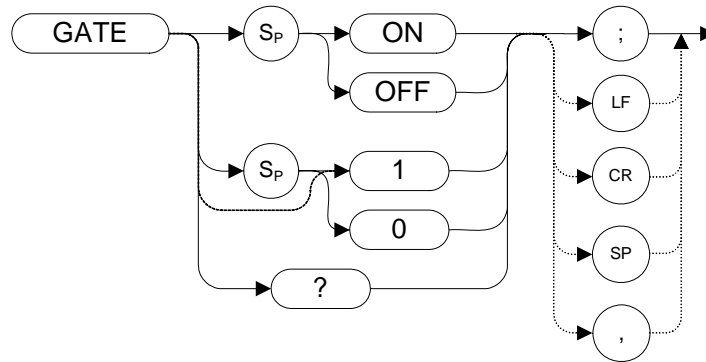
| | N9010A-503 | N9010A-507 | N9010A-513 | N9010A-526 |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| Remote Language | Frequency Range | Frequency Range | Frequency Range | Frequency Range |
| 8560E/EC | 0 Hz - 2.9 GHz | 0 Hz - 2.9 GHz | 0 Hz - 2.9 GHz | 0 Hz - 2.9 GHz |
| 8561E/EC | 0 Hz - 3.6 GHz | 0 Hz - 6.5 GHz | 0 Hz - 6.5 GHz | 0 Hz - 6.5 GHz |
| 8562E/EC | 0 Hz - 3.6 GHz | 0 Hz - 7.0 GHz | 0 Hz - 13.2 GHz | 0 Hz - 13.2 GHz |
| 8563E/EC | 0 Hz - 3.6 GHz | 0 Hz - 7.0 GHz | 0 Hz - 13.6 GHz | 0 Hz - 27.0 GHz |
| 8564E/EC | 0 Hz - 3.6 GHz | 0 Hz - 7.0 GHz | 0 Hz - 13.6 GHz | 0 Hz - 27.0 GHz |
| 8565E/EC | 0 Hz - 3.6 GHz | 0 Hz - 7.0 GHz | 0 Hz - 13.6 GHz | 0 Hz - 27.0 GHz |

Table 4-12 MXA Series - Frequency Ranges Set by the FS Command

| | N9020A-503 | N9020A-508 | N9020A-513 | N9020A-526 |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| Remote Language | Frequency Range | Frequency Range | Frequency Range | Frequency Range |
| 8560E/EC | 0 Hz - 2.9 GHz | 0 Hz - 2.9 GHz | 0 Hz - 2.9 GHz | 0 Hz - 2.9 GHz |
| 8561E/EC | 0 Hz - 3.6 GHz | 0 Hz - 6.5 GHz | 0 Hz - 6.5 GHz | 0 Hz - 6.5 GHz |
| 8562E/EC | 0 Hz - 3.6 GHz | 0 Hz - 8.4 GHz | 0 Hz - 13.2 GHz | 0 Hz - 13.2 GHz |
| 8563E/EC | 0 Hz - 3.6 GHz | 0 Hz - 8.4 GHz | 0 Hz - 13.6 GHz | 0 Hz - 27.0 GHz |
| 8564E/EC | 0 Hz - 3.6 GHz | 0 Hz - 8.4 GHz | 0 Hz - 13.6 GHz | 0 Hz - 27.0 GHz |
| 8565E/EC | 0 Hz - 3.6 GHz | 0 Hz - 8.4 GHz | 0 Hz - 13.6 GHz | 0 Hz - 27.0 GHz |

GATE Gate

Syntax



Preset State: GATE OFF

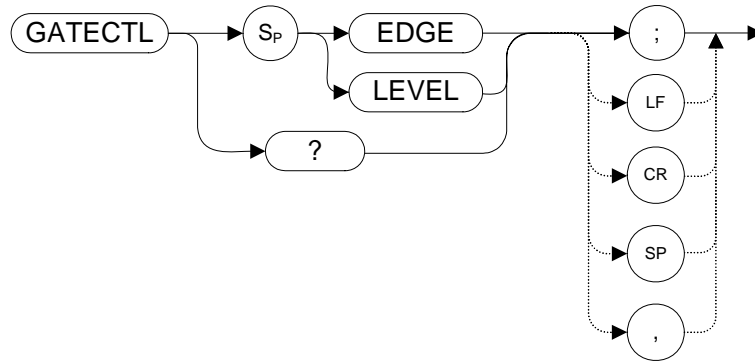
Description

Turns the time-gating function on or off. When the time-gating function is turned on, the analyzer activates the time gate circuitry according to the parameters controlled by gate length (GL), gate delay (GD) and the gate trigger input.

Query response is either 1 or 0, indicating ON or OFF state.

GATECTL Gate Control

Syntax



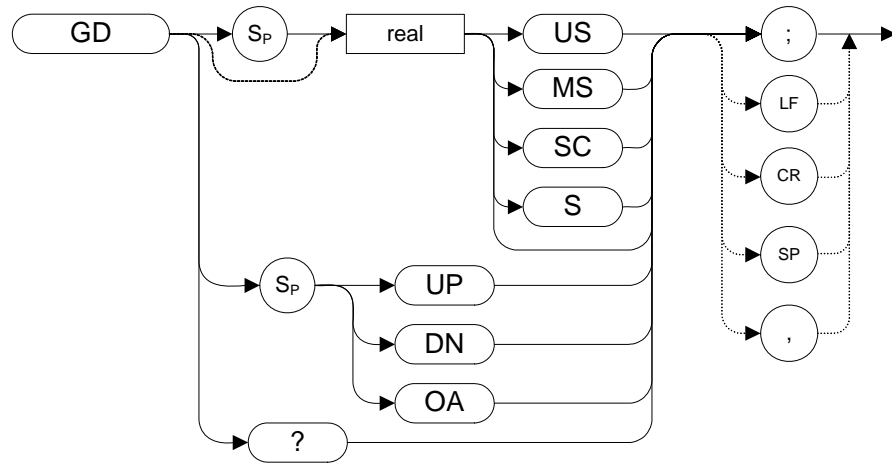
Preset State: GATECTL EDGE

Description

Selects between the edge and level mode for time gate function. In the edge mode, a specified trigger edge starts the gate delay timer that in turn starts the gate length timer. In the level mode, the gate follows the trigger input level. The gate delay timer (GD) and the gate time length (GL) are operational in the edge mode, but not in the level mode.

GD Gate Delay

Syntax



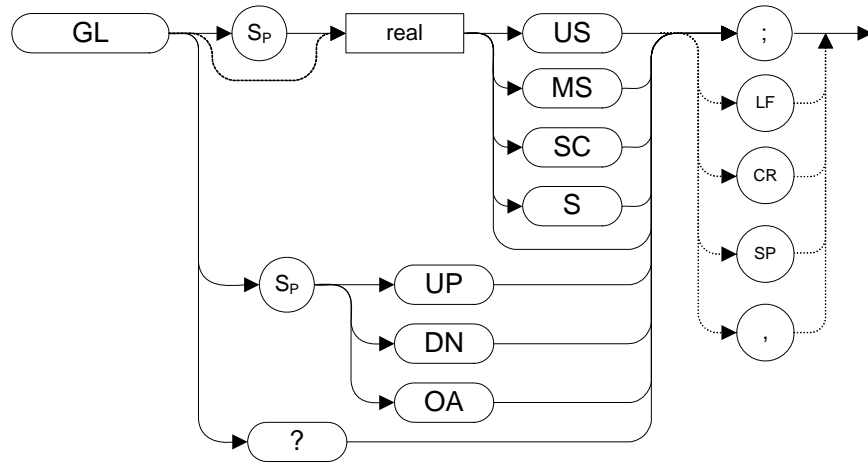
Preset State: 3 μ s

Description

Sets the delay time from when the gate trigger occurs to when the gate is turned on. GD only applies if GATECTL is set to EDGE.

GL Gate Length

Syntax



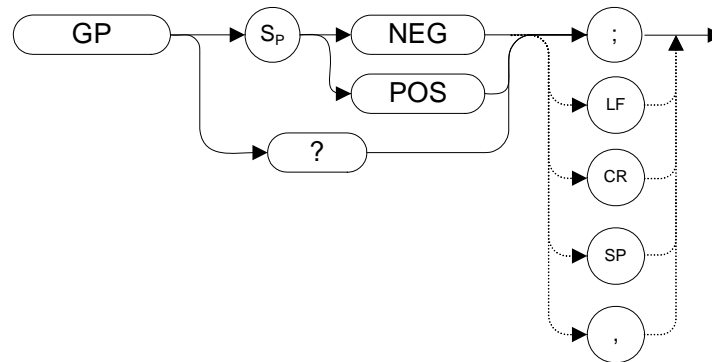
Preset State: 1 μ s

Description

Sets the length of time the time gate is turned on. GL only applies if GATECTL is set to EDGE.

GP Gate Polarity

Syntax



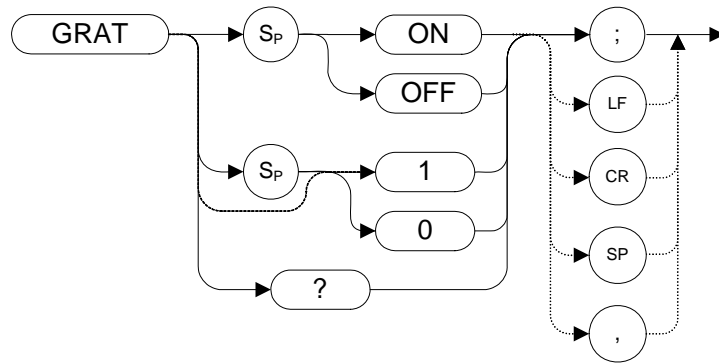
Preset State: GP POS

Description

Sets the polarity (positive or negative) for the gate trigger. If the gate control (GATECTL) is in the edge mode, the gate delay timer can be triggered on either a positive or negative edge of the trigger input. If the gate control is in level mode and positive is selected, the gate is on when the trigger input is high. If the gate control is in level mode and negative is selected, the gate is on when the trigger is low.

GRAT Graticule

Syntax



Preset State: GRAT ON

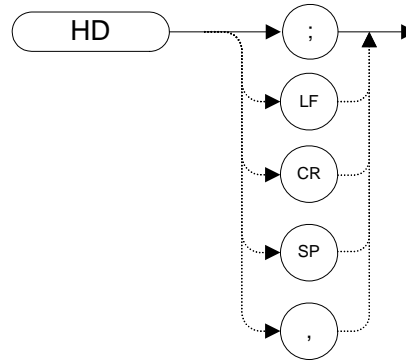
Description

Turns the graticule on or off.

Query response is either 1 or 0, indicating ON or OFF state.

HD Hold Data Entry

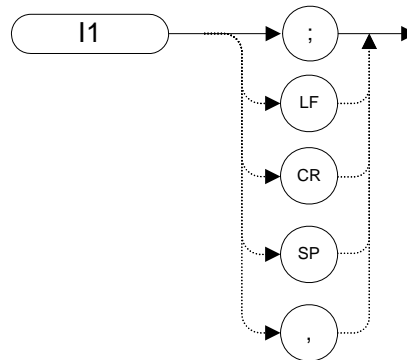
Syntax



Description

Disables data entry via the analyzer numeric keypad, knob, or step keys. The active function readout is blanked, and any active function is deactivated.

I1 [one] Set RF Coupling to DC Syntax



Description

The I1 [one] command sets the RF coupling to DC.

The tables below list the frequency specifications for all EXA series and MXA analyzers for both DC and AC coupling.

Table 4-13

EXA Series Analyzer Frequency Coupling Specifications

| Analyzer Model (N9010A) | DC Coupled Range | | AC Coupled Range | |
|----------------------------|------------------|------------|------------------|------------|
| | Min. Freq. | Max. Freq. | Min. Freq. | Max. Freq. |
| Option 503 | 9 kHz | 3.6 GHz | 10 MHz | 3.6 GHz |
| Option 507 | 9 kHz | 7.0 GHz | 10 MHz | 7.0 GHz |
| Option 513 | 9 kHz | 13.6 GHz | 10 MHz | 13.6 GHz |
| Option 526 | 9 kHz | 27.0 GHz | 10 MHz | 27.0 GHz |

Table 4-14

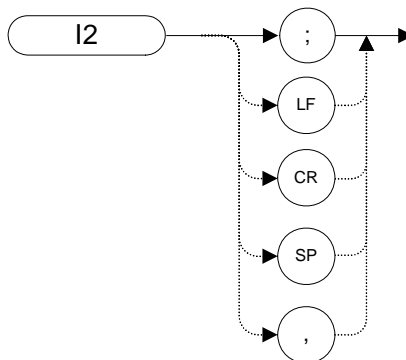
MXA Series Analyzer Frequency Coupling Specifications

| Analyzer Model (N9020A) | DC Coupled Range | | AC Coupled Range | |
|----------------------------|------------------|------------|------------------|------------|
| | Min. Freq. | Max. Freq. | Min. Freq. | Max. Freq. |
| Option 503 | 20 Hz | 3.6 GHz | 10 MHz | 3.6 GHz |
| Option 508 | 20 Hz | 8.4 GHz | 10 MHz | 8.4 GHz |
| Option 513 | 20 Hz | 13.6 GHz | 10 MHz | 13.6 GHz |
| Option 526 | 20 Hz | 27.0 GHz | 10 MHz | 27.0 GHz |

NOTE

The EXA and MXA analyzers only have a single RF input port.

I2 [two]
Set RF Coupling to AC
Syntax



Description

The I2 [two] command sets the RF coupling to AC.

The tables below list the frequency specifications for all EXA series and MXA analyzers for both DC and AC coupling.

Table 4-15 EXA Series Analyzer Frequency Coupling Specifications

| Analyzer Model (N9010A) | DC Coupled Range | | AC Coupled Range | |
|-------------------------|------------------|------------|------------------|------------|
| | Min. Freq. | Max. Freq. | Min. Freq. | Max. Freq. |
| Option 503 | 9 kHz | 3.6 GHz | 10 MHz | 3.6 GHz |
| Option 507 | 9 kHz | 7.0 GHz | 10 MHz | 7.0 GHz |
| Option 513 | 9 kHz | 13.6 GHz | 10 MHz | 13.6 GHz |
| Option 526 | 9 kHz | 27.0 GHz | 10 MHz | 27.0 GHz |

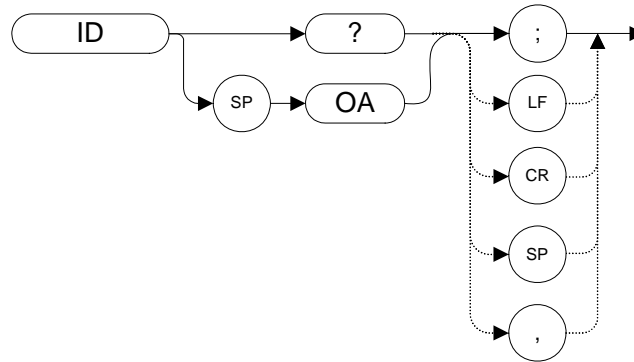
Table 4-16 MXA Series Analyzer Frequency Coupling Specifications

| Analyzer Model (N9020A) | DC Coupled Range | | AC Coupled Range | |
|-------------------------|------------------|------------|------------------|------------|
| | Min. Freq. | Max. Freq. | Min. Freq. | Max. Freq. |
| Option 503 | 20 Hz | 3.6 GHz | 10 MHz | 3.6 GHz |
| Option 508 | 20 Hz | 8.4 GHz | 10 MHz | 8.4 GHz |
| Option 513 | 20 Hz | 13.6 GHz | 10 MHz | 13.6 GHz |
| Option 526 | 20 Hz | 27.0 GHz | 10 MHz | 27.0 GHz |

NOTE The EXA and MXA analyzers only have a single RF input port.

ID Identify

Syntax



Description

The ID command returns the current remote language to the controller (for example, “HP8563E”).

The response value is determined by your remote language selection. This is configured via the front-panel menu selection in Mode Setup when in RLC mode. The remote language selection can also be set using the SCPI command `SYSTEM:LANGUage`.

ID? also works when you are not in RLC mode. In this case the instrument model number is returned. The string that is returned is identical to the second field of text that is returned from the `*IDN?` command.

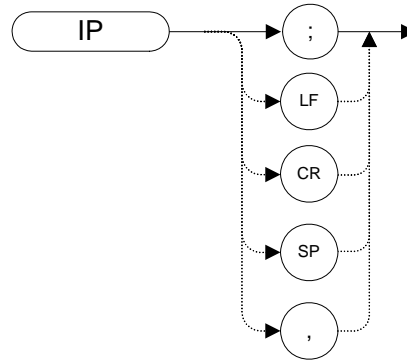
For more information see:

[“Setting up N9061A on the X-Series Analyzer” on page 19](#)

[“Running Software that Requires SCPI Commands” on page 25](#)

IP Instrument Preset

Syntax



Description

Performs an instrument preset, setting the analyzer back to its factory settings.

Instrument preset automatically occurs when you turn on the analyzer. IP is a good starting point for many measurement processes. When IP is executed remotely, the analyzer does not necessarily execute a complete sweep, however. You should execute a take sweep (TS) to ensure that the trace data is valid after an IP.

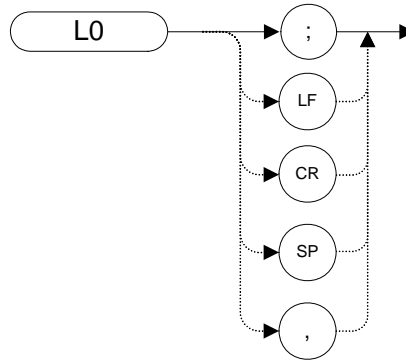
The N9061A application executes this command after any language switch on the X-Series analyzer.

NOTE

If the external amplifier gain has been set, executing an IP command does not reset this value. This is to protect the analyzer.

L0 [zero] Display Line Off

Syntax



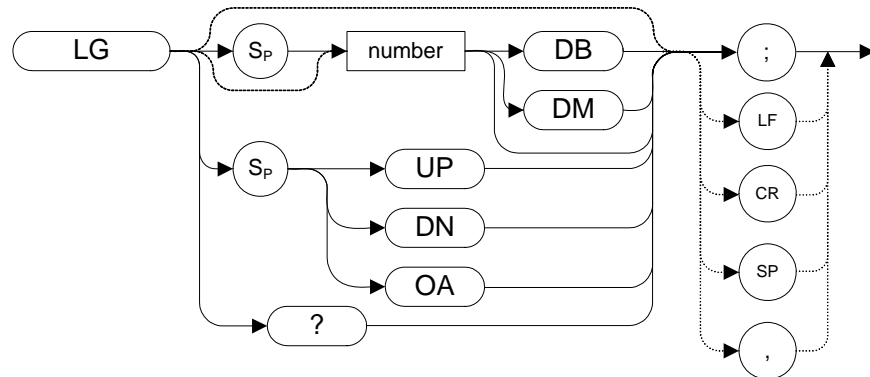
Description

The L0 [zero] command disables the display line.

LG

Logarithmic Scale

Syntax



Description

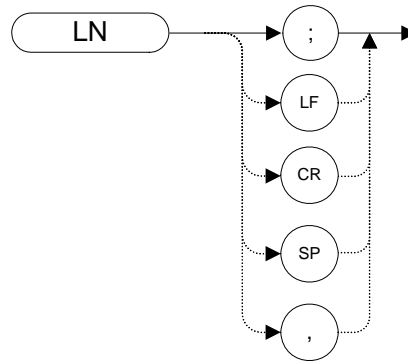
Specifies the amplitude (vertical graticule divisions) as logarithmic units, without changing the reference level. The integer ranges vary between the different remote languages. The following table lists the ranges for each remote language.

Table 4-17

| Remote Language | Integer Range using the LG Command |
|-----------------|------------------------------------|
| 8560E/EC | 1, 2, 5, and 10 |
| 8561E/EC | 1, 2, 5, and 10 |
| 8562E/EC | 1, 2, 5, and 10 |
| 8563E/EC | 1, 2, 5, and 10 |
| 8564E/EC | 1, 2, 5, and 10 |
| 8565E/EC | 1, 2, 5, and 10 |

LN Linear Scale

Syntax

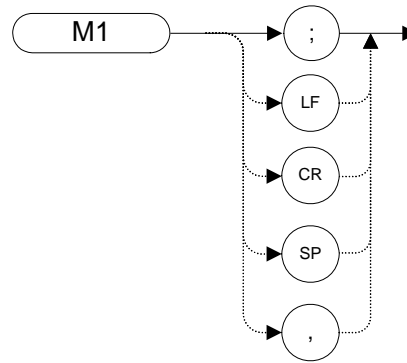


Description

Scales the amplitude (vertical graticule divisions) proportional to the input voltage, without changing the reference level. The bottom line of the graticule represents 0 V.

M1 [*one*] Marker Off

Syntax



Description

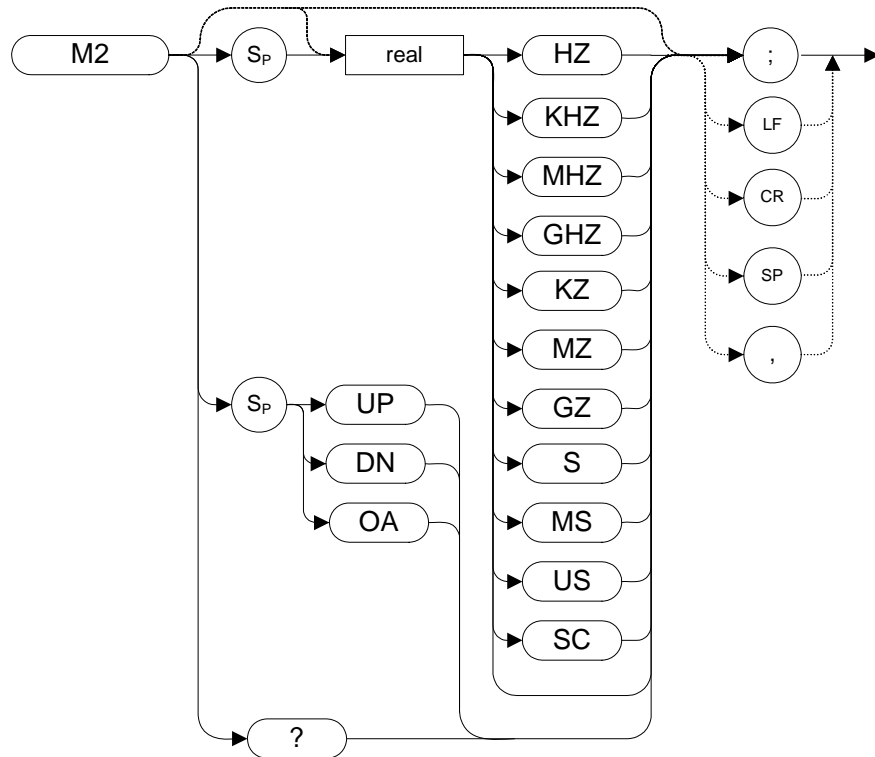
The M1 [*one*] command blanks any markers showing on the display.

NOTE

The functions of the M1 [*one*] command are identical to the MKOFF ALL command ([page 159](#)).

M2 [two] Marker Normal

Syntax



Description

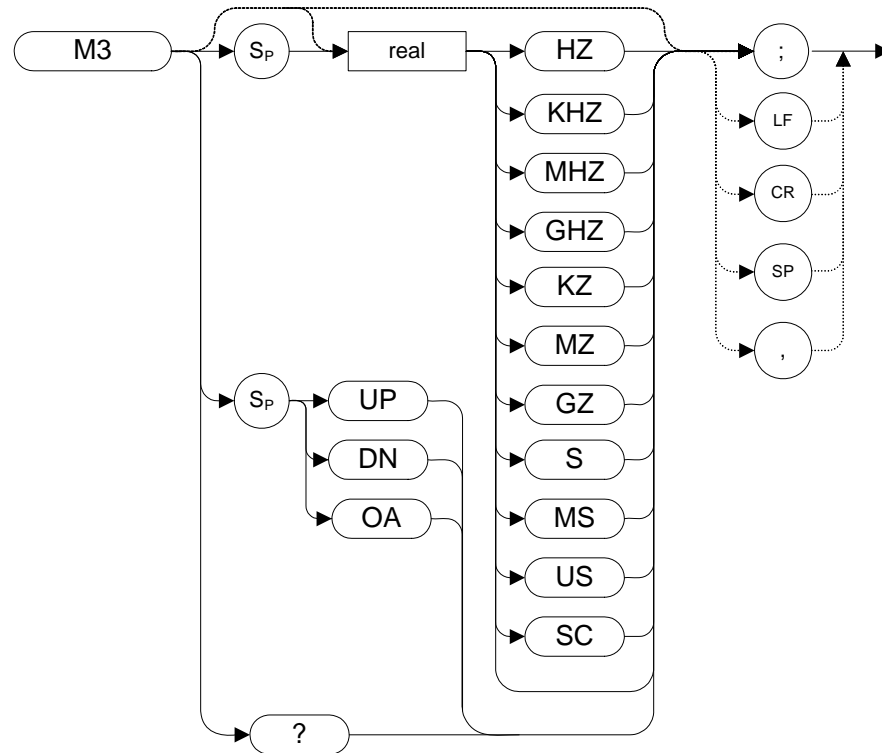
The M2 [two] command moves the active marker to the marker frequency. If the active marker type is not currently normal (for example, if it is delta), the M2 command changes it to a normal marker.

NOTE

The functions of the M2 command are identical to the MKN command (page 157).

M3 [three] Delta Marker

Syntax



Description

The M3 [three] command computes the frequency and amplitude difference between the active marker and the delta (or difference) marker.

If a delta marker is not displayed on the screen, the M3 command places one at the specified frequency or on the right hand edge of the display. If an active marker is not displayed on the screen, the M3 command places an active marker at the center of the screen.

If the M3 command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 148) or the MA command (page 142) is the difference between the noise densities at the reference marker and at the delta marker position.

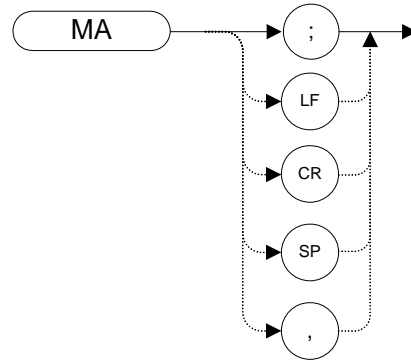
NOTE

If the M3 command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA agrees with that displayed on the screen of the X-Series analyzers.

The functions of the M3 command are identical to the MKD command ([page 151](#)).

MA Marker Amplitude Output

Syntax



Description

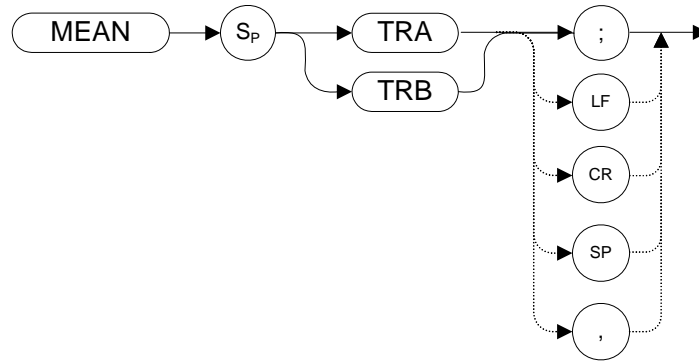
The MA command returns the amplitude level of the active marker if the marker is on the screen. If both the active marker and the delta marker are displayed, the MA command returns the amplitude difference between the two markers.

The marker amplitude is always returned as an ASCII value (TDF P).

The functions of the MA command are identical to the MKA command ([page 148](#)).

MEAN Trace Mean

Syntax



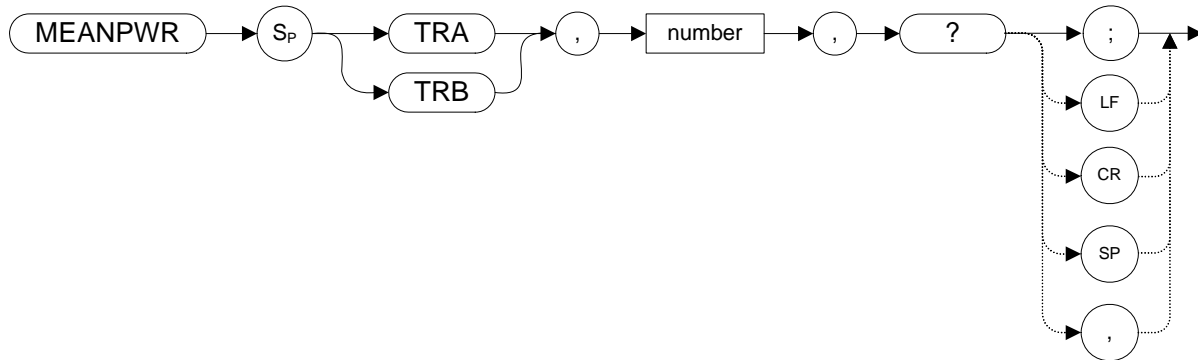
Description

Returns the mean value of the specified trace in display units.

NOTE TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

MEANPWR Mean Power measurement

Syntax



Description

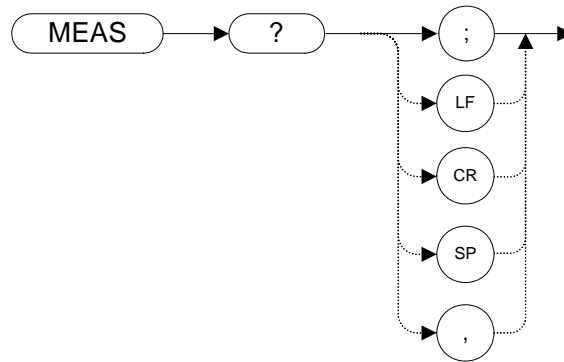
The MEANPWR command measures the average power of the carrier during that portion of the time when it is on. The on state is defined as the time when the signal is within a selected number of dB of its peak level. The range of amplitudes that is defined as the on state can be set with the command. The amplitude range is set relative to the peak value of the signal.

NOTE

The MEANPWR command is similar to the CARRON command ([page 91](#)), except that the CARRON command defines 'on' as that time when the signal is within 20 dB of its peak level.

MEAS Meas

Syntax



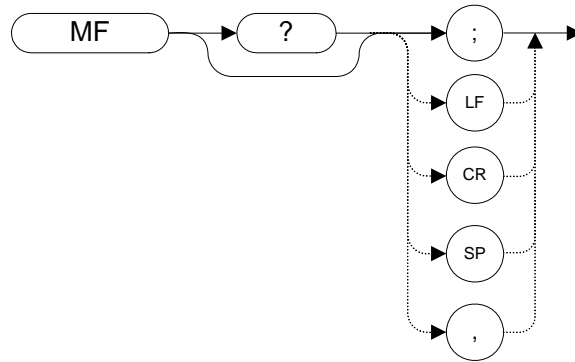
Description

Returns the current sweep status. If the analyzer is set to sweep and make measurements continuously, the command returns CONTS. If it is set to make a single sweep with a single measurement, the command returns SNGLS.

The analyzer can be set to single sweep using the SNGLS command and it can be set to continuous sweep using the CONTS command.

MF Marker Frequency Output

Syntax

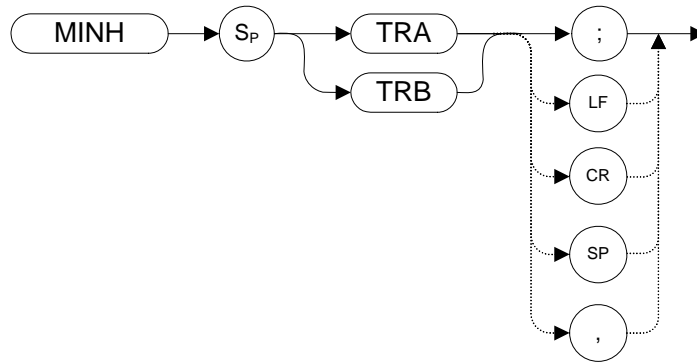


Description

Returns the frequency (or time) of the on-screen active marker. If both an active marker and the delta marker are on the screen, the frequency difference is returned.

MINH Minimum Hold

Syntax



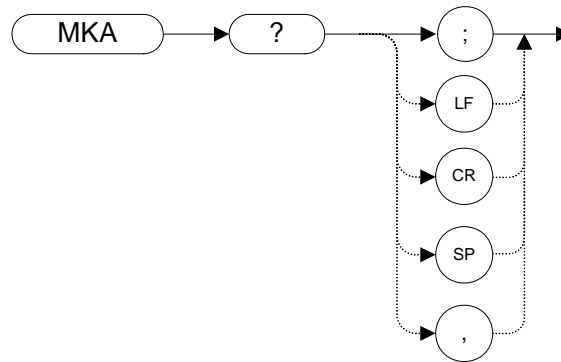
Description

The MINH command updates the chosen trace with the minimum signal level detected at each trace-data point from subsequent sweeps.

For information on the trace settings of the X-series analyzers when legacy instrument trace settings are sent, see [Table 4-4, “8560 series command mapping to X-series for trace/detector settings.”](#)

MKA Marker Amplitude

Syntax



Description

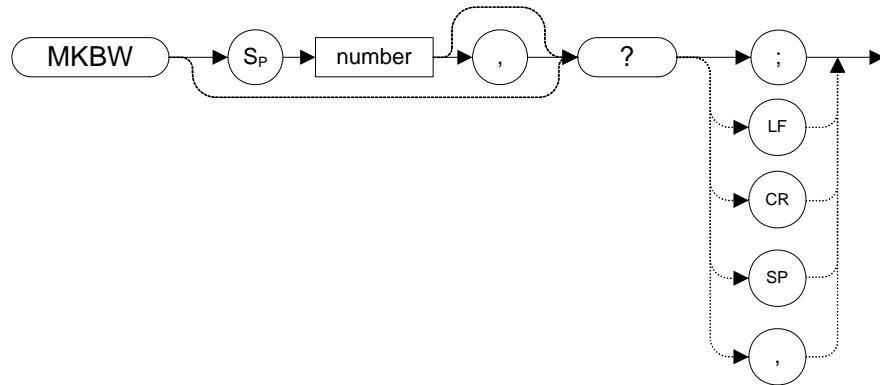
The MKA command returns the amplitude level of the active marker if the marker is on the screen. If both the active marker and the delta marker are displayed, the MKA command returns the amplitude difference between the two markers.

The marker amplitude is always returned as an ASCII value (TDF P).

The functions of the MKA command are identical to the MA command ([page 142](#)).

MKBW Marker Bandwidth

Syntax

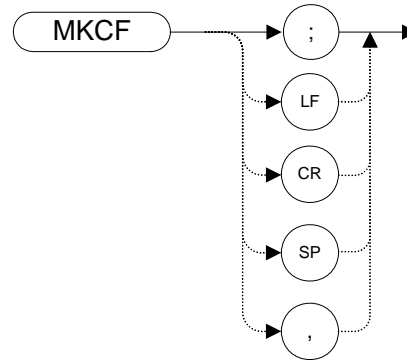


Description

Returns the bandwidth at the specified power level relative to an on-screen marker (if present) or the signal peak (if no on-screen marker is present).

MKCF Marker to Center Frequency

Syntax



Description

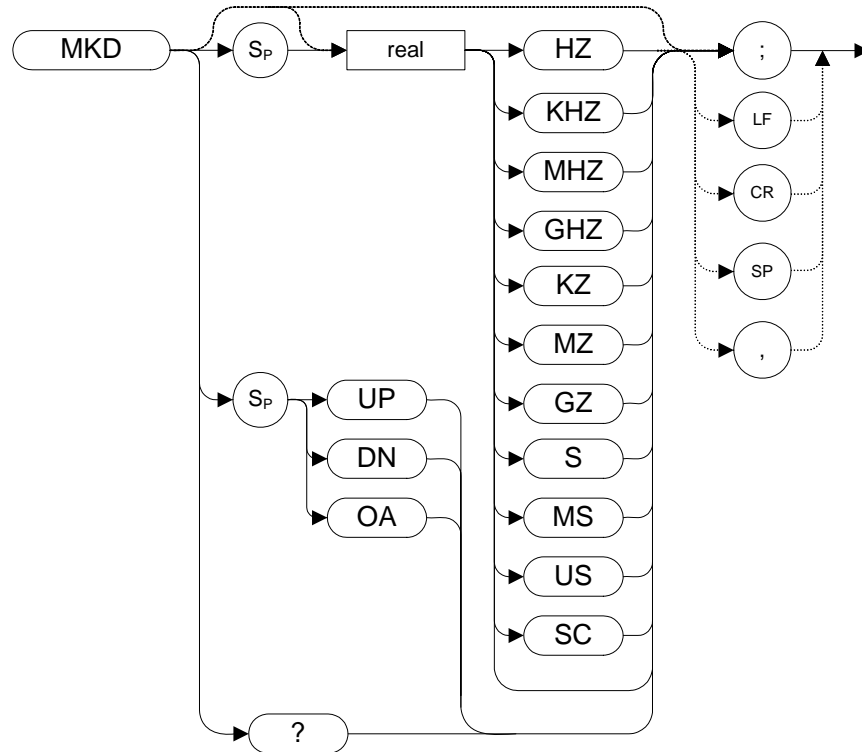
Sets the center frequency equal to the marker frequency and moves the marker to the center of the screen.

NOTE

The functions of the MKCF command are identical to the E2 command ([page 110](#)).

MKD Marker Delta

Syntax



Step Increment: by 1/10 of the frequency span

Description

The MKD command computes the frequency and amplitude difference of the active marker and the delta marker. These values are displayed on the screen.

If a delta marker is not displayed on the screen, the MKD command places one at the specified frequency or on the left or right hand edge of the display. If an active marker is not displayed on the screen, the MKD command places an active marker at the center of the screen.

Programming Commands

MKD Marker Delta

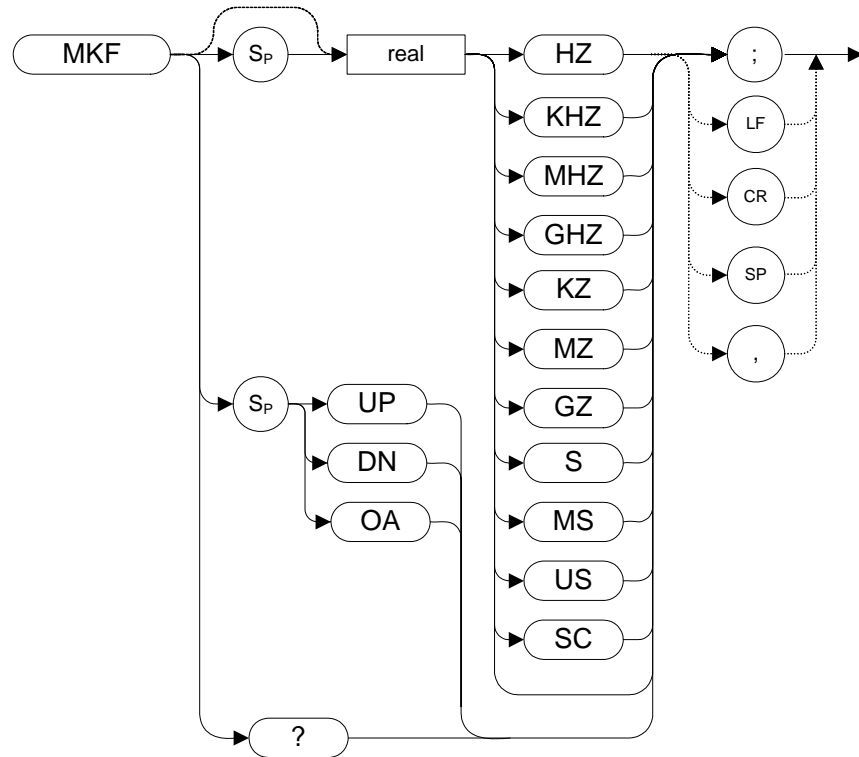
If the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command ([page 148](#)) or the MA command ([page 142](#)) is the difference between the noise densities at the reference marker and at the delta marker position.

If the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA agree with that displayed on the screen of the X-Series analyzers.

The functions of the MKD command are identical to the M3 command ([page 140](#)).

MKF Marker Frequency

Syntax



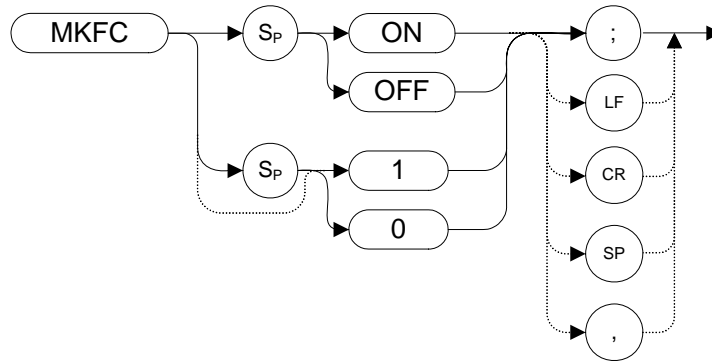
Description

Specifies the frequency value of the active marker.

The data is returned in ASCII format.

MKFC Marker Counter

Syntax

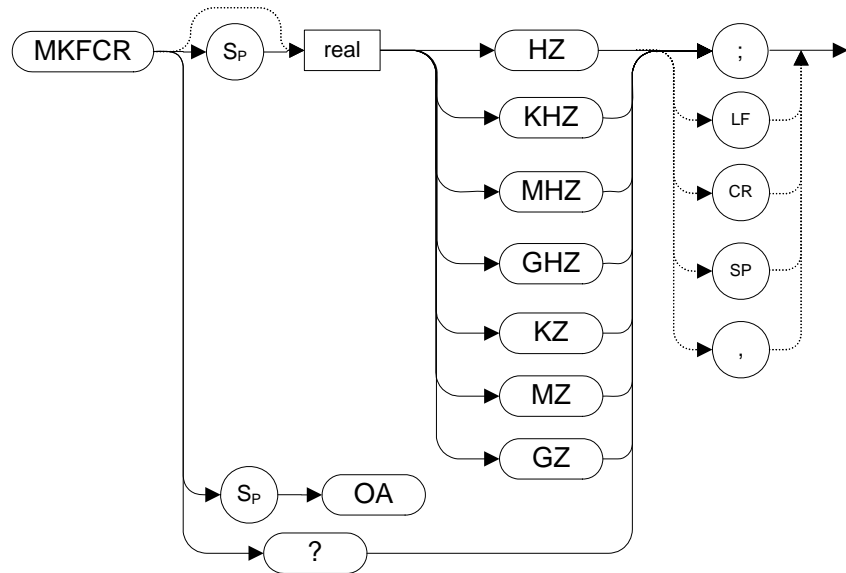


Description

Turns on or off the marker frequency counter. The resolution of the frequency marker counter is determined by the MKFCR command ([page 155](#)).

MKFCR Marker Counter Resolution

Syntax



Description

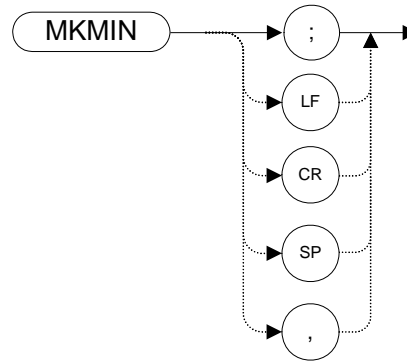
Sets the resolution of the marker frequency counter. The marker counter resolution value is always given either in Hertz or in seconds depending on whether the analyzer is operating in the frequency domain or the time domain.

On the X-Series analyzers, setting the marker frequency resolution causes the Gate Time to change. The Gate Time is calculated using the following formula:

$$\text{Gate Time} = \frac{1}{\text{Resolution Value}}$$

MKMIN Marker Minimum

Syntax

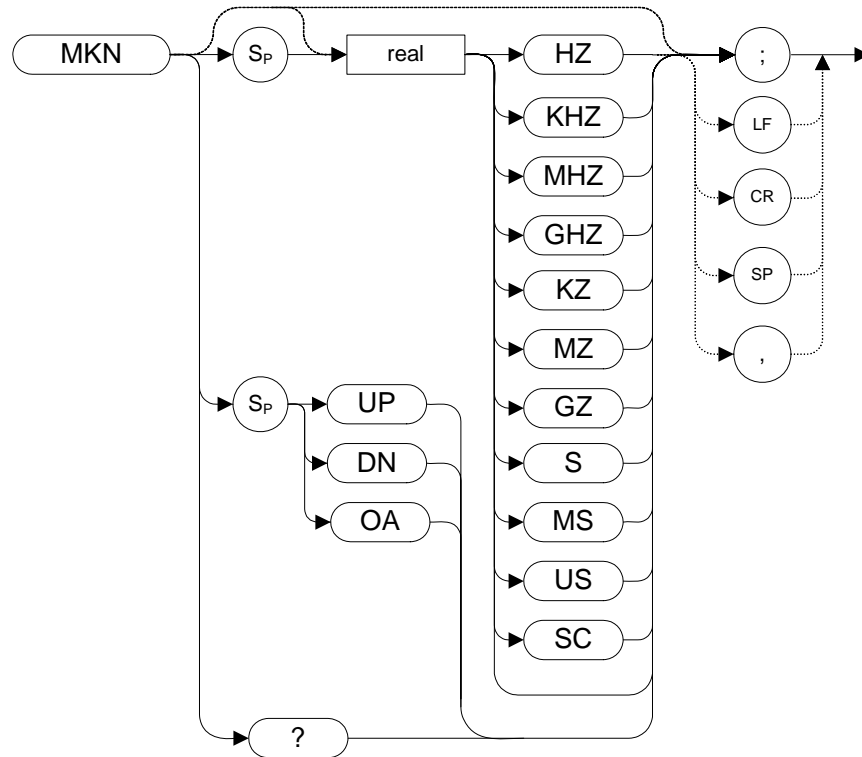


Description

Moves the active marker to the minimum value detected.

MKN Marker Normal

Syntax



Step Increment: by 1/10 of the frequency span.

Description

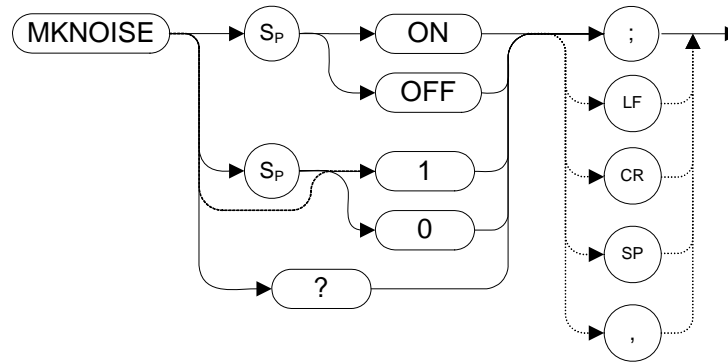
The MKN command moves the active marker to the specified frequency. If no marker is currently turned on, a normal marker is turned on. If the active marker type is not currently normal (for example, it is delta), the MKN command changes it to a normal marker.

NOTE

The functions of the MKN command are identical to the M2 *[two]* command (page 139).

MKNOISE Marker Noise

Syntax



Description

Displays the average RMS noise density at the marker.

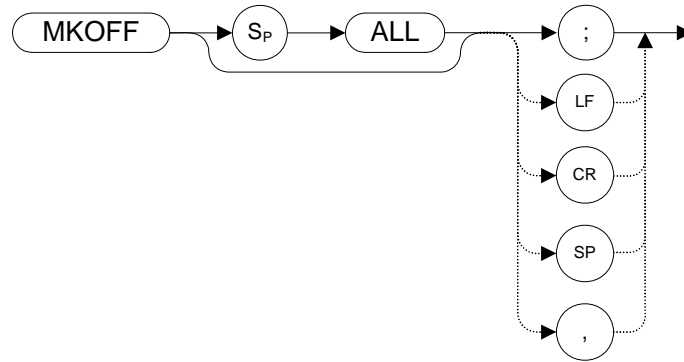
Some differences in marker noise may be seen between the legacy analyzers and the X-Series analyzers due to the greater dynamic range of the X-Series analyzers.

If either the M3 command or the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command ([page 148](#)) or the MA command ([page 142](#)) is the difference between the noise densities at the reference marker and at the delta marker position.

If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA agrees with that displayed on the screen of the X-Series analyzers.

MKOFF Marker Off

Syntax

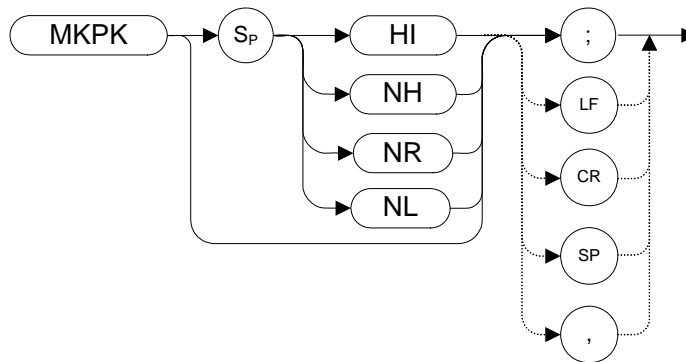


Description

Turns off either the active marker or all the markers. If the ALL parameter is omitted, only the active marker is turned off.

MKPK Marker Peak

Syntax



Description

Executing MKPK HI, or simply MKPK (no secondary keyword), positions the active marker at the highest signal detected. If an active marker is on the screen, the MKPK parameters move the marker as follows:

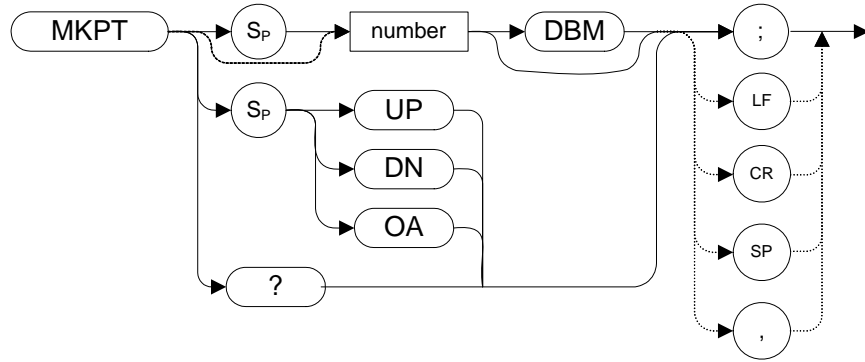
- HI** (highest) moves the active marker to the highest peak.
- NH** (next highest) moves the active marker to the next signal peak of lower amplitude.
- NR** (next right) moves the active marker to the next signal peak to the right of the current marker.
- NL** (next left) moves the active marker to the next signal peak to the left of the current marker.

NOTE The functions of the MKPK command (no secondary keyword) and the MKPK HI command are identical to the E1 commands: [\(page 109\)](#).

NOTE For more details on marker peak excursion, see the MKPX command [\(page 162\)](#).

MKPT Marker Threshold

Syntax

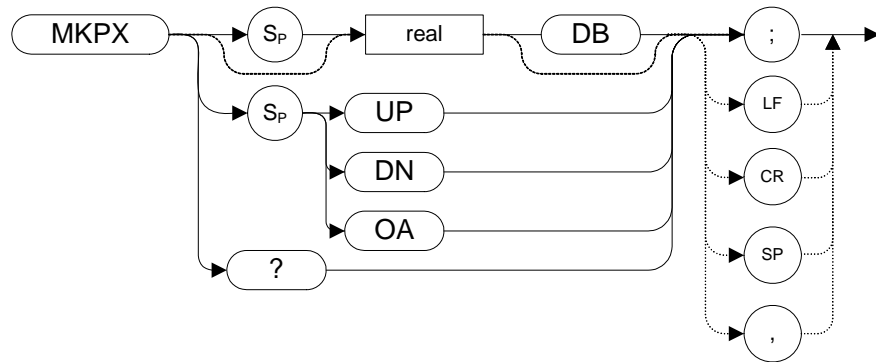


Description

The MKPT command sets the minimum amplitude level from which a peak on the trace can be detected.

MKPX Marker Peak Excursion

Syntax



Preset State: 6 dB

Step Increment: 1 dB

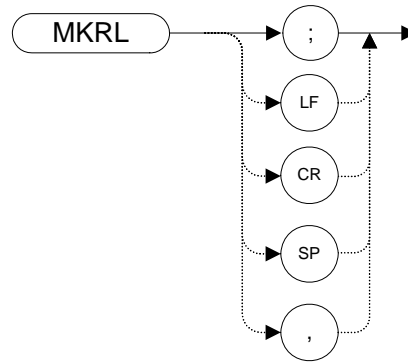
Description

Specifies the minimum signal excursion for the analyzer's internal peak identification routine.

The default value is 6 dB. In this case, any signal with an excursion of less than 6 dB on either side of the marker would not be identified. Thus, if an MKPK NH command were to be executed on such a signal, the analyzer would not place a marker on this signal peak.

MKRL Marker to Reference Level

Syntax



Description

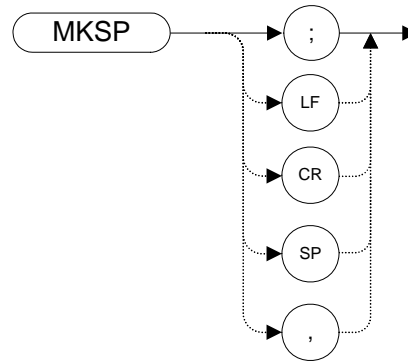
The MKRL command moves the active marker to the reference level.

NOTE

The functions of the MKRL command are identical to the E4 command ([page 112](#)).

MKSP Marker to Span

Syntax



Description

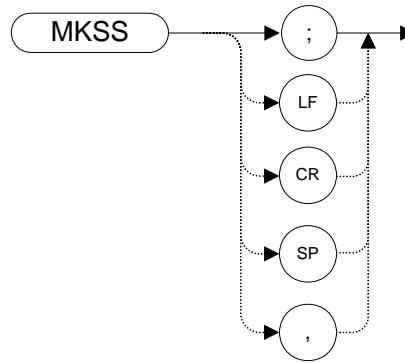
The MKSP command operates only when the delta marker is On (see MKD [\(page 151\)](#) or M3 [\(page 140\)](#)). When the delta marker is On and MKSP is executed, the delta marker and active marker determine the start and stop frequencies. The left marker specifies the start frequency, and the right marker specifies the stop frequency. If marker delta is Off, there is no operation.

NOTE

If the active marker is not a delta marker, there is no change in its position.

MKSS Marker to Step Size

Syntax



Description

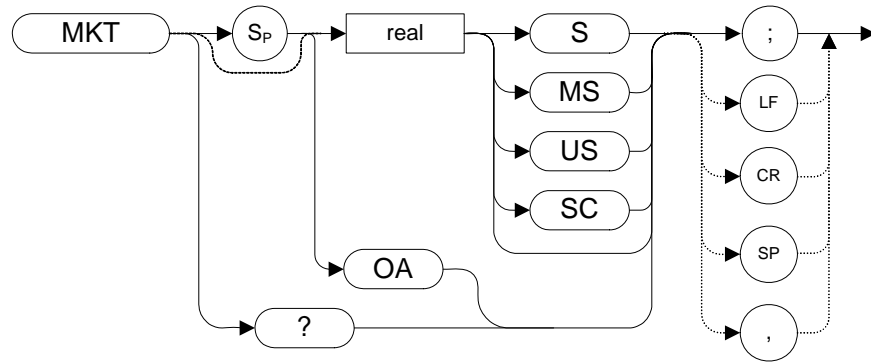
Sets the center-frequency step-size equal to the marker frequency. If the analyzer is in the delta mode, the step size is set to the frequency difference between the active and the delta marker.

NOTE

When the marker is a delta marker, the functions of the MKSS command are identical to the E3 command ([page 111](#)).

MKT Marker Time

Syntax



Description

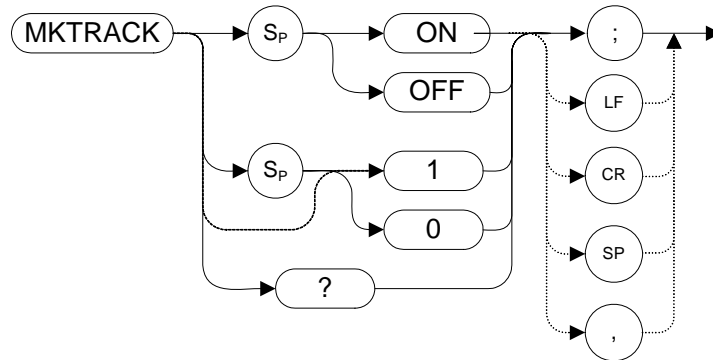
Places a marker at a position that corresponds to a specified point in time during the sweep.

NOTE

The default unit of time is seconds ('S' or 'SC').

MKTRACK Marker Track

Syntax



Description

Moves the signal on which the active marker is located to the center of the analyzer display and keeps the signal peak at center screen.

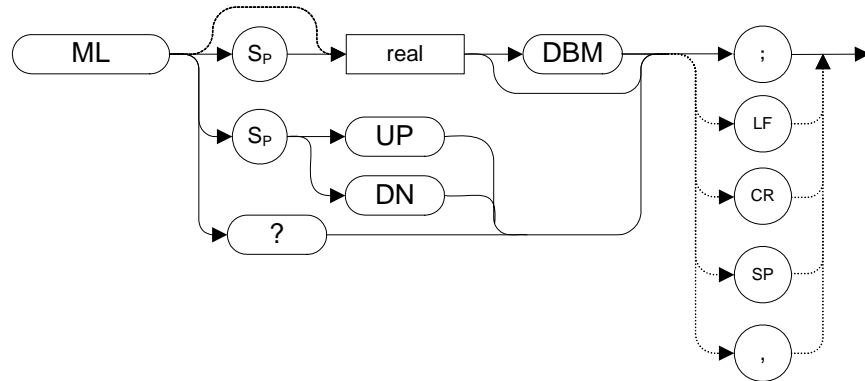
To keep a drifting signal at center screen, place the active marker on the desired signal before turning on MKTRACK.

NOTE

The functions of the MKTRACK command are identical to the MT0 [*zero*] command ([page 169](#)) and the MT1 [*one*] command ([page 170](#)).

ML Mixer Level

Syntax



Description

The ML command specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level.

The effective mixer level is equal to the reference level minus the input attenuator setting.

NOTE

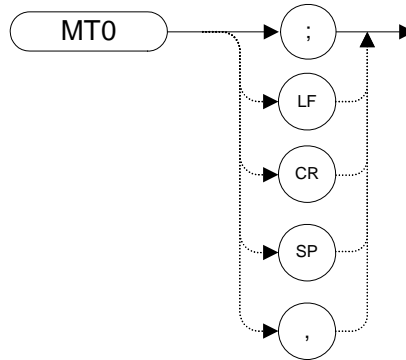
If an external amplifier gain value is set, the mixer level is determined using the following equation:

$$\text{Mixer Level} = \text{Ref. Level} - \text{Attenuation} + \text{Ext. Amplifier Gain}$$

The external amplifier gain is not preset by doing an IP command in case the analyzer is measuring a large signal. This is to protect the analyzer from damage from a large signal. For a helpful suggestion, see [Chapter 3](#), “Hints and Tips,” on [page 45](#).

MT0 [zero] Marker Track Off

Syntax



Description

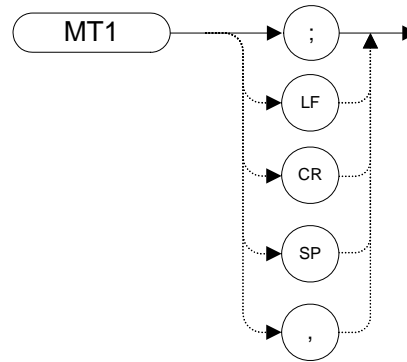
The MT0 [zero] command disables the marker tracking mode.

NOTE

The functions of the MT0 [zero] command are identical to the MKTRACK OFF command ([page 167](#)).

MT1 [one] Marker Track On

Syntax



Description

Moves the signal on which the active marker is located to the center of the analyzer display and keeps the signal peak at center screen.

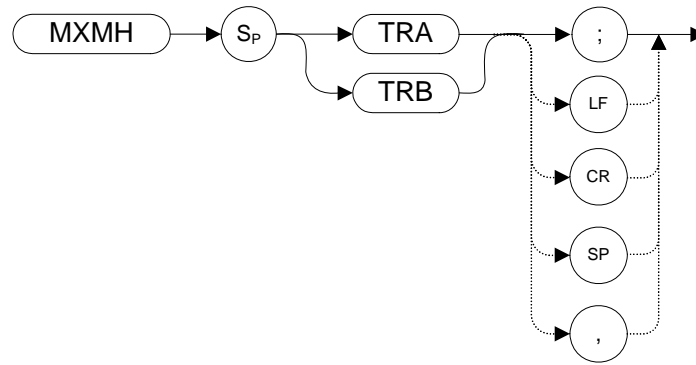
To keep a drifting signal at center screen, place the active marker on the desired signal before issuing an MT1 [one] command.

NOTE

The functions of the MT1 command are identical to the MKTRACK ON command ([page 167](#)).

MXMH Maximum Hold

Syntax



Description

Updates each trace element with the maximum level detected.

MXMH updates the specified trace (either Trace A or Trace B) with a new value from a detector only if the new value is larger than the previous trace data value.

NOTE The functions of the MXMH command are identical to the A2 command (page 52) and B2 command (page 81).

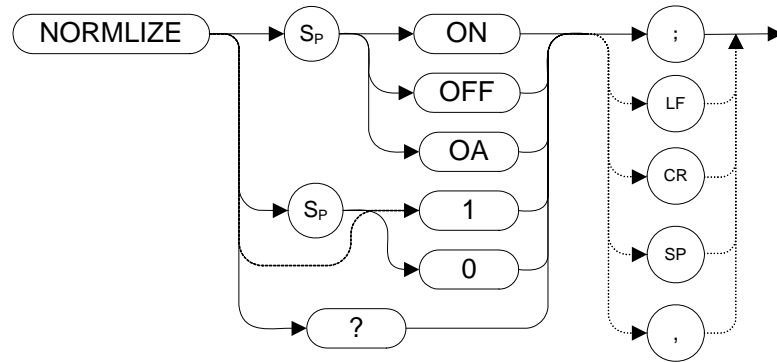
NOTE TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

For information on the trace settings of the X-series analyzers when legacy instrument trace settings are sent, see [Table 4-4, “8560 series command mapping to X-series for trace/detector settings.”](#)

NORMLIZE

Normalize Trace Data

Syntax



The preset state is OFF.

Description

Activates or de-activates the normalization routine for stimulus-response measurements. This function subtracts trace B from trace A, offsets the result by the value of the normalized reference position (NRL) and displays the result in trace A.

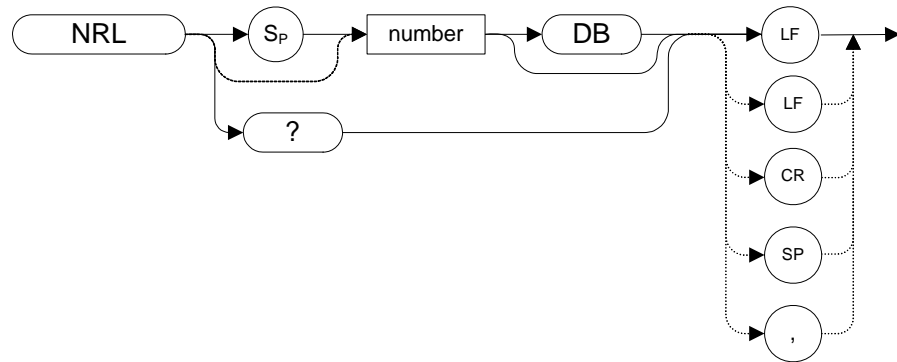
If active (ON), the NORMLIZE command is automatically turned off with an instrument preset (IP) or at power on.

The OA option only returns the current value to the controller; it does not set the active function to the normalization state.

Normalization is not available when using linear mode and is mutually exclusive with other trace math.

NRL Normalized Reference Level

Syntax



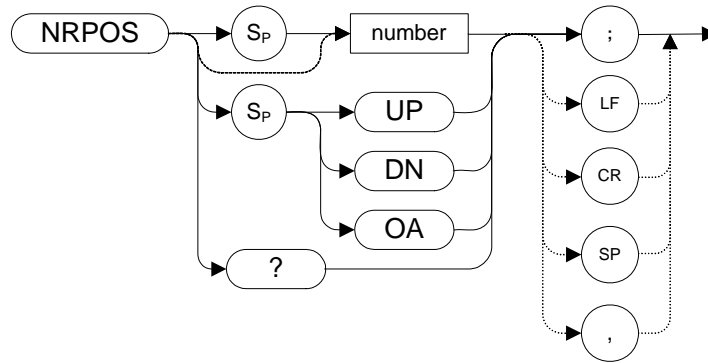
The preset value is 0 dB.

Description

Sets the normalized reference level. It is intended to be used with the NORMLIZE command. When using NRL, the input attenuator and IF step gains are not affected. This function is a trace-offset function enabling the user to offset the displayed trace without introducing hardware switching errors into the stimulus-response measurement. The unit of measure for NRL is dB.

NRPOS Normalized Reference Position

Syntax



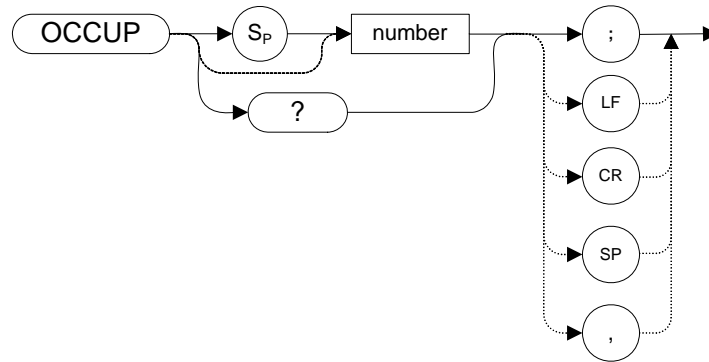
The preset value is 10.

Description

The NRPOS command adjusts the normalized reference-position that corresponds to the position on the graticule where the difference between the measured and calibrated traces reside. The dB value of the normalized reference position is equal to the normalized reference level. The normalized reference position can be adjusted between 0.0 and 10.0, corresponding to the bottom and top graticule lines, respectively.

OCCUP Percent Occupied Power Bandwidth

Syntax



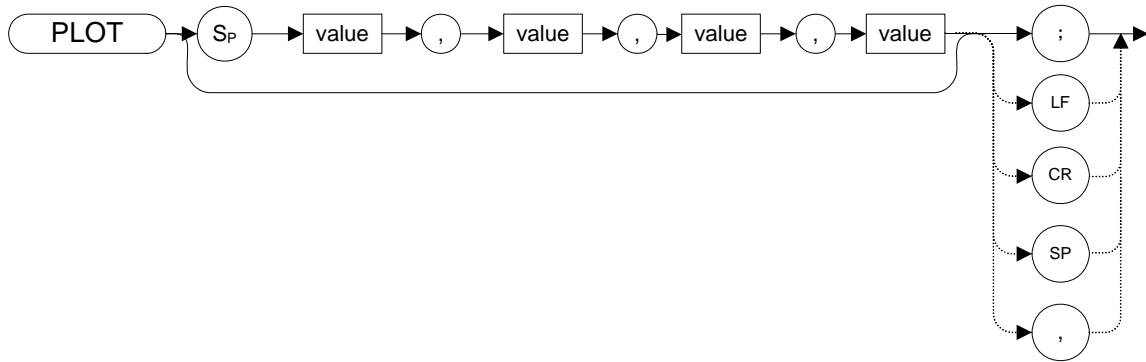
Description

The OCCUP command is used to query the current value of the percent occupied power. This value is set by the DELMKBW ([page 104](#)) and the PWRBW command ([page 179](#)) command. The OCCUP command can also be used to set the percent occupied power.

PLOT

Plot

Syntax



Description

The PLOT command allows you transfer trace data, graticule and annotation information to a printer using a parallel port.

The legacy analyzers transferred data directly to a plotter via the GPIB connection. The PLOT command now transfers data to a printer, and prints the entire screen.

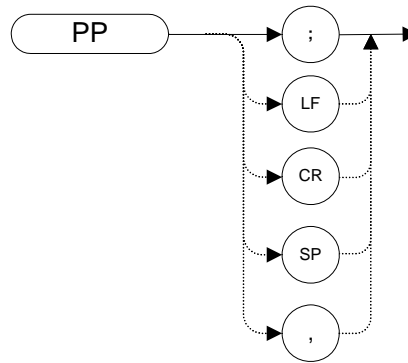
Although the PLOT command reads in plotter dimension values, these are ignored.

NOTE

In legacy instruments, the PLOT command also returns HPGL. The X-series instruments with the N9061A application installed does not return HPGL.

PP Preselector Peak

Syntax

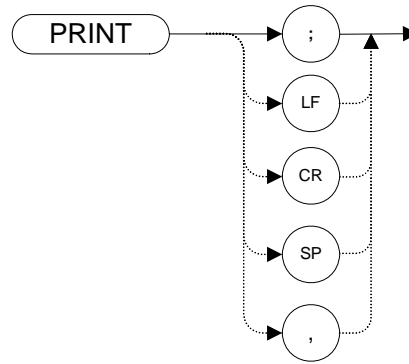


Description

The PP command optimizes preselector tracking to peak the amplitude of a signal at the active marker. If a marker is not on the screen, PP places a marker at the highest signal level, and optimizes preselector tracking at that frequency.

NOTE

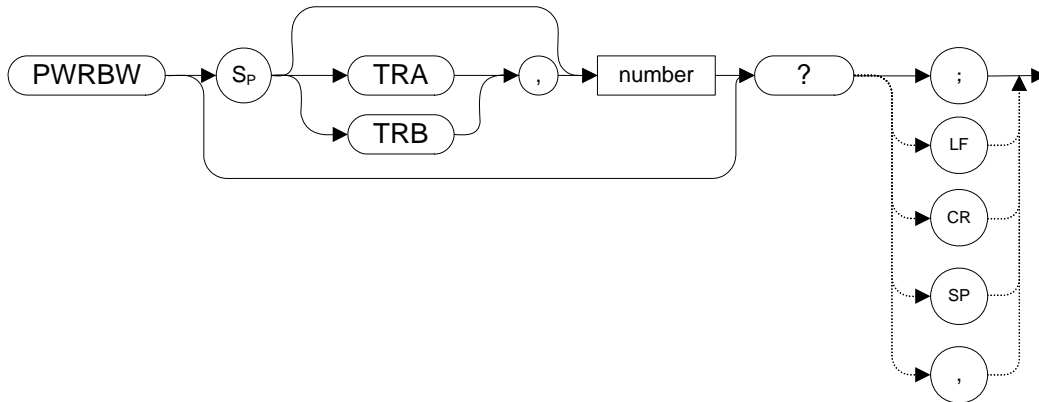
This command is only supported when the X-series analyzer's maximum frequency limit is greater than 3.6 GHz. If the command is issued on an analyzer with a maximum frequency limit of 3.6 GHz or less the command is not implemented and no error is generated.

PRINT
Print**Syntax****Description**

Transfers trace data, graticule and annotation of the analyzer screen directly to the X-series analyzer's default printer.

PWRBW Power Bandwidth

Syntax



Description

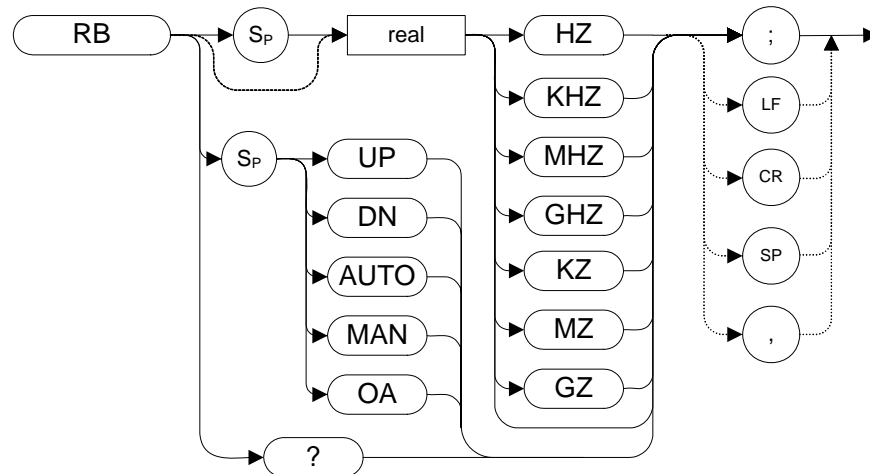
Computes the combined power of all signal responses in the specified trace, and returns the bandwidth of the specified percentage of total power. The number in the command is a percentage value, that is, it has a range of 0 to 100.

NOTE

If the percent total power is 100%, the power bandwidth equals the frequency span.

RB Resolution Bandwidth

Syntax



Preset State: 1 MHz, auto coupled

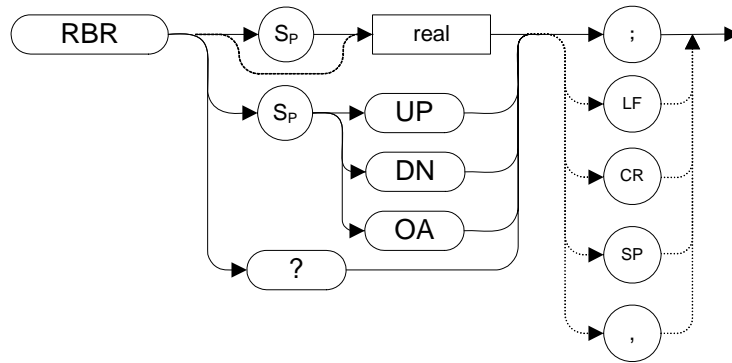
Step Increment: In a 1, 3, 10 series

Description

The RB command specifies the resolution bandwidth. Available bandwidths are 1 Hz, 3 Hz, 10 Hz, 30 Hz, 300 Hz, 1 kHz, 3kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, and 3 MHz. The resolution bandwidths, video bandwidths, and sweep time are normally coupled. Executing RB decouples them. Execute CR ([page 100](#)) to re-establish coupling.

RBR Resolution Bandwidth to Span Ratio

Syntax

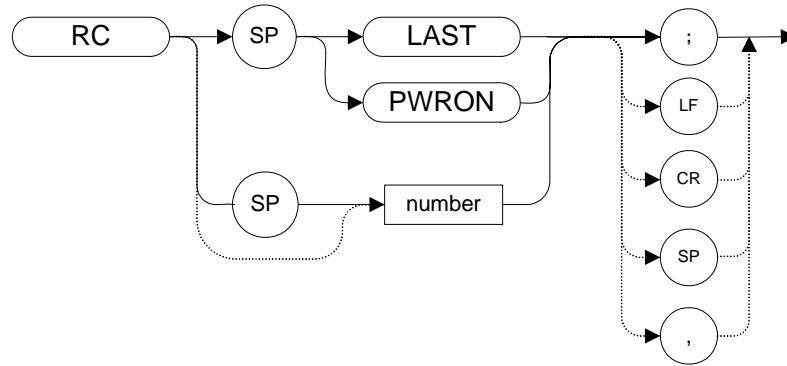


Description

This command sets the coupling ratio between the frequency span and the resolution bandwidth. It allows you to set the Span/RBW ratio to $1/\langle\text{value}\rangle$, where $\langle\text{value}\rangle$ is set by the user.

RC Recall State

Syntax



Description

Recalls analyzer state data from the specified state register in the analyzer's memory.

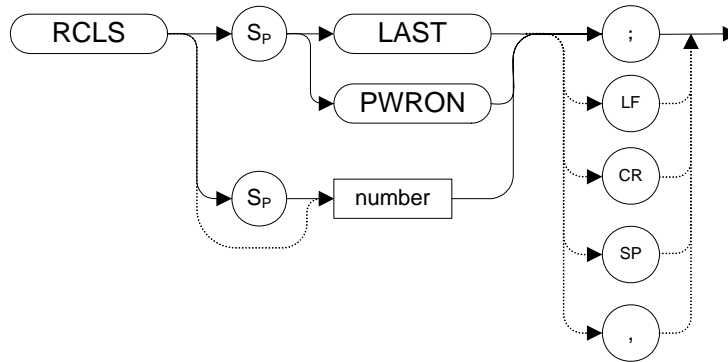
Registers one through six are reserved for the user, and contain instrument states (such as front panel configuration) saved with the SAVES command ([page 190](#)) or the SV command ([page 201](#)).

NOTE

The functions of the RC command are identical to the RCLS command ([page 183](#)).

RCLS Recall State

Syntax



Description

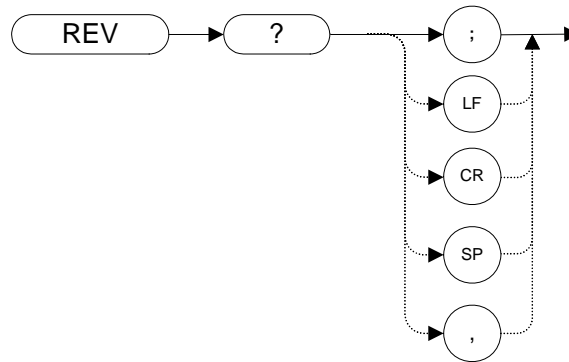
Recalls analyzer state data from the specified state register in the analyzer's memory.

Registers one through six are reserved for the user, and contain instrument states (such as front panel configuration) saved with the SAVES command ([page 190](#)) or the SV command ([page 201](#)).

The functions of the RCLS command are identical to the RC command ([page 182](#)).

REV Revision

Syntax



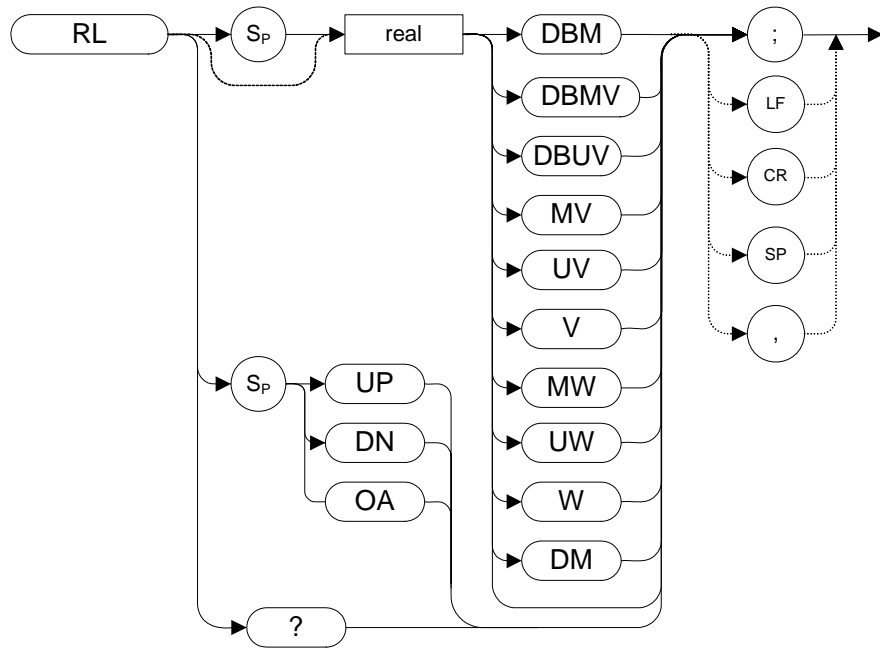
Description

The REV command returns the firmware revision number.

In X-Series analyzers, this command returns the build date of the N9061A application that you have installed in your analyzer. The date is returned in YYMMDD format (where YY is the number of years since 1950, and MM is the month and DD is the date).

RL Reference Level

Syntax



Description

Specifies the amplitude level of the top graticule line on the display. This represents the reference level.

CAUTION

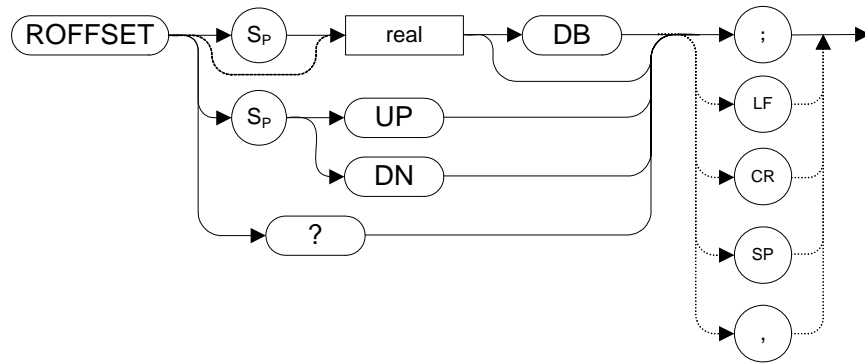
Signal levels above +30 dBm will damage the analyzer. For a helpful suggestion on this subject, see [Chapter 3](#), “Hints and Tips,” on page 45.

NOTE

If the display line is on, changing the reference level does not adjust the position of the display line.

ROFFSET Reference Level Offset

Syntax



Description

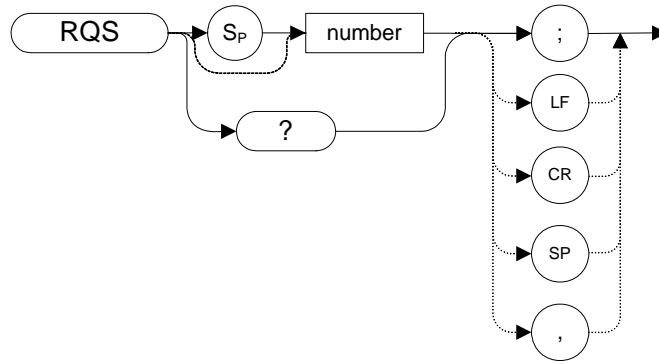
Offsets all amplitude readouts without affecting the trace.

Once activated, the ROFFSET command displays the amplitude offset on the left side of the screen.

Entering ROFFSET 0 or presetting the analyzer eliminates an amplitude offset.

RQS Request Service Conditions

Syntax

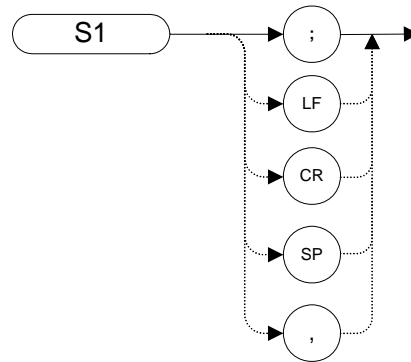


Description

Sets a bit mask for service requests.

S1[one] Continuous Sweep

Syntax



Description

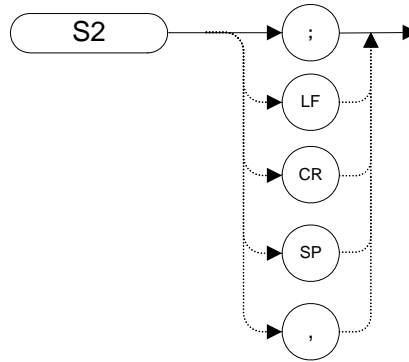
The S1 command sets the analyzer to continuous sweep mode. In the continuous sweep mode, the analyzer takes its next sweep as soon as possible after the current sweep (as long as the trigger conditions are met). A sweep may temporarily be interrupted by data entries made over the remote interface.

NOTE

The functions of the command S1 are identical to the CONTS command ([page 98](#)).

S2 [two] Single Sweep

Syntax



Description

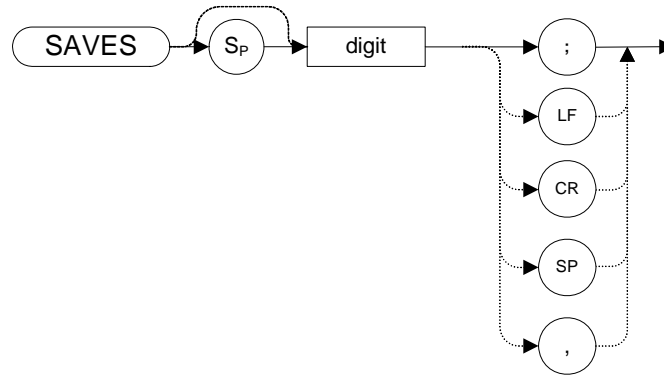
The S2 command sets the analyzer to single sweep mode. Each subsequent time that the command S2 is sent, one sweep is started if the trigger conditions are met.

NOTE

The functions of the S2 command are similar to the SNGLS command ([page 194](#)).

SAVES Save State

Syntax



Description

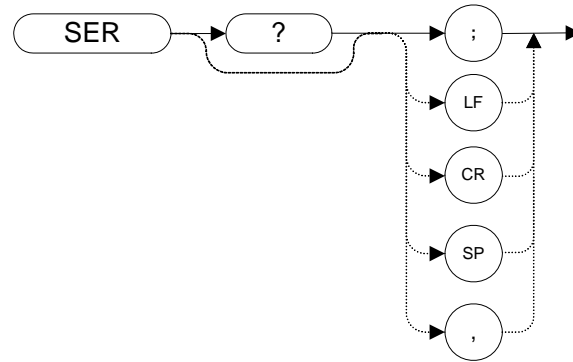
Saves the current state of the analyzer in any of the registers one through six.

NOTE

The functions of the SAVES command are identical to the SV command ([page 201](#)).

SER Serial Number

Syntax



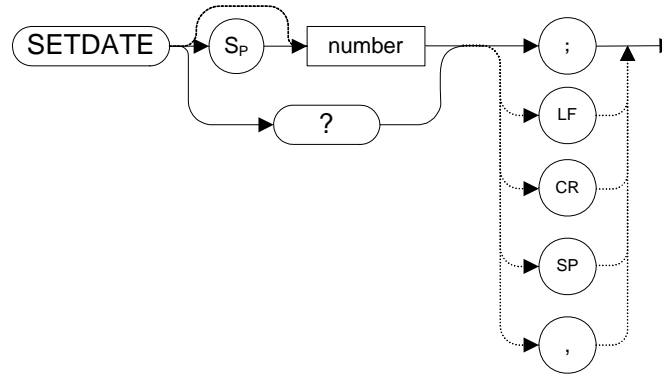
Description

The SER command returns the X-series analyzer serial number to the controller.

SETDATE

Set Date

Syntax

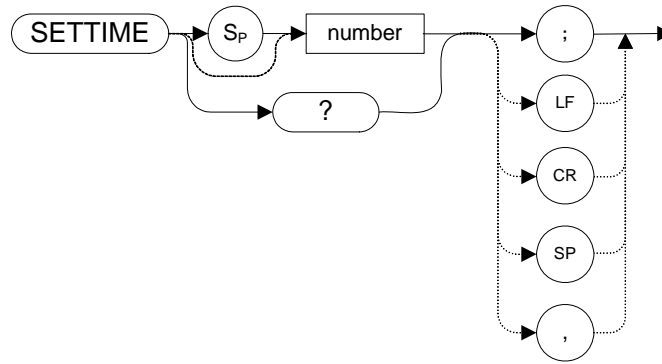


Description

The SETDATE command sets the date of the real-time clock of the analyzer. The date takes the form YYMMDD (Year, Month, Day)

SETTIME Set Time

Syntax

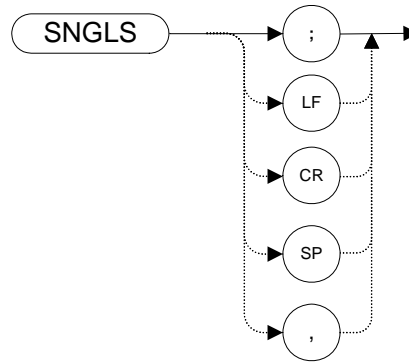


Description

The SETTIME command sets the date of the real-time clock of the analyzer. The time takes the form HHMMSS (Hour, Minute, Second)

SNGLS Single Sweep

Syntax



Description

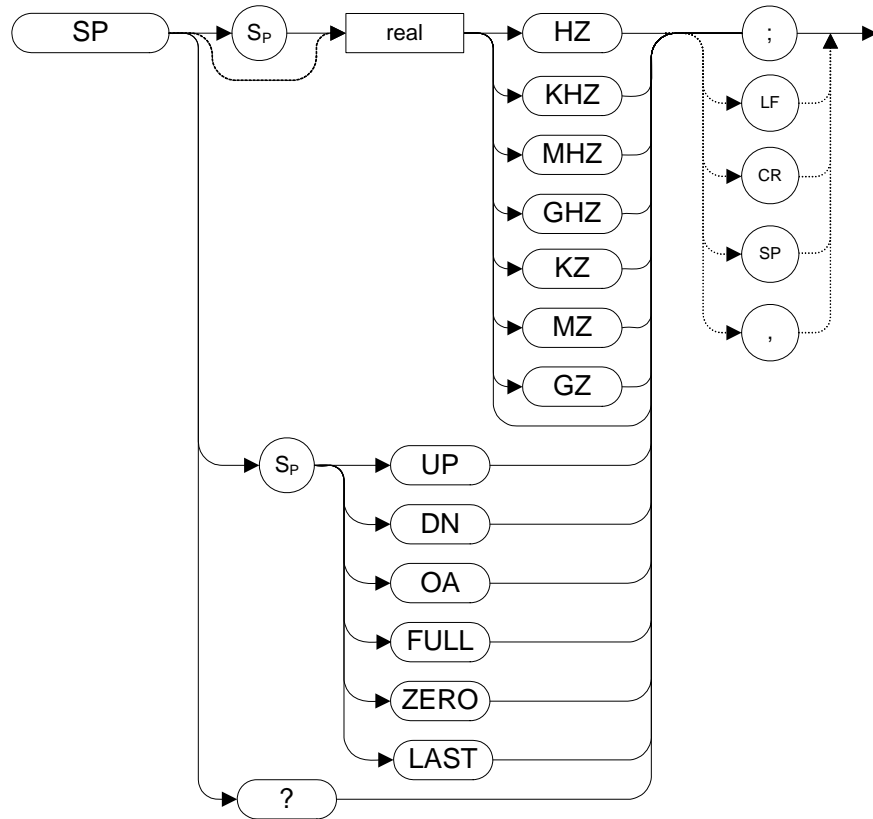
Sets the analyzer to single-sweep mode. Each time TS (take sweep) is sent, one sweep taken as long as the trigger conditions are met.

NOTE

The functions of the SNGLS command are identical to the S2 command ([page 189](#)).

SP Frequency Span

Syntax



Step Increment: 1, 2, 5, 10 sequence (up to the stop frequency of the analyzer)

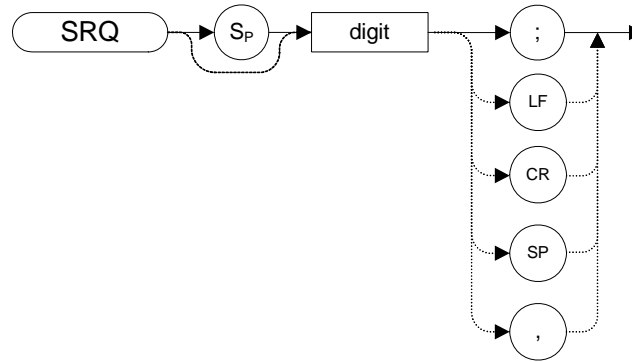
Description

Changes the total displayed frequency range symmetrically about the center frequency.

If resolution and video bandwidths are coupled to the span width, the bandwidths change with the span width to provide a predetermined level of resolution and noise averaging. Likewise, the sweep time changes to maintain a calibrated display, if coupled. All of these functions are normally coupled, unless RB (page 180), VB (page 219), or ST (page 198) have been executed.

SRQ Service Request

Syntax



Description

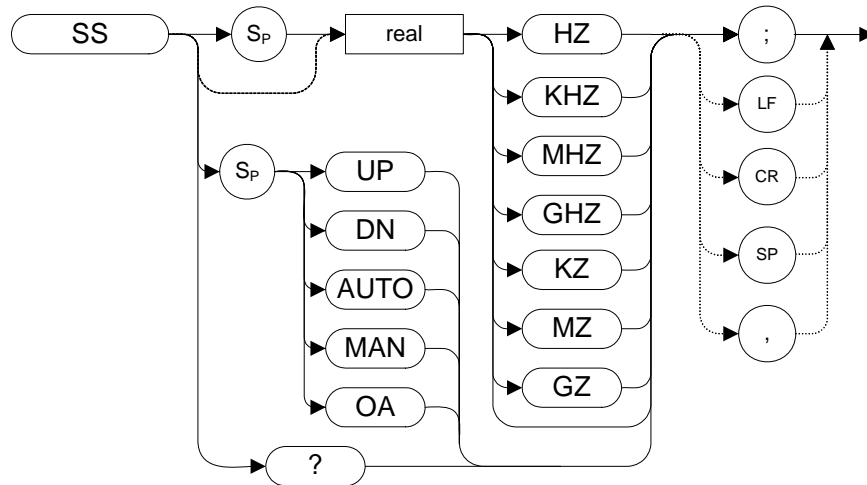
The SRQ command sends a service request to the controller when the SRQ operand fits the mask supplied with the RQS command.

NOTE

The N9061A application does not support the setting of bit 1 (units-key-pressed) of the status byte. Bit-1 of the status byte is always set to Off.

SS Center Frequency Step Size

Syntax

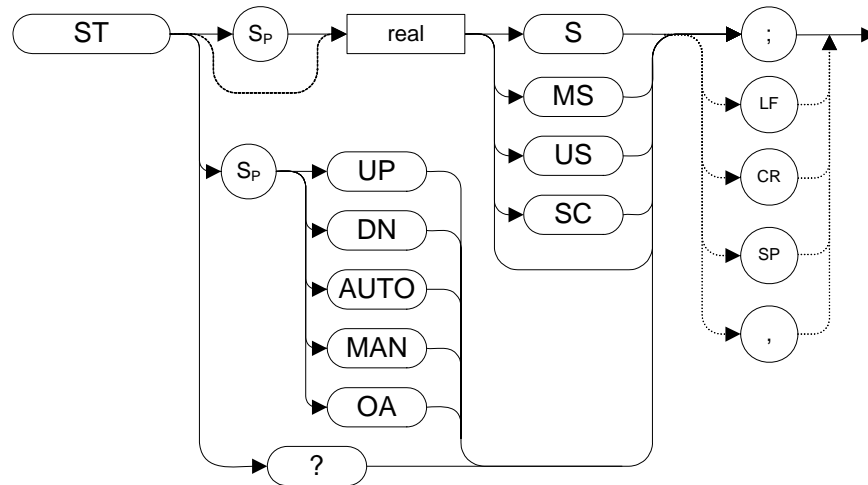


Description

The SS command specifies center frequency step size.

ST Sweep Time

Syntax



Description

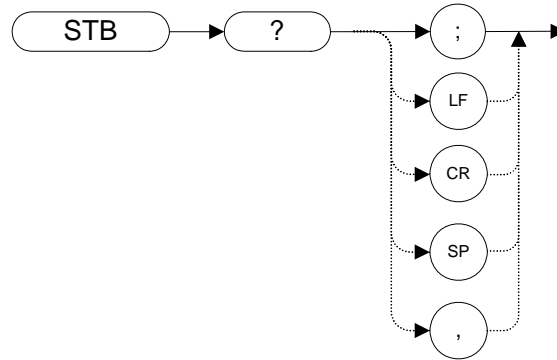
The ST command specifies the time in which the analyzer sweeps the displayed frequency or time span.

NOTE

The OA option in the ST command behaves in the same manner as the ST? command in that it returns the current value to the controller. However, the OA option does not set the active function to Sweep Time.

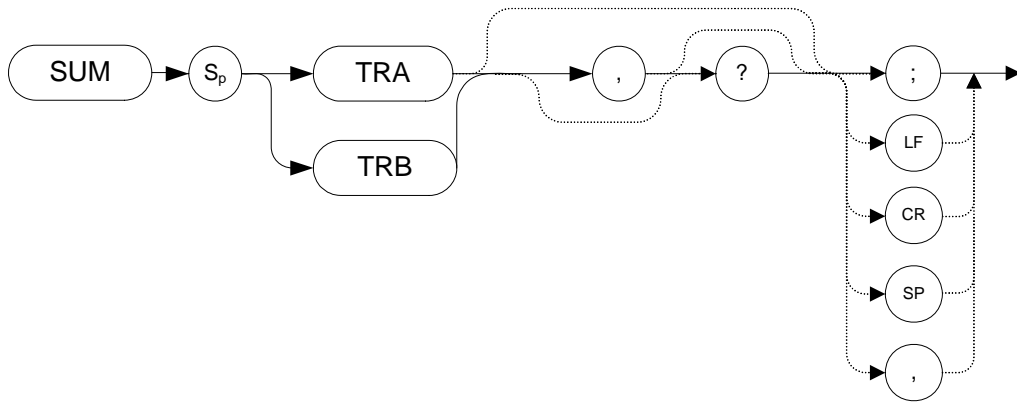
STB Status Byte Query

Syntax



Description

The STB command returns to the controller the decimal equivalent of the bits set in the status byte (see the RQS [\(page 187\)](#) and SRQ [\(page 196\)](#) commands). STB is equivalent to a serial poll.

SUM
Sum**Syntax****Description**

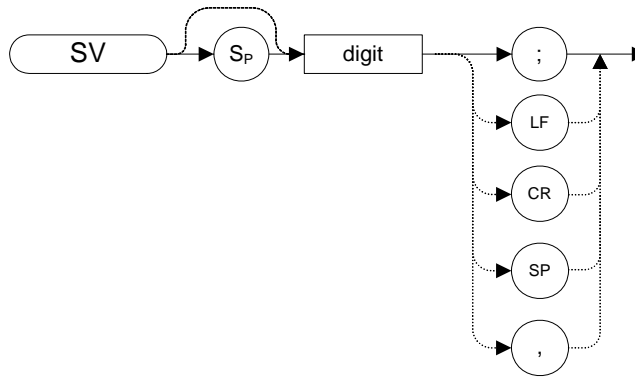
Returns the sum of all the trace values to the controller.

NOTE

Returns display units, range (0-610)*601 points or if Trace Data Format (TDF) is set to M, it returns ASCII.

SV Save State

Syntax



Description

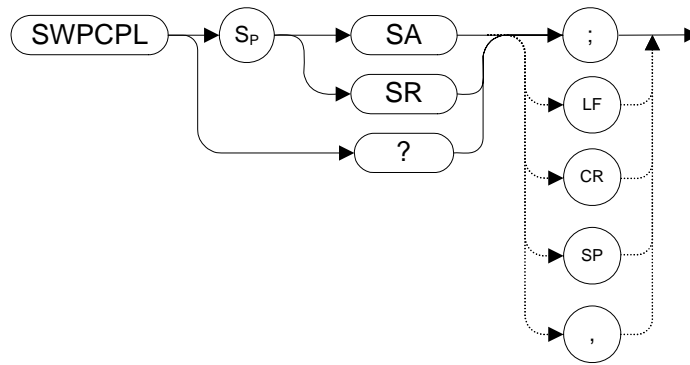
Saves the current state of the analyzer in any of the registers one through six.

NOTE

The functions of the SV command are identical to the SAVES command ([page 190](#)).

SWPCPL Sweep Couple

Syntax



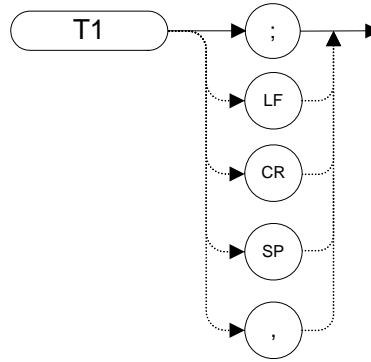
The preset value is SA.

Description

Selects either a stimulus-response (SR) or signal-analyzer (SA) auto-coupled sweep time. In stimulus response mode, auto-coupled sweep times are usually much faster for swept response measurements. Stimulus response auto-coupled sweep times are typically valid in stimulus-response measurements when the system frequency span is less than 20 times the bandwidth of the device under test.

T1 [one] Free Run Trigger

Syntax



Description

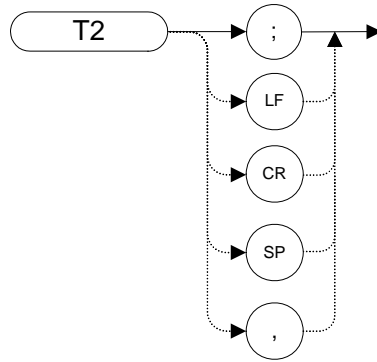
The T1 [one] command sets the analyzer sweep to free run trigger mode.

NOTE

The functions of the T1 [one] command are identical to the TM FREE command ([page 213](#)).

T2 [two] Line Trigger

Syntax



Description

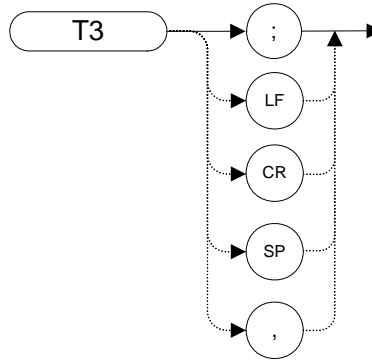
The T2 [two] command sets the analyzer sweep to line trigger mode.

NOTE

The functions of the T2 [two] command are identical to the TM LINE command ([page 213](#)).

T3 [three] External Trigger

Syntax



Description

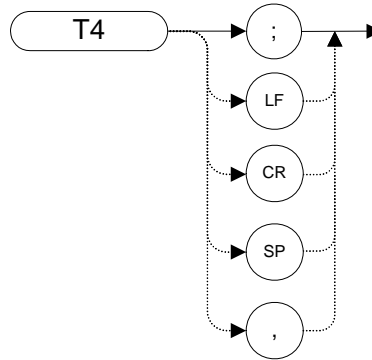
The T3 [three] command sets the analyzer sweep to external trigger mode.

NOTE

The functions of the T3 [three] command are identical to the TM EXT command ([page 213](#)).

T4 [four] Video Trigger

Syntax



Description

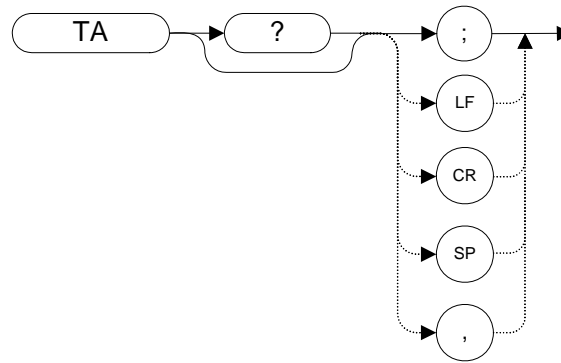
The T4 [four] command sets the analyzer sweep to video trigger mode.

NOTE

The functions of the T4 [four] command are identical to the TM VID command (page 213).

TA Trace A

Syntax



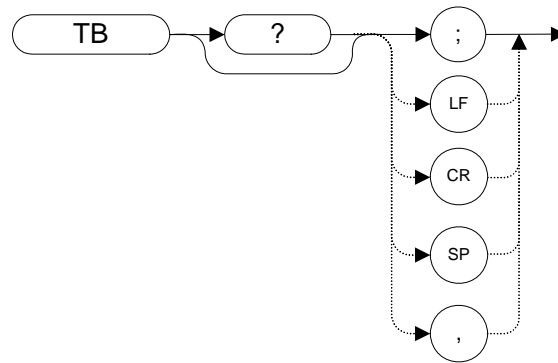
Description

Returns trace A amplitude values from the analyzer to the controller.

The display unit values are transferred in sequential order (from left to right) as seen on the screen. The format of the returned data is affected by the TDF (Trace Data Format) ([page 209](#)) command.

TB Trace B

Syntax



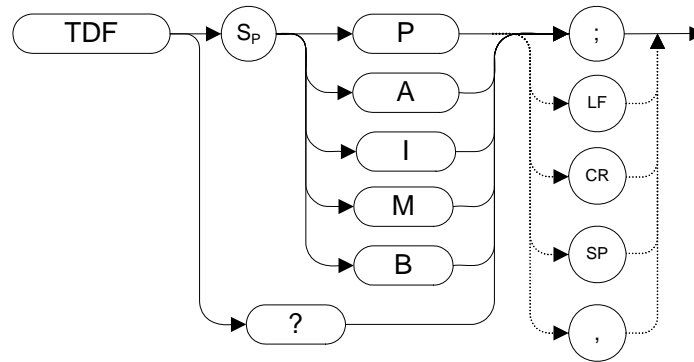
Description

Returns trace B amplitude values from the analyzer to the controller.

The display unit values are transferred in sequential order (from left to right) as seen on the screen. The format of the returned data is affected by the TDF (Trace Data Format) ([page 209](#)) command.

TDF Trace Data Format

Syntax



The preset value for TDF is P.

Description

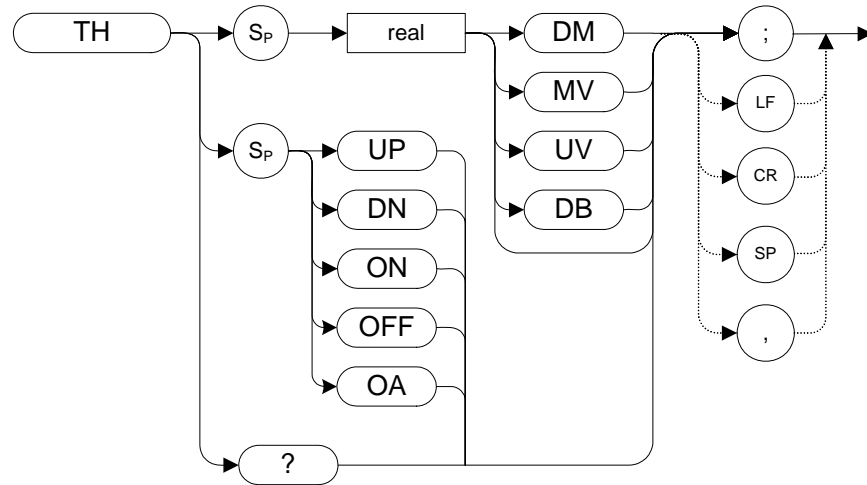
Formats trace information for return to the controller.

The different trace data formats are as follows:

- M selects the ASCII data format.
- P selects parameter data format. Numbers are in Hz, Volts, Watts, dBm, dBmV, DBuV, DBV.
- Specifying A returns data as an A-block data field.
- Specifying I returns data as an I-block data field.
- B selects binary data format.

TH Threshold

Syntax

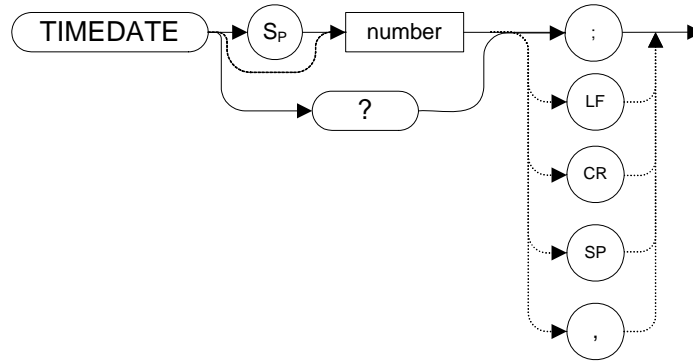


Description

The TH command blanks signal responses below the threshold level, similar to a base line clipper. The threshold level is nine major divisions below the reference level, unless otherwise specified. The UP and DN commands move the threshold 10 dB.

TIMEDATE Time Date

Syntax



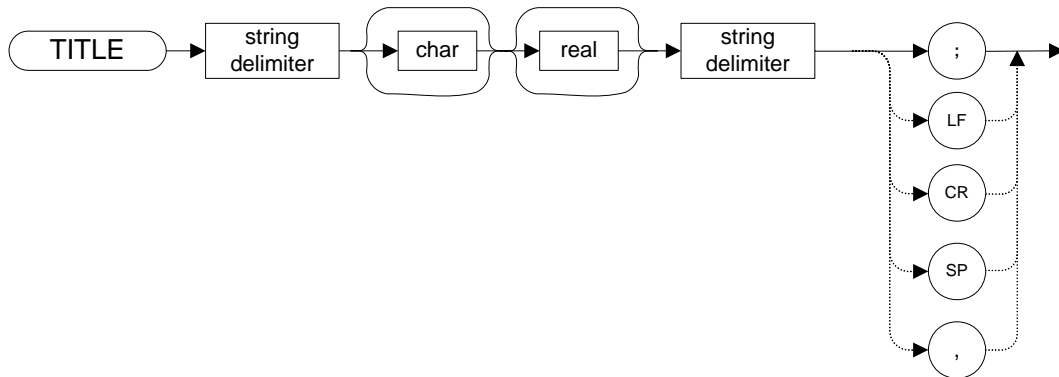
Description

Sets and returns the date and time of the real-time clock of the analyzer. The number takes the form YYMMDDHHMMSS (Year, Month, Day, Hour, Minute, Second).

TIMEDATE ON and TIMEDATE OFF commands are supported on some models of the 8560 series. This set of commands displays or hides the time and date in the graticule. The N9061A application on the X-series analyzers does not support these commands but accepts them and does not display a CMD ERR error or CMD NOT SUPPORTED error.

NOTE

This command changes the system clock of the instrument and may invalidate any time-based licenses installed on the instrument.

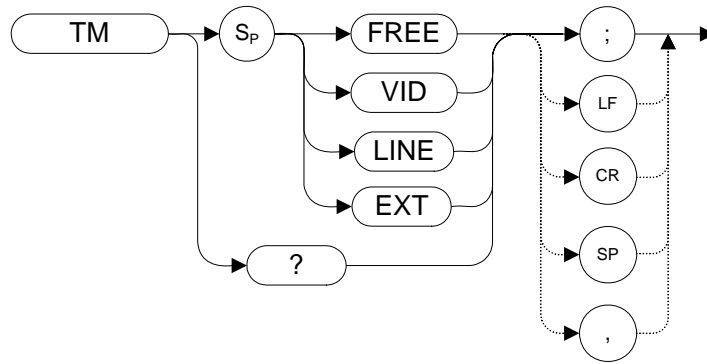
TITLE**Title****Syntax****Description**

The TITLE command activates the screen title mode, enabling you to enter your own title for the screen. Valid string delimiters which must be used to start and terminate the title are shown below.

- !
- “
- \$
- %
- &
- ‘
- /
- :
- =
- \
- ~
- @

TM Trigger Mode

Syntax



Description

Selects a trigger mode: free, line, video, or external.

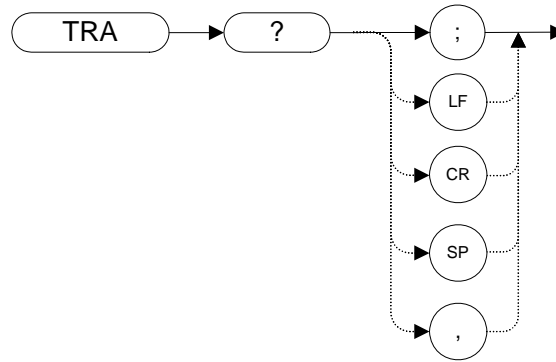
NOTE

The functions of the TM command are identical to the T1 ([page 203](#)), T2 ([page 204](#)), T3 ([page 205](#)) and T4 ([page 206](#)) commands.

TRA

Trace Data Input and Output

Syntax

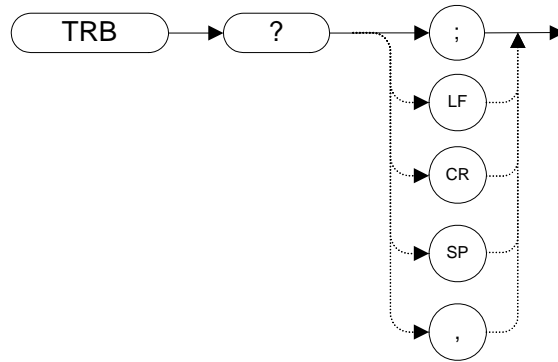


Description

The TRA command transfers Trace A amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command ([page 209](#)) for details on formatting.

TRB Trace Data Input and Output

Syntax

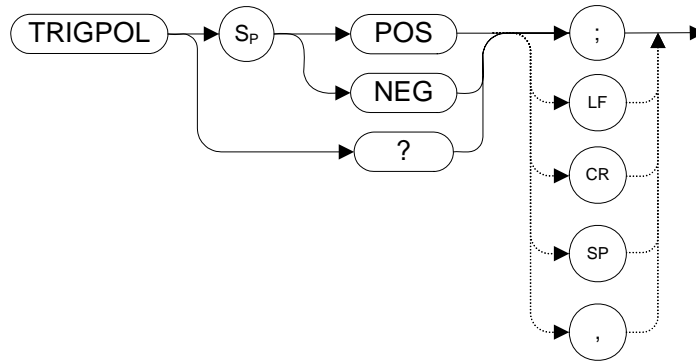


Description

The TRB command transfers Trace B amplitude values between the analyzer and the controller. The format depends on the trace data format selected. See [“TDF Trace Data Format” on page 209](#) for details on formatting.

TRIGPOL Trigger Polarity

Syntax

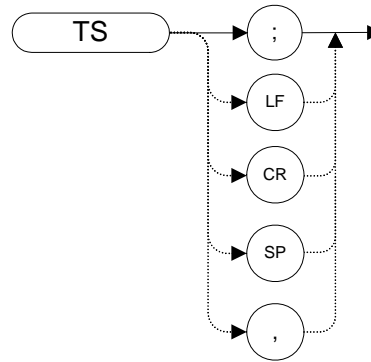


Description

Selects the edge (positive or negative) of the trigger input that causes the trigger event. TRIGPOL is available in all trigger modes.

TS Take Sweep

Syntax

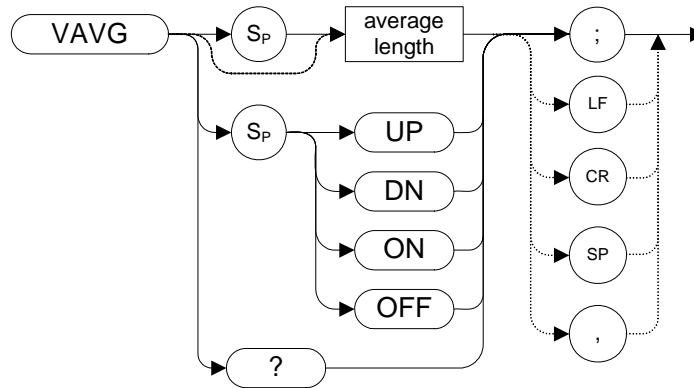


Description

Starts and completes one full sweep before the next command is executed. A TS command is required for each sweep in the single-sweep mode. TS always restarts a sweep even if a sweep is already in progress.

VAVG Video Average

Syntax



Description

Enables the video-averaging function, which averages trace points to smooth the displayed trace. When queried, the VAVG command returns the number of averages.

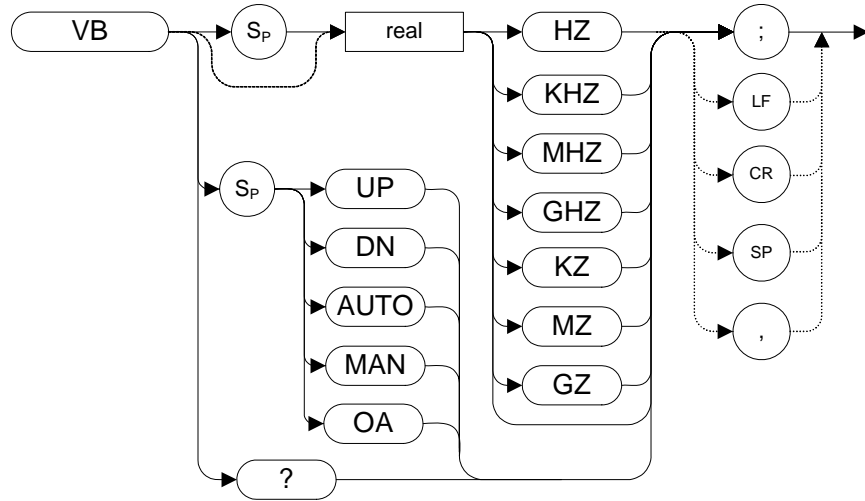
NOTE There are a few differences in the way video averaging works in the N9061A application compared to the legacy analyzers. See the following table for a summary of these differences.

Table 4-18 Legacy Analyzers - Video Averaging Behavioral Differences

| Condition | Legacy Spectrum Analyzers | N9061A application |
|-------------------------------------|--|--|
| Average Count value set to 0. | Cannot be set to 0. | Video averaging is turned off if the Averaging Count is set to 0. |
| Averaging turned on. | Sweep time remains unchanged. | Sweep time changes due to the selection of the sample detector. |
| Change in center frequency or span. | In single sweep mode, resets counter to zero and starts the averaging again. | In single sweep mode the X-Series analyzer uses all stored averages. Does not reset the counter after changes in RBW, VBW, Sweep Time, Ref. Level and Attenuation. |

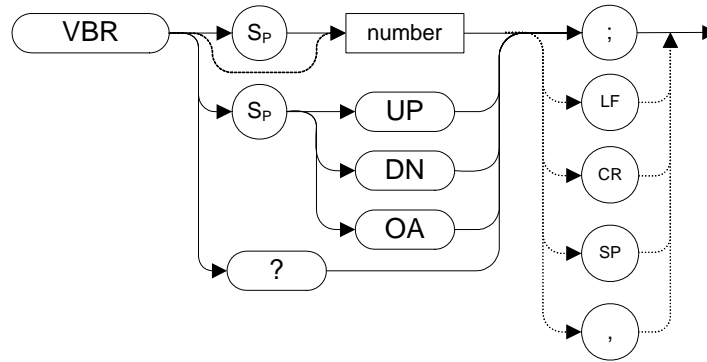
VB Video Bandwidth

Syntax



Description

Specifies the video bandwidth, which is a post-detection, low-pass filter.

VBR**Video Bandwidth to Resolution Bandwidth Ratio****Syntax****Description**

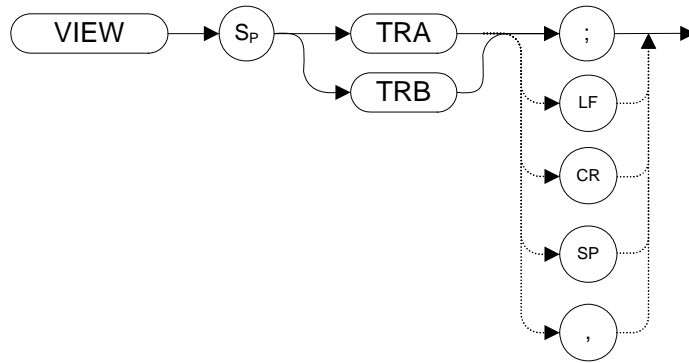
The VBR command specifies the relationship between the video and resolution bandwidths that is maintained when these bandwidths are coupled.

NOTE

VBR uses the legacy signal analyzer settings for video bandwidth only if **Mode Setup > Preferences > Limit RBW/VBW** is set to **ON**.

VIEW View Trace

Syntax



Description

Displays Trace A or Trace B and stops taking new data into the viewed trace.

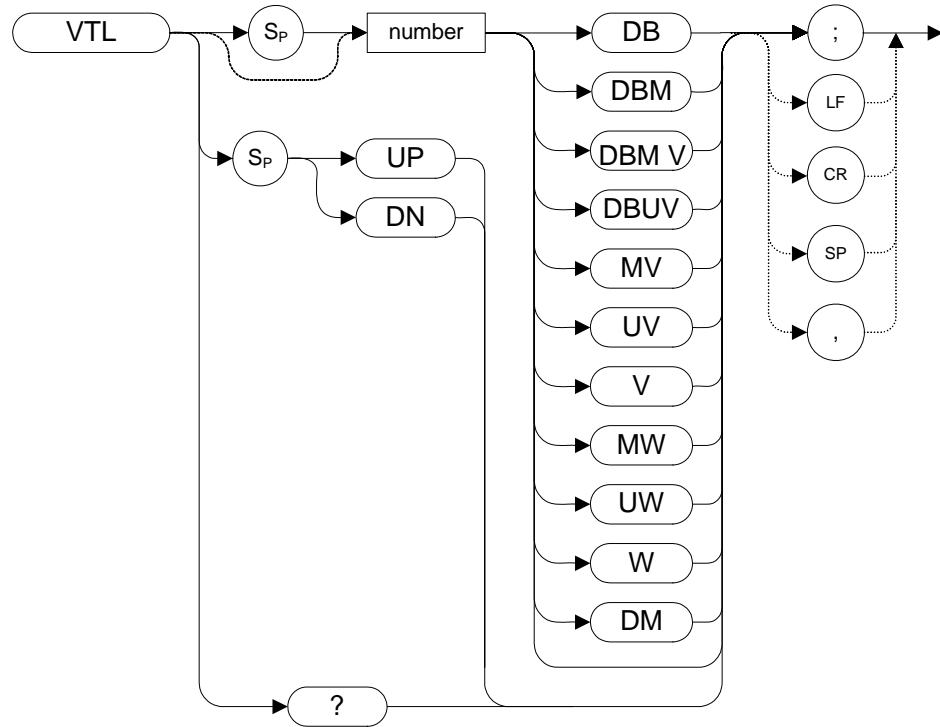
NOTE The functions of the VIEW command are identical to the A3 (page 53) and B3 (page 82) commands.

NOTE TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

For information on the settings of the X-series analyzers when legacy instrument trace settings are sent, see Table 4-4, “8560 series command mapping to X-series for trace/detector settings.”

VTL Video Trigger Level

Syntax



Description

The VTL command sets the signal level that triggers a sweep.

Note that setting a value for VTL sets the trigger mode to VIDEO, even if it was not already set to VIDEO. (See [“TM Trigger Mode” on page 213](#)).

5 **A Brief Introduction to the SCPI
Language**

SCPI Language Basics

This section is not intended to teach you everything about the SCPI (Standard Commands for Programmable Instruments) programming language. The SCPI Consortium or IEEE can provide that level of detailed information.

Topics covered in this chapter include:

- “Command Keywords and Syntax” on page 224
- “Creating Valid Commands” on page 224
- “Special Characters in Commands” on page 225
- “Parameters in Commands” on page 227
- “Putting Multiple Commands on the Same Line” on page 229

For more information refer to:

IEEE Standard 488.1-2004, *IEEE Standard Digital Interface for Programmable Instrumentation*. New York, NY, 1998.

IEEE Standard 488.2-2004, *IEEE Standard Codes, Formats, Protocols and Comment Commands for Use with ANSI/IEEE Std488.1-1987*. New York, NY, 1998.

Command Keywords and Syntax

A typical command is made up of keywords set off by colons. The keywords are followed by parameters that can be followed by optional units.

Example: `SENSE:FREQUENCY:START 1.5 MHZ`

The instrument does not distinguish between upper and lower case letters. In the documentation, upper case letters indicate the short form of the keyword. The lower case letters, indicate the long form of the keyword. Either form may be used in the command.

Example: `Sens:Freq:Star 1.5 mhz`

is the same as `SENSE:FREQ:start 1.5 MHz`

NOTE

The command `SENS:FREQU:STAR` is not valid because `FREQU` is neither the short, nor the long form of the command. Only the short and long forms of the keywords are allowed in valid commands.

Creating Valid Commands

Commands are not case sensitive and there are often many different ways of writing a particular command. These are examples of valid commands for a given

command syntax:

| Command Syntax | Sample Valid Commands |
|---|--|
| [SENSe:]BANDwidth[:RESolution] <freq> | <p>The following sample commands are all identical. They all cause the same result.</p> <ul style="list-style-type: none"> Sense:Band:Res 1700 BANDWIDTH:RESOLUTION 1.7e3 sens:band 1.7KHZ SENS:band 1.7E3Hz band 1.7kHz bandwidth:RES 1.7e3Hz |
| MEASure:SPECTrum[n]? | <ul style="list-style-type: none"> MEAS:SPEC? Meas:spec? meas:spec3? <p>The number 3 in the last meas example causes it to return different results than the commands above it. See the command description for more information.</p> |
| [:SENSe]:DETEctor[:FUNction] NEGative POSitive SAMPLE | <ul style="list-style-type: none"> DET:FUNC neg Detector:Func Pos |
| INITiate:CONTinuous ON OFF 1 0 | <p>The sample commands below are identical.</p> <ul style="list-style-type: none"> INIT:CONT ON init:continuous 1 |

Special Characters in Commands

| Special Character | Meaning | Example |
|-------------------|---|--|
| | A vertical stroke between parameters indicates alternative choices. The effect of the command is different depending on which parameter is selected. | <p>Command: TRIGger:SOURCE EXTErnal INTernAl LINE</p> <p>The choices are external, internal, and line. Ex: TRIG:SOURCE INT is one possible command choice.</p> |
| | A vertical stroke between keywords indicates identical effects exist for both keywords. The command functions the same for either keyword. Only one of these keywords is used at a time. | <p>Command: SENSE:bandwidth BWIDth: OFFSet</p> <p>Two identical commands are: Ex1: SENSE:BWIDth:OFFSet Ex2: SENSE:band:OFFSet</p> |

| Special Character | Meaning | Example |
|-------------------|---|--|
| [] | keywords in square brackets are optional when composing the command. These implied keywords are executed even if they are omitted. | <p>Command: [SENSe:]BANDwidth[:RESolu tion]:AUTO</p> <p>The following commands are all valid and have identical effects: Ex1: bandwidth:auto Ex2: band:resolution:auto Ex3: sense:bandwidth:auto</p> |
| < > | Angle brackets around a word, or words, indicates they are not to be used literally in the command. They represent the needed item. | <p>Command: SENS:FREQ <freq></p> <p>In this command example the word <freq> should be replaced by an actual frequency.</p> <p>Ex: SENS:FREQ 9.7MHz.</p> |
| { } | Parameters in braces can optionally be used in the command either not at all, once, or several times. | <p>Command: MEASure:BW <freq>{,level}</p> <p>A valid command is: meas:BW 6 MHz, 3 dB, 60 dB</p> |

Parameters in Commands

There are four basic types of parameters: booleans, keywords, variables and arbitrary block program data.

OFF|ON|0|1
(Boolean)

This is a two state boolean-type parameter. The numeric value 0 is equivalent to OFF. Any numeric value other than 0 is equivalent to ON. The numeric values of 0 or 1 are commonly used in the command instead of OFF or ON. Queries of the parameter always return a numeric value of 0 or 1.

keyword

The keywords that are allowed for a particular command are defined in the command syntax description.

Units

Numeric variables may include units. The valid units for a command depend on the variable type being used. See the following variable descriptions. The indicated default units are used if no units are sent. Units can follow the numerical value with, or without, a space.

Variable

A variable can be entered in exponential format as well as standard numeric format. The appropriate range of the variable and its optional units are defined in the command description.

The following keywords may also be used in commands, but not all commands allow keyword variables.

- DEFault - resets the parameter to its default value.
- UP - increments the parameter.
- DOWN - decrements the parameter.
- MINimum - sets the parameter to the smallest possible value.
- MAXimum - sets the parameter to the largest possible value.

The numeric value for the function's MINimum, MAXimum, or DEFault can be queried by adding the keyword to the command in its query form. The keyword must be entered following the question mark.

Example query: SENSE:FREQ:CENTER? MAX

Variable Parameters

| | |
|---------------|---|
| <integer> | is an integer value with no units. |
| <real> | Is a floating point number with no units. |
| <freq> | |
| <bandwidth> | Is a positive rational number followed by optional units. The default unit is Hertz. Acceptable units include: Hz, kHz, MHz, GHz. |
| <time> | |
| <seconds> | Is a rational number followed by optional units. The default units are seconds. Acceptable units include: ks, s, ms, us, ns. |
| <voltage> | Is a rational number followed by optional units. The default units are Volts. Acceptable units include: V, mV, μ V, nV |
| <current> | Is a rational number followed by optional units. The default units are Amperes. Acceptable units include: A, mA, μ A, nA. |
| <power> | Is a rational number followed by optional units. The default units are W. Acceptable units include: mAW, kW, W, mW, μ W, nW, pW. |
| <ampl> | Is a rational number followed by optional units. The default units are dBm. Acceptable units include: dBm, dBmV, dB μ V. |
| <rel_power> | |
| <rel_ampl> | Is a positive rational number followed by optional units. The default units are dB. Acceptable units include: dB. |
| <percent> | Is a rational number between 0 and 100. You can either use no units or use PCT. |
| <angle> | |
| <degrees> | Is a rational number followed by optional units. The default units are degrees. Acceptable units include: DEG, RAD. |
| <string> | Is a series of alpha numeric characters. |
| <bit_pattern> | Specifies a series of bits rather than a numeric value. The bit series is the binary representation of a numeric value. There are no units. |

Bit patterns are most often specified as hexadecimal numbers, though octal, binary or decimal numbers may also be used. In the SCPI language these numbers are specified as:

- Hexadecimal, #Hdddd or #hdddd where 'd' represents a hexadecimal digit 0 to 9 and 'a' to 'f'. So #h14 can be used instead of the decimal number 20.
- Octal, #Odddddd or #oddddd where 'd' represents an octal digit 0 to 7. So #o24 can be used instead of the decimal number 20.
- Binary, #Bdddddddddddddd or #bdddddddddddd where 'd' represents a 1 or 0. So #b10100 can be used instead of the decimal number 20.

Block Program Data

Some parameters consist of a block of data. There are a few standard types of block data. Arbitrary blocks of program data can also be used.

<trace> Is an array of rational numbers corresponding to displayed trace data. See FORMat:DATA for information about available data formats.

A SCPI command often refers to a block of current trace data with a variable name such as: Trace1, TRACE2, or trace3, depending on which trace is being accessed.

<arbitrary block data> Consists of a block of data bytes. The first information sent in the block is an ASCII header beginning with #. The block is terminated with a semi-colon. The header can be used to determine how many bytes are in the data block. There are no units. (You do not get block data if your data type is ASCII, using FORMat:DATA ASCII command. Your data is comma separated ASCII values.

Block data example: suppose the header is #512320.

- The first digit in the header (5) tells you how many additional digits/bytes there are in the header.
- The 12320 means 12 thousand, 3 hundred, 20 data bytes follow the header.
- Divide this number of bytes by your current data format (bytes/data point), either 8 (for real,64), or 4 (for real,32). For this example, if you're using real64 then there are 1540 points in the block.

Putting Multiple Commands on the Same Line

Multiple commands can be written on the same line, reducing your code space requirement. To do this:

- Commands must be separated with a semicolon (;).
- If the commands are in different subsystems, the key word for the new subsystem must be preceded by a colon (:).
- If the commands are in the same subsystem, the full hierarchy of the command key words need not be included. The second command can start at the same key word level as the command that was just executed.

SCPI Termination and Separator Syntax

All binary trace and response data is terminated with <NL><END>, as defined in Section 8.5 of IEEE Standard 488.2-1992, *IEEE Standard Codes, Formats, Protocols and Common Commands for Use with ANSI/IEEE Std 488.1-1987*. New York, NY, 1992. (Although one intent of SCPI is to be interface independent, <END> is only defined for IEEE 488 operation.)

The following are some examples of good and bad commands. The examples are created from a theoretical instrument with the simple set of commands indicated below:

```
[ :SENSe]
    :POWer
        [ :RF]
        :ATTenuation 40dB

:TRIGger
    [ :SEQuence]
    :EXTeRnal [1]
        :SLOPe
            POSitive

[ :SENSe]
    :FREQuency
        :STARt
    :POWer
    [ :RF]
        :MIXer
            :RANGe
            [ :UPPer]
```

| Bad Command | Good Command |
|---|--|
| PWR:ATT 40dB | POW:ATT 40dB |
| The short form of POWER is POW , not PWR . | |
| FREQ:STAR 30MHz;MIX:RANG -20dBm | FREQ:STAR 30MHz;POW:MIX:RANG -20dBm |
| The MIX:RANG command is in the same :SENSE subsystem as FREQ , but executing the FREQ command puts you back at the SENSE level. You must specify POW to get to the MIX:RANG command. | |
| FREQ:STAR 30MHz;POW:MIX RANG -20dBm | FREQ:STAR 30MHz;POW:MIX:RANG -20dBm |
| MIX and RANG require a colon to separate them. | |
| :POW:ATT 40dB;TRIG:FREQ:STAR 2.3GHz | :POW:ATT 40dB;:FREQ:STAR 2.3GHz |
| :FREQ:STAR is in the :SENSE subsystem, not the :TRIGGER subsystem. | |
| :POW:ATT?:FREQ:STAR? | :POW:ATT?;:FREQ:STAR? |
| :POW and FREQ are within the same :SENSE subsystem, but they are two separate commands, so they should be separated with a semicolon, not a colon. | |
| :POW:ATT -5dB;:FREQ:STAR 10MHz | :POW:ATT 5dB;:FREQ:STAR 10MHz |
| Attenuation cannot be a negative value. | |

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