Programming Conversion Guide

Agilent Technologies 8590/ESA Spectrum Analyzers

This guide provides documentation for the following instruments:

Agilent ESA-E Series

E4401B (9 kHz - 1.5 GHz)
E4402B (9 kHz - 3.0 GHz)
E4404B (9 kHz - 6.7 GHz)
E4405B (9 kHz - 13.2 GHz)
E4407B (9 kHz - 26.5 GHz)

and

ESA-L Series

E4411B (9 kHz - 1.5 GHz)
E4403B (9 kHz - 6.7 GHz)
E4408B (9 kHz - 26.5 GHz)

Manufacturing Part Number: E4401-90181
Supersedes Part Number: E4401-90094

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WARNING ***Warning*** **denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.**

CAUTION *Caution* denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

NOTE *Note* calls out special information for the user's attention. It provides operational information or additional instructions of which the user should be aware.

The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.

This symbol is used to mark the on position of the power line switch.

This symbol is used to mark the standby position of the power line switch.

This symbol indicates that the input power required is AC.

WARNING **This is a Safety Class 1 Product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protected earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.**

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Agilent 8590/ESA Spectrum Analyzers Conversion Guide

About this Guide

The purpose of this document is to help programmers convert HP/Agilent 8590-Series analyzer code into SCPI code that applies to the Agilent ESA spectrum analyzers.

The table in the main part of this guide consists of three columns (see the next several pages). Column 1 contains the HP/Agilent 8590-Series commands that may be present in your program. Column 2 is the corresponding SCPI command, and column 3 describes the function of the command, along with helpful comments.

The Appendix contains a table that lists alternate commands used by the HP/Agilent 8566A/B, HP/Agilent 8568A/B, and HP/Agilent 70000 Series analyzers and the associated HP/Agilent 8590-Series command.

NOTE

Information in the description/comments column is “aligned” horizontally with the command(s) to which it applies.

There may be more than one SCPI command that applies to any given HP/Agilent 8590-Series analyzer command. In these cases, the SCPI commands are listed one after the other in column 2 of the table. The next HP/Agilent 8590-Series command appears on the line following the previous (unrelated) SCPI command.

For example, for the HP/Agilent 8590-Series command AMPCOR, there is no similar SCPI command, and the description of AMPCOR is given in column 3. AMPCOR (data) has an associated SCPI command in column 2, with comments about the SCPI command in column 3. AMPCOR OFF/ON has two SCPI commands that are related, and no comments are given for those commands. The query AMPCOR? has a corresponding SCPI command in column 2, and associated comments in column 3 for the SCPI command.

Where to Find the Latest Information

Documentation is updated periodically. For the latest information about Agilent ESA Spectrum Analyzers, including firmware upgrades and application information, please visit the following Internet URL:

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

SCPI Output Format

SCPI Output Format

The Agilent ESA analyzers return data in NR3 format as described in IEEE Std 488.2-1992. Response terminators may be different than HP/Agilent 8590-Series analyzer terminators. For example, note the following differences:

- non-block response termination in the HP/Agilent 8590-Series analyzers is <CR><LF>, but in the Agilent ESA analyzers it is <LF><-EOI>
- boolean queries in HP/Agilent 8590-Series analyzers return ON or OFF, whereas boolean queries in Agilent ESA analyzers return 1 or 0
- OA and EP are valid parameters for many HP/Agilent 8590-Series spectrum analyzer commands, but are not valid for Agilent ESA spectrum analyzer commands

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ABORT		Stops the execution of all user-defined functions and readies the instrument for the next command received.
ABS		Places the absolute value of the source values in the destination.
ACP		Performs the adjacent channel power measurement.
ACPBW ACPBW?		Allows you to specify the channel bandwidth used for the adjacent channel power (ACP), extended adjacent channel power (ACPE), and channel power (CHP) measurements.
ACPCONTM		Changes the spectrum analyzer sweep mode to continuous sweep, and then performs the previous power measurement (occupied bandwidth, adjacent channel, or channel power) at the end of every sweep.
ACPE		Performs the adjacent channel power extended measurement.
ACPGR		Determines if the adjacent channel power (ACP) graph function is enabled or disabled.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ACPGRAPH		Computes and displays an adjacent channel power (ACP) graph.
ACPMK		Determines if the graph marker function is enabled or disabled for the adjacent channel power (ACP) graph.
ACPPAR		Determines if the spectrum analyzer settings used for the adjacent channel power (ACP), extended adjacent channel power (ACPE), channel power (CHP), or occupied bandwidth (OBW) measurement are set manually or automatically.
ACPSNGLM		Changes the spectrum analyzer sweep mode to single sweep, performs a take sweep (TS), and then performs the previous power measurement.
ACPSP		Allows you to specify the frequency spacing between channels.
ACTDEF		Creates a user-defined active function.
ACTVF		Returns a "0" if the given function is not active, a "1" if it is active.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ADD	:TRACe:MATH:ADD <destination_trace>,<source_trace1>, <source_trace2>	Adds the sources and sends the sum to the destination. Performs the math expression and places the result in the destination trace. Destination traces are: TRACE[1|2|3] Expressions consist of: (<operand><operator><operand>) Operands are: TRACE[1|2|3] Operators are: + for addition, – for subtraction
AMB		Subtracts trace B from trace A and sends the result to trace A during every sweep of the spectrum analyzer.
AMBPL		Subtracts trace B from trace A, adds the display line value to the difference, and sends the result to trace A during every sweep of the spectrum analyzer.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
AMPCOR		Applies amplitude correction at specified frequencies.
AMPCOR (data)	[SENSE:]CORRection:CSET[1]|2|3|4:DATA <freq>, <rel_ampl>{,<freq>, <rel_ampl>}	Units and spaces are not allowed in SCPI. The separator must be a comma (,) and the terminator must be a semicolon (;). Frequency and amplitude values must be entered in Hz and dB.
AMPCOR OFF/ON	[:SENSe]:CORRection:CSET:ALL[:STATe] OFF|ON|0|1 [:SENSe]:CORRection:CSET[1]|2|3|4[:STATe] OFF|ON|0|1	
AMPCOR?	[:SENSe]:CORRection:CSET[1]|2|3|4:DATA?	The data format for the command and query is always TDF P. The HP/Agilent 8590-Series analyzer returns data in the format: -57.71, -58.12, -56.87. The Agilent ESA analyzer returns data in the format: -5.46380000E+001, -5.44410000E+001, -5.47590000E+001. This is an example of IEEE NR3 numeric response data.
AMPLEN		Returns the number of frequency-amplitude correction factors that have been entered.
ANLGPLUS		Turns the Analog+ display mode on or off.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ANNOT		Turns the screen annotation on or off.
ANNOT ON|OFF	:DISPlay:WINDow:ANNotation[:ALL] OFF|ON|0|1	
ANNOT?	:DISPlay:WINDow:ANNotation[:ALL]?	The HP/Agilent 8590-Series analyzer returns ON or OFF. The Agilent ESA analyzer returns 1 or 0.
APB		Adds trace A to trace B and sends the result to trace A.
	:TRACe:MATH:ADD <destination_trace>, <source_trace1>, <source_trace2>	Adds TRACE1 (trace A) to TRACE2 (trace B) and sends the result to TRACE1 (trace A).
AT		Specifies RF input attenuation.
AT <numeric_ value>	[:SENSe]:POWer[:RF]:ATTenuation <rel_ampl>	The up/down steps are in 5 dB increments.
AT AUTO	[:SENSe]:POWer[:RF]:ATTenuation:AUTO ON|1	The up/down steps are in 5 dB increments.
AT UP|DN		
AT?	[:SENSe]:POWer[:RF]:ATTenuation?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
AUNITS AUNITS?	 :UNIT:POWer DBM|DBMV|DBUV|V|W :UNIT:POWer?	Specifies amplitude units for input, output, and display. Specifies amplitude units for the input, output, and display for the active window.
AUTO AUTO	 :COUPle ALL|NONE	Couples the active functions automatically. The instrument can automatically couple instrument settings together for accurate measurements and optimum range. This command is used to override the coupling for special measurement needs. The NONE parameter applies only to the SCPI language.
AVG		Averages trace data.
AXB	 :TRACe:EXCHange TRACE1, TRACE2	Exchanges trace A and trace B. Exchanges TRACE1 (trace A) and TRACE2 (trace B), point by point.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
BAUDRATE		Specifies the baud rate of a spectrum analyzer with the RS-232 interface option (Option 1AX) installed.
	:SYSTem:COMMunicate:SERial[1]|2|3|4|5|6|7|8 [:RECeive]:BAUD <baud_rate>	Specifies the baud rate of the instrument, with the RS-232 interface installed. If no optional serial port number is specified, port 1 is assumed. The transmit baud rate is set to the same value as the receive baud rate.
BAUDRATE?	:SYSTem:COMMunicate:SERial[1]|2|3|4|5|6|7|8 [:RECeive]:BAUD?	The HP/Agilent 8590-Series analyzers return data in the format: 1200. The Agilent ESA analyzers return data in the format: +1200.
BIT		Returns the state of a bit.
BITF		Returns the state of a bit.
BLANK		Blanks trace A, trace B, or trace C and stops taking new data into the specified trace.
BLANK TRA BLANK TRB BLANK TRC	:TRACe[1]|2|3:MODE BLANk	Selects the blank display mode for the selected trace. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C. The blank display mode turns off the trace data so that it is not viewed on the display.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
BML	:TRACe:MATH:SUBTract:DLINe <trace>	Subtracts display line from trace B and places the result in trace B. Subtracts DLINe (display line) from TRACE2 (trace B) and places the result into TRACE2 (trace B).
BTC	:TRACe:COPY TRACE2, TRACE3	Transfers trace B into trace C. Transfers TRACE2 (trace B) into TRACE3 (trace C).
BXC	:TRACe:EXCHange TRACE2, TRACE3	Exchanges trace B and trace C. Exchanges TRACE2 (trace B) with TRACE3 (trace C), point by point.
CAL CAL ALL CAL AMP CAL ON/OFF CAL TG CAL YTF CAL INIT CAL FREQ	 :CALibration:[ALL] :CALibration:AUTO:MODE ALL | NRF :CALibration:AUTO[:STATe] OFF | ON | 0 | 1 :CALibration:TG :CALibration:RF :CALibration:DATA:DEFault :CALibration:FREQuency[:STATe] OFF | ON | 0 | 1	Initiates self-calibration routines.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
CAT	:MMEMory:CATalog? <drive>	Displays/returns directory information from either the specified or the current mass storage device. List all files in the current directory. <msus> is the mass storage device. The return data will be of the format: <mem_used>,<mem_free> {<file_listing>} Each <file listing> indicates the name, type, and size of one file in the directory list: <file_name>,<file_type>,<file_size>
CF CF <value> CF UP|DN CF?	[:SENSe]:FREQuency:CENTer <freq> [:SENSe]:FREQuency:CENTer?	Specifies center frequency. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.
CHP		Performs the channel power measurement.
CHPGR		Determines if the channel power graph function is enabled or disabled.
CLRAVG	[:SENSe]:AVERage:CLEar	Restarts video averaging. Re-start the trace averaging function.
CLRBOX		Clears a rectangular area on the spectrum analyzer display.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
CLRDSP		Erases user-generated graphics and text.
CLRW CLRW TRA CLRW TRB CLRW TRC	 :TRACe[1 | 2 | 3]:MODE WRITe	Clears the specified trace and enables trace data acquisition. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C.
CLS 	 *CLS	Clears all status bits. The status bits do not map exactly.
CMDERRQ		Allows query of error queue.
CNF		
CNTLA		Sets the control line A of the auxiliary interface high or low. Agilent ESA spectrum analyzers do not have an auxiliary interface.
CNTLB		Sets the control line B of the auxiliary interface high or low. Agilent ESA spectrum analyzers do not have an auxiliary interface.
CNTLC		Sets the interface control line C of the auxiliary interface high or low. Agilent ESA spectrum analyzers do not have an auxiliary interface.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
CNTLD		Sets the interface control line D of the auxiliary interface high or low. Agilent ESA spectrum analyzers do not have an auxiliary interface.
CNTLI		Returns a "1" when the interface control line I of the auxiliary interface is high, and "0" if the line is low. Agilent ESA spectrum analyzers do not have an auxiliary interface.
COMB		Turns the comb generator on or off. This hardware is not present in Agilent ESA spectrum analyzers.
COMPRESS		Reduces the number of trace elements while retaining the relative frequency and amplitude characteristics of the trace data.
CONCAT		Combines two traces.
CONTS	:INITiate:CONTinuous ON | 1	Sets the spectrum analyzer to the continuous sweep mode.
CORREK	:CALibration:FREQuency[:STATe]?	Query the instrument for the state of corrections.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
COUPLE		Selects direct-current (dc) coupling or alternating-current (ac) coupling
COUPLE AC|DC	:INPut:COUPling AC|DC	Selects ac or dc coupling for the front panel RF INPUT port. A blocking capacitor is switched in for the ac mode. This command applies only to the following products: Agilent E4404B Agilent E4405B
COUPLE?	:INPut:COUPling?	The output is: AC or DC.
CRTHPOS		Specifies the horizontal position of the text and graticule on the spectrum analyzer display.
CRTVPOS		Specifies the vertical position of the text and graticule on the spectrum analyzer display.
CTA		Converts the source values from measurement units to the current absolute amplitude units and stores the result in the destination.
CTM		Converts the source values to measurement units and places the result in the destination.
DA		Accesses the current address of the display list.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
DATEMODE		Allows you to set the format for displaying the real-time clock.
	:DISPlay:ANNotation:CLOCk:DATE:FORMat MDY|DMY	Allows you to set the format for displaying the real-time clock. To set the date and time use the command :SYSTem:DATE <year>,<month>,<day>.
DATEMODE?	:DISPlay:ANNotation:CLOCk:DATE:FORMat?	The response output is in the form: MDY or DMY.
DEMOD		Turns the demodulator on or off, and selects between AM, FM, or quasi-peak demodulation.
DEMOD AM|FM	[:SENSe]:DEMod AM|FM	Sets the type of demodulation.
DEMOD ON|OFF	[:SENSe]:DEMod:STATe OFF|ON|0|1	Turns demodulation on or off.
	[:SENSe]:DEMod:VIEW[:STATe] OFF|ON|0|1	Turns Demod View on or off. Demod View must be turned on in order to activate the demodulation waveform.
DEMOD?	[:SENSe]:DEMod:STATe?	The HP/Agilent 8590-Series analyzer returns AM, FM or OFF. The Agilent ESA analyzer returns 1 (corresponding to the HP/Agilent 8590-Series response AM or FM), or 0 (corresponding to OFF).
	[:SENSe]:DEMod:VIEW[:STATe]?	This query returns the state of Demod View. Demod View must be turned on in order to activate the demodulation waveform.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
DET		Selects the spectrum analyzer detection mode.
		Specifies the detection mode.
DET NEG DET POS DET SMP	[:SENSe]:DETector[:FUNCtion] NEGative | POSitive | SAMPle	Negative peak detection displays the lowest sample taken during the interval being displayed. Positive peak detection displays the highest sample taken during the interval being displayed. Sample detection displays the first sample taken during the interval being displayed.
DET?	[:SENSe]:DETector[:FUNCtion]?	The HP/Agilent 8590-Series analyzer returns NEG, POS, or SMP. The Agilent ESA analyzer returns NEG, POS, or SAMP.
DISPOSE		Deletes user-defined functions and frees spectrum analyzer memory that was previously allocated for user-defined operands. The HP/Agilent 8590-Series analyzer returns NEG or POS. The Agilent ESA analyzer returns 1 or 0.
DIV		Divides source 1 by source 2 and places the result in the destination.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
DL		Defines the level of the display line in the active amplitude units and displays the display line on the spectrum analyzer screen.
DL <value>	:DISPlay:WINDow:TRACe:Y:DLINe <ampl>	Defines the level of the display line in the active amplitude units, if no units are specified.
DL ON|OFF	:DISPlay:WINDow:TRACe:Y:DLINe:STATe OFF|ON|0|1	Turns the display line on or off.
DL UP|DN		
DL?	:DISPlay:WINDow:TRACe:Y:DLINe:STATe?	The HP/Agilent 8590-Series analyzer outputs data in the format: -25.00. The Agilent ESA analyzer outputs data in the format: -2.50000000E+001.
DN		Reduces the active function by the applicable step size. Each HP/Agilent 8590-Series command to which DN can be applied will have <step> = DOWN|UP as a parameter in the SCPI command. DN (as well as UP) can only be sent as a parameter in SCPI.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
DONE		Allows you to determine when the spectrum analyzer has started to execute all commands prior to and including DONE.
	*OPC	
DONE?	*OPC?	The HP/Agilent 8590-Series analyzer outputs data in the format: 1. The Agilent ESA analyzer outputs data in the format: +1.
DOTDENS		Sets the dot density value in the Analog+ display mode.
DRAWBOX		Draws a rectangular box on the spectrum analyzer display.
DSPLY		Displays the value of a variable on the spectrum analyzer screen.
DT		Defines any character as a label terminator.
EE		Enables front-panel number entry. Sends the controller the values entered on the spectrum analyzer numeric keypad by the operator.
EK		Allows data entry with the front-panel knob when the spectrum analyzer is under remote control.
ENTER		Allows the spectrum analyzer to receive data from other devices on the GPIB.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
EP		Enter parameter from front panel. Sends values entered on the spectrum analyzer number keyboard to the present active function value.
ERASE		Clears trace A and trace B, disposes of the contents of the user memory, and resets the state registers and the spectrum analyzer to the instrument preset state.
EXP		Places the exponential of the source in the destination.
FA FA <value> FA UP | DN FA?	 [:SENSe]:FREQuency:STARt <freq> [:SENSe]:FREQuency:STARt?	Specifies the start frequency. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
FB FA <value> FA UP|DN	[:SENSe]:FREQuency:STOP <freq>	Specifies the stop frequency.
FB?	[:SENSe]:FREQuency:STOP?	The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.
FFT		Performs a discrete fast Fourier transform on the source trace array and stores the result in the destination array.
FFTAUTO		Performs a fast Fourier transform (FFT) on the signal on which the marker is placed.
FFTCLIP		Indicates if the FFT results are valid.
FFTCONTS		Performs a fast Fourier transform(FFT) continuously on the current signal.
FFTMKR		Activates the FFT markers and displays the FFT annotation on the spectrum analyzer display.
FFTMM		Changes the FFT mid-display frequency of the spectrum analyzer to the frequency of the FFT marker.
FFTMS		Changes the FFT stop frequency of the spectrum analyzer to the frequency of the FFT marker.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
FFTOFF		Exits the fast Fourier transform (FFT) measurement and FFT settings.
FFTPCTAM		Turns the percent AM function on or off. during an FFT measurement.
FFTPCTAMR		Returns the percent of amplitude modulation(AM).
FFTSNGLS		Changes the spectrum analyzer sweep mode to single sweep mode (if necessary), and then performs a fast Fourier transform (FFT) on trace A.
FFTSTAT		Returns the status of the spectrum analyzer FFT measurement functions.
FFTSTOP		Sets the FFT stop frequency of the FFT measurement.
FMGAIN FMGAIN <value> FMGAIN UP|DN FMGAIN?	 [:SENSe]:DEMod:FMDeviation <freq> [:SENSe]:DEMod:FMDeviation?	Sets the total FM deviation for full screen demodulation. The HP/Agilent 8590-Series analyzer outputs data in the format: 10. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
FOFFSET	:DISPlay:WINDow:TRACe:X[:SCALe]:OFFSet <freq>	Specifies the frequency offset for all absolute frequency readouts such as center frequency.
FOFFSET?	:DISPlay:WINDow:TRACe:X[:SCALe]:OFFSet?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.
FORMAT		Formats the memory card.
FS	[:SENSe]:FREQuency:SPAN:FULL	Sets the frequency span of the spectrum analyzer to full span. Sets the frequency span to full span.
FUNCDEF		Defines a routine consisting of spectrum analyzer commands, assigns the routine a label, and stores the routine and its label in the user memory.
GATE GATE ON|OFF	[:SENSe]:SWEep:TIME:GATE[:STATe] OFF|ON|0|1	Turns time gating on or off.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
GATECTL		Selects between the edge and the level mode for Option 105, the time-gated spectrum analysis capability.
GATECTL EDGE|LEVEL	[:SENSe]:SWEep:TIME:GATE:TYPE LEVel|EDGE	Selects between the edge and the level mode for Option 1D6, the time-gated spectrum analysis capability. Level triggers the gate when the signal surpasses a specific level, set to either low or high. Edge triggers the gate when the edge of a signal is encountered, set to either a negative-going edge or a positive-going edge.
GATECTL?	[:SENSe]:SWEep:TIME:GATE:TYPE?	The HP/Agilent 8590-Series analyzer returns EDGE or LEVEL. The Agilent ESA analyzer returns EDGE or LEV.
GC		Presets Option 105, the time-gated spectrum analysis capability.
	[:SENSe]:SWEep:TIME:GATE:PRESet	Presets Option 1D6, the time-gated spectrum analysis capability.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
GD		Sets the delay time before the gate opens.
GD <value>	[:SENSe]:SWEep:TIME:GATE:DELay <time>	Sets the delay time from when the gate trigger occurs to when the gate opens. This is for EDGE triggering only.
GD UP|DN		
GD?	[:SENSe]:SWEep:TIME:GATE:DELay?	The HP/Agilent 8590-Series analyzer outputs data in the format: 1E-6. The Agilent ESA analyzer outputs data in the format: +1.00000000E-006.
GDRVCLPAR		Clears the pulse parameters (pulse width, pulse repetition interval, and reference edge) for a time-gate measurement by setting the pulse parameters to 0.
GDRVGDEL		For the frequency window only, GDRVGDEL sets the time delay from when the gate trigger occurs to when the gate is opened.
GDRVGLEN		Adjusts the gate length in both the time and frequency windows.
GDRVGT		Turns the gate on or off in the frequency window.
GDRVGTIM		Activates the gate trigger marker, and places it at the given value.
GDRVPRI		Enters the specified value as the pulse repetition interval.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
GDRVPWID		Enters the specified value as the pulse width. Specifies the gate time length in seconds. For EDGE triggering only.
GDRVRBW		Couples or uncouples the resolution bandwidth to the specified pulse width.
GDRVREFE		Allows you to enter the position (in time) for a reference edge.
GDRVST		Couples or uncouples the sweep time to the pulse repetition interval.
GDRVSWAP		Makes the window (either the time or frequency window) that is currently not the active window, the active window.
GDRVSWDE		Allows you to specify the delay from the edge of the gate trigger until the sweep is started in the time window.
GDRVSWP		Specifies the sweep time for the time domain window of the gate utility.
GDRVUTIL		Turns the gate utility on or off.
GDRVVBW		Couples or uncouples the video bandwidth to the gate length.
GETPLOT		Initiates output of the spectrum analyzer display to a plotter.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
GETPRNT	:HCOPy[:IMMediate]	Initiates output of the spectrum analyzer display to a printer.
GL GL <value> GL UP|DN GL?	[:SENSe]:SWEep:TIME:GATE:LENGth <time> [:SENSe]:SWEep:TIME:GATE:LENGth?	Sets the length of time the gate is open. Output formats are different.
GP GP POS|NEG GP?	[:SENSe]:SWEep:TIME:GATE:POLarity NEGative|POSitive [:SENSe]:SWEep:TIME:GATE:POLarity?	Sets the polarity (positive or negative) for the gate trigger. Returns POS or NEG.
GR		Graphs the given y coordinate while incrementing the x coordinate by 1.
GRAT GRAT ON|OFF GRAT?	:DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe] OFF|ON|0|1 :DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe]?	Turns the graticule on or off. The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent ESA analyzer outputs 1 or 0.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
HAVE		Used by menus for testing for hardware configuration.
HD		Disables data entry via the spectrum analyzer numeric keypad, knob, or step keys. The active function readout is blanked, and any active function is deactivated.
HN		Returns the harmonic number of the current harmonic band in which the spectrum analyzer is tuning.
HNLOCK		Forces the spectrum analyzer to use only the selected harmonic band.
HNUNLK		Unlocks the harmonic band.
IB		Provides a method for putting values into trace B.
ID ID?	*IDN?	Returns the spectrum analyzer model number. The HP/Agilent 8590-Series analyzer returns the model number in the format: HP/Agilent 8592L. The Agilent ESA analyzer returns the format: Agilent E4411B.
IF etc		IF/THEN/ELSE/ENDIF forms a decision and branching construct.
INT		Places the greatest integer that is less than or equal to the source value into the destination.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
INZ		Specifies the value of input impedance expected at the active input port.
INZ 75|50	[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude] <number>	Amplitude correction is applied to the display data to adjust for the measurement situations where the Unit Under Test has a different impedance than the instrument 50 Ohm input impedance.
INZ?	[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude]?	The HP/Agilent 8590-Series analyzer outputs data in the format: 50. The Agilent ESA analyzer outputs data in the format: +50.
IP	:SYSTem:PRESet	Performs an instrument preset.
KEYCLR		Clears softkeys 1 through 6.
KEYCMD		Allows you to define the function and label of a softkey. The softkey label is updated whenever a softkey is pressed.
KEYDEF		Assigns a label and user-defined function to a softkey.
KEYENH		Allows you to activate inverse video mode or underline part or all of the softkey label.
KEYEXC		Executes the specified, previously defined softkey.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
KEYLBL		Relabels a softkey without changing its function.
LB		Writes text at the current pen position.
LF		Performs an instrument preset to the baseband (band 0).
LG LG <value> LG UP|DN LG?	 :DISPlay:WINDow:TRACe:Y[:SCALe]:SPACing LOGarithmic :DISPlay:WINDow:TRACe:Y[:SCALe]:PDIVision <rel_ampl> :DISPlay:WINDow:TRACe:Y[:SCALe]:PDIVision? :DISPlay:WINDow:TRACe:Y[:SCALe]:SPACing?	Specifies the vertical graticule divisions as logarithmic units, without changing the reference level. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.
LIMIDEL	:CALCulate:LLINe[1]|2:DELete	Deletes all segments in the current limit-line table.
LIMIDISP	:CALCulate:LLINe[1]|2:DISPlay OFF|ON|0|1	Controls when the limit line (or limit lines) are displayed.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
LIMIFAIL	:CALCulate:LLINe[1]|2:FAIL?	Returns a "0" if the last measurement sweep of trace A is equal to or within the limit-line bounds.
LIMIFT	:CALCulate:LLINe:CONTrol:DOMain FREQuency|TIME	Selects how the limit-line segments are placed on the spectrum analyzer display, according to frequency, or according to the sweep time setting of the spectrum analyzer.
LIMIHALF	<no equivalent SCPI command>	Edit/specify upper or lower limit line only. There is no similar function in Agilent ESA analyzers.
LIMIHI	<no equivalent SCPI command>	Allows you to specify a fixed trace as the upper limit line. There is no similar function in Agilent ESA analyzers.
LIMILINE	:CALCulate:LLINe[1]|2:DATA? :CALCulate:LLINe[1]|2:MARGin? :CALCulate:LLINe[1]|2:MARGin:STATe?	Outputs the current limit-line table definitions.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
LIMILO	<no equivalent SCPI command>	Allows you to specify a fixed trace as the lower limit line. There is no similar function in Agilent ESA analyzers.
LIMIMIRROR	<no equivalent SCPI command>	Reflects the current definition about the amplitude axis at the largest frequency or the largest sweep time in the definition. There is no similar function in Agilent ESA analyzers.
LIMIMODE	:CALCulate:LLINe[1]|2:TYPE UPPer|LOWer	Determines whether the limit-line entries are treated as upper amplitude values, lower amplitude values, upper and lower amplitude values, or mid-amplitude and delta values.
LIMIREL	:CALCulate:LLINe:CMODe FIXed|RELative	Specifies the current limit lines as fixed or relative.
LIMISEG	:CALCulate:LLINe[1]|2:DATA:MERGe <x-axis>,<ampl>,<connected> {<x-axis>,<ampl>,<connected>}	Adds new segments to the current frequency limit line in either the upper limit line or the lower limit line. <x> is frequency in Hz. <ampl> is amplitude in dB. <connected>: 1 = connected, and 2 = not connected.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
LIMISEGT	:CALCulate:LLINe[1]|2:DATA:MERGe <x-axis>,<ampl>,<connected> {<x-axis>,<ampl>,<connected>}	Adds new segments to the current sweep time limit line in either the upper limit line or the lower limit line. <x> is frequency in Hz. <ampl> is amplitude in dB. <connected>: 1 = connected, and 2 = not connected.
LIMITEST	:CALCulate:LLINe[1]|2:STATe OFF|ON|0|1	Compares trace A with the current limit-line data.
LINFILL	:CALCulate:LLINe[1]|2:AMPLitude:INTerpolate: TYPE LOGarithmic|LINear	Fills linear interpolated data into the specified trace data points of a destination trace.
LN	:DISPlay:WINDow:TRACe:Y[:SCALe]:SPACing LINear	Specifies the vertical graticule divisions as linear units, without changing the reference level. Specifies the vertical graticule divisions as log or linear units.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
LOAD	 :MMEMory:LOAD:STATe <reg_number>,<file_name> :MMEMory:LOAD:TRACe TRACE1 | TRACE2 | TRACE3, <file_name>	For loading a trace, amplitude correction, limit, or state. For loading the analyzer state from a file. For loading a trace.
LOG		Takes the logarithm (base 10) of the source, multiplies the result by the scaling factor, then stores it in the destination.
LSPAN	 [:SENSe]:FREQuency:SPAN:PREVious	Changes the spectrum analyzer span to the previous span setting.
M4		Activates a single marker on the trace and enables the knob to change the position of the marker. The active function is then set to span.
MDS	 :FORMat: [:TRACe][:DATA] ASCii | INTeger,32 | REAL,32 | REAL,64	Specifies measurement data size as byte or word. Specifies the measurement data size in SCPI.
MDU		Returns values for the spectrum analyzer baseline and reference level.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MEAN MEAN TRA? MEAN TRB? MEAN TRC?	:TRACe:MATH:MEAN? <trace>	Returns the mean value of the given trace in measurement units. Returns the mean of the amplitudes of the trace amplitude elements in measurement units. The format of the response data will be different. Traces are: TRACE[1|2|3]. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C.
MEANTH		Returns the mean value of the given trace above the threshold, in measurement units.
MEASOFF		Turns off the current measurement, erases the display, and then displays the menu accessed by MEAS/USER.
MEASURE		Determines the type of measurement: signal analysis, stimulus response, or signal normalization.
MEM		Returns the amount of spectrum analyzer memory available.
MENU		Selects and displays the softkey menus on the spectrum analyzer screen.
MERGE		Merges the source trace into the specified area of the destination trace.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MF	:CALCulate:MARKer[1]|2|3|4:X?	Returns the frequency (or time) of the on-screen active marker.
MIN		Compares source 1 and 2, point by point, and stores the lesser of the two in the destination.
MINH	:TRACe[1]|2|3:MODE|MINHold	Updates trace C elements with minimum level detected. Selects the display mode for the selected trace. Minimum hold displays the lowest measured trace value for all the data that has been measured since the function was turned on.
MINPOS		Returns a value, which is the x-axis position (in display units) of the minimum amplitude value in trace A, trace B, trace C, or user-defined trace.
MIRROR		Displays the mirror image of a trace.
MKA MKA?	:CALCulate:MARKer[1]|2|3|4:Y?	Specifies amplitude of the active marker. Read the current Y value for the designated marker on the assigned trace. The value is in the y-axis units for the trace (dBm, volts, and so forth). The HP/Agilent 8590-Series analyzer outputs data in the format: -66.9. The Agilent ESA analyzer outputs data in the format: -6.69000000E+001.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKACT MKACT 1|2|3|4 MKACT?	 :CALCulate:MARKer[1]|2|3|4:STATe ON|1 <no SCPI equivalent>	Specifies the active marker. The HP/Agilent 8590-Series analyzer outputs data in the format: 1. The Agilent ESA analyzer outputs data in the format: +1.
MKACTV		Makes the current active marker the active function.
MKBW		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	 :CALCulate:MARKer[1]|2|3|4[:SET]:CENTer	Sets the center frequency equal to the marker frequency and moves the marker to the center of the screen. Sets the center frequency equal to the specified marker frequency, which moves the marker to the center of the screen.
MKCONT		Resumes the sweep after execution of a MKSTOP command.
MKD	 :CALCulate:MARKer[1]|2|3|4:MODE DELTa or, :CALCulate:MARKer[1]|2|3|4:X <param>	Activates the delta marker. Positions the designated marker on the assigned trace at the specified X value. The value is in the x axis units (which is often frequency or time).

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKDLMODE		Selects whether the marker amplitude values are shown as relative to the reference level (normal mode), or relative to the display line (delta mode) when the marker table is turned on.
MKF	:CALCulate:MARKer[1]|2|3|4:X <param>	Specifies the frequency value of the active marker. Positions the designated marker on the assigned trace at the specified X value. The value is in the x axis units (which is often frequency or time).
MKF?	:CALCulate:MARKer[1]|2|3|4:X?	The HP/Agilent 8590-Series analyzer outputs data in the format: 750E6. The Agilent ESA analyzer outputs data in the format: +7.50000000E+008.
MKFC	:CALCulate:MARKer[1]|2|3|4:FCOunt[:STATe] OFF|ON|0|1	Turns the marker frequency counter on or off.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKFCR		Sets the resolution of the marker frequency counter.
MKFCR <freq>	:CALCulate:MARKer:FCOunt:RESolution <real>	Sets the resolution of the marker frequency counter. AUTO ON couples the marker counter resolution to the frequency span.
MKFCR AUTO	:CALCulate:MARKer:FCOunt:RESolution:AUTO ON|1	Sets the resolution of the marker frequency counter so it is automatically coupled to the frequency span, generating the fastest accurate count.
MKFCR UP|DN MKFCR?	:CALCulate:MARKer:FCOunt:RESolution?	The HP/Agilent 8590-Series analyzer outputs data in the format: 1000. The Agilent ESA analyzer outputs data in the format: +1000.
MKMIN		Moves active marker to minimum signal detected.
	:CALCulate:MARKer[1]|2|3|4:MINimum	Places the selected marker on the lowest point on the trace that is assigned to that particular marker number.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKN		Activates and moves the marker to the specified frequency.
	:CALCulate:MARKer[1]|2|3|4:MODE POSition	Positions the designated marker on the assigned trace at the specified x value. The value is in the x axis units (which is often frequency or time).
	:CALCulate:MARKer[1]|2|3|4:X <param>	Positions the designated marker on the assigned trace at the specified x position.
MKN?	:CALCulate:MARKer[1]|2|3|4:MODE?	The HP/Agilent 8590-Series analyzer outputs data in the format: 750E6. The Agilent ESA analyzer outputs data in the format: +7.50000000E+008.
MKNOISE		Displays the average noise level at the marker.
	:CALCulate:MARKer[1]|2|3|4:FUNCtion NOISe|OFF	Selects the marker function for the specified marker. NOISe is a noise measurement.
MKNOISE?	:CALCulate:MARKer[1]|2|3|4:FUNCtion?	The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent ESA analyzer outputs 1 or 0.
MKOFF		Turns off either the active marker or all the markers.
	:CALCulate:MARKer[1]|2|3|4:STATe OFF|ON|0|1	Turns the selected marker on or off.
MKOFF ALL	:CALCulate:MARKer:AOFF	Turns off all the markers on all the traces.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKP	:CALCulate:MARKer[1]|3|3|4:X:POSition <integer>	Places the active marker at the given x coordinate.
MKP?	:CALCulate:MARKer[1]|3|3|4:X:POSition?	The HP/Agilent 8590-series analyzer outputs data in the format: 200. The Agilent ESA series analyzer outputs data in the format: +2.00000000E+002.
MKPAUSE		Pauses the sweep at the active marker for the duration of the delay period.
MKPK		Positions the active marker on a signal peak.
MKPK HI	:CALCulate:MARKer[1]|2|3|4:MAXimum	Places the selected marker on the highest point on the trace that is assigned to that particular marker number.
MKPK NL	:CALCulate:MARKer[1]|2|3|4:MAXimum:LEFT	Places the selected marker on the next highest signal peak to the left of the current marked peak.
MKPK NH	:CALCulate:MARKer[1]|2|3|4:MAXimum:NEXT	Places the selected marker on the next highest signal peak from the current marked peak.
MKPK NR	:CALCulate:MARKer[1]|2|3|4:MAXimum:RIGHt	Places the selected marker on the next highest signal peak to the right of the current marked peak.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKPX		Specifies the minimum signal excursion for the spectrum analyzer internal peak-identification routine.
MKPX <value>	:CALCulate:MARKer:PEAK:EXCursion <rel_ampl>	Specifies the minimum signal excursion for the analyzer internal peak identification routine to recognize a signal as a peak. This applies to all traces and all windows.
MKPX UP|DN		
MKPX?	:CALCulate:MARKer:PEAK:EXCursion?	The HP/Agilent 8590-Series analyzer outputs data in the format: 6.00. The Agilent ESA analyzer outputs data in the format: +6.00000000E+000.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKREAD		Selects the type of active trace information displayed by the spectrum analyzer marker readout.
MKREAD FRQ MKREAD SWT MKREAD IST MKREAD PER	:CALCulate:MARKer[1]|2|3|4:X:READout FREQuency|TIME|ITIMe|PERiod	Selects the units for the x-axis readout of the marker. Available units are: frequency, time, inverse of time, period.
MKREAD FFT		FFT is an invalid parameter for the Agilent ESA spectrum analyzers.
MKREAD?	:CALCulate:MARKer[1]|2|3|4:X:READout?	The HP/Agilent 8590-Series analyzer returns marker readout in the format: FRQ SWT IST or PER. The Agilent ESA analyzer returns FREQ, TIME, ITIM, or PER.
MKRL		Sets the reference level to the amplitude value of the active marker.
	:CALCulate:MARKer[1]|2|3|4[:SET]:RLEVel	Sets the reference level to the specified marker amplitude.
MKSP		Sets the start and stop frequencies to the values of the delta markers.
	:CALCulate:MARKer[1]|2|3|4[:SET]:SPAN	Sets the span to the value of the specified marker frequency. The specified marker must be in delta mode. Select the delta marker mode with :CALCulate:MARKer [1]|2|3|4:MODE:DELTa.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKSS		Sets the center frequency step size to the marker frequency.
	:CALCulate:MARKer[1]|2|3|4[:SET]:STEP	Sets the center frequency step size equal to the specified marker frequency.
MKSTOP		Stops the sweep at the active marker.
MKTBL		Turns the marker table on or off.
	:CALCulate:MARKer:TABLe:STATe OFF|ON|0|1	
MKTBL?	:CALCulate:MARKer:TABLe:STATe?	The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent ESA analyzer outputs 1 or 0.
MKTRACE		Moves the active marker to a corresponding position in trace A, trace B, or trace C.
MKTRACE TRA MKTRACE TRB MKTRACE TRC	:CALCulate:MARKer[1]|2|3|4:TRACe:AUTO OFF|ON|0|1	Automatically puts markers at the same x position on all the traces.
	:CALCulate:MARKer[1]|2|3|4:TRACe <integer>	Assigns the specified marker to the designated trace 1, 2, or 3.
MKTRACE?	:CALCulate:MARKer[1]|2|3|4:TRACe?	The HP/Agilent 8590-Series analyzer returns TRA, TRB, or TRC. The Agilent ESA analyzer returns +1, +2, or +3.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MKTRACK		Moves the signal with an active marker to the center of the spectrum analyzer display and keeps the signal peak at center screen.
	:CALCulate:MARKer[1]|2|3|4:TRCKing[:STATe] OFF|ON|0|1	Turns marker signal tracking on or off. It continuously puts the selected marker on the highest displayed signal peak and moves it to the center frequency. This allows you to keep a signal on the display that is drifting in frequency.
MKTRACK?	:CALCulate:MARKer[1]|2|3|4:TRCKing[:STATe]?	The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent ESA analyzer outputs 1 or 0.
MKTYPE		Changes the type of the current active marker.
ML		Specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level.
ML <value>	[:SENSe]:POWer[:RF]:MIXer:RANGe[:UPPer] <ampl>	Specifies the maximum power at the input mixer for a signal that is equal to or below the reference level.
ML UP|DN		
ML?	[:SENSe]:POWer[:RF]:MIXer:RANGe[:UPPer]?	The HP/Agilent 8590-Series analyzer outputs data in the format: -10. The Agilent ESA analyzer outputs data in the format: -1.00000000E+001.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
MOD		Stores the remainder from the division of source 1 by source 2 in the destination.
MODE		Returns a "0" if the mode of operation is spectrum analysis. A number other than "0" is returned if the operating mode (also called "personality") is other than spectrum analysis.
MOV	:TRACe:COPY <source_trace>,<dest_trace>	Copies the source values into the destination. <dest_trace,<num_value> Transfers the source trace to the destination trace. Source traces are: TRACE[1|2|3] Destination traces are: TRACE[1|2|3]
MPY		Multiplies the sources, point by point, and places the results in the destination.
MSI		Allows you to specify the current mass storage device as the spectrum analyzer memory or a memory card.
MXM		Compares source 1 and source 2, point by point, sending the greater value of each comparison to the destination.
MXMH	:TRACe:[1]|2|3:MODE MAXHold	Updates trace elements with maximum level detected.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
NDB	:CALCulate:BWIDth | BANDwidth:NDB<rel_ampl>	Specifies the distance (in dB) from the signal peak for the N dB points measurement (NDBPNT).
NDB?	:CALCulate:BWIDth | BANDwidth:NDB?	The HP/Agilent 8590-Series analyzer outputs data in the format: -3. The Agilent ESA analyzer outputs data in the format: -3.00000000E+000.
NDBPNT	:CALCulate:BWIDth | BANDwidth[:STATe] OFF | ON | 0 | 1	Turns the N dB points measurement on or off.
NDBPNT?	:CALCulate:BWIDth | BANDwidth[:STATe]?	The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent ESA analyzer outputs 1 or 0.
NDBPNTR?	:CALCulate:BWIDth | BANDwidth:RESult?	Returns the bandwidth measured by the N dB points measurement (NDBPT). The HP/Agilent 8590-Series analyzer outputs data in the format: -1E1. The Agilent ESA analyzer outputs data in the format: -1.00000000E+002.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
NRL	:DISPlay:WINDow:TRACe:Y[:SCALe]:NRLevel <rel_ampl>	Sets the normalized reference level.
NRL?	:DISPlay:WINDow:TRACe:Y[:SCALe]:NRLevel?	The HP/Agilent 8590-series analyzer outputs data in the format: 10. The Agilent ESA series analyzer outputs data in the format: +1.00000000E+001.
OA		Returns the value of the active function.
OBW		Performs the occupied bandwidth measurement using the value for occupied bandwidth percent (OBWPCT).
OBWPCT		Specifies the percent of total power that is to be used in calculating the occupied bandwidth (OBW).
OL		Output current state in learn string format.
ONCYCLE		Executes the list of analyzer commands periodically.
ONDELAY		Executes the list of analyzer commands after the time value has elapsed.
ONEOS		Executes the list of analyzer commands after the end of the sweep.
ONMKR		Performs the list of analyzer commands when the sweep reaches the marker position.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ONMKRU		Executes the list of analyzer commands whenever the value or the units of the active marker are changed.
ONPWRUP		Executes the list of spectrum analyzer commands once on power up.
ONSRQ		Executes the list of analyzer commands whenever a service request occurs.
ONSWP		Executes the list of analyzer commands at the beginning of the sweep.
ONTIME		Executes the list of analyzer commands at the specified time.
OP		Returns the coordinates of the lower-left and upper-right corners of the spectrum analyzer display (P1,P2).
OUTPUT		Allows the spectrum analyzer to send data to other devices on the GPIB.
PA		Moves the pen to a vector location on the spectrum analyzer screen relative to the reference coordinates (0,0).
PARSTAT		Returns parallel port status.
PCTAM		Turns the percent AM measurement on or off.
PCTAMR		Returns the percent AM measured by the percent AM measurement (PCTAM).

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
PD		Instructs the spectrum analyzer to plot vectors on the spectrum analyzer screen until a PU command is received.
PDA		Sums the probability distribution of amplitude in the destination trace with the amplitude distribution function of the source trace.
PDF		Increments an element of the destination trace whenever the corresponding element of the source trace exceeds a threshold.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
PEAKS		Sorts signal peaks by frequency or amplitude, stores the results in the destination trace, and returns the number of peaks found.
	:TRACe:MATH:PEAK[:DATA]?	Outputs the signal peaks to the controller, sorted by frequency or by amplitude. The sort mode is determined by the command :TRACe:MATH:PEAK:SORT. The commands :CALCulate:MARKer:PEAK:EXCursion and :CALCulate:MARKer:PEAK:THReshold are used to determine what is a signal peak. To get the number of signals found meeting the specified limits, use the query :TRACe:MATH:PEAK:POINts.
	:TRACe:MATH:PEAK:POINts?	Outputs the number of signal peaks identified. The amplitude of the peaks can then be queried with :TRACe:MATH:PEAK[:DATA]?
	:TRACe:MATH:PEAK:SORT AMPLitude | FREQuency	Determines if the signals in the :TRACe:MATH:PEAK[:DATA]? query should be sorted by frequency or amplitude. Frequency sorts the identified peaks by increasing frequency.
PKDLMODE		Selects the signal peaks that are displayed in the peak table.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
PKPOS		Returns a value, which is the index of the maximum value in trace A, trace B, trace C, or user-defined trace.
PKRES		Returns the x-axis coordinates of the peaks in the peak table.
PKSORT		Selects how the signal peaks listed in the peak table are sorted: by decreasing amplitude or by ascending frequency.
PKTBL		Turns the peak table on or off.
PKZMOK		Returns a "0" if the peak zoom routine (PKZOOM) found only the spectrum analyzer local oscillator feedthrough, otherwise a "1" is returned.
PKZOOM		Automatically tunes the spectrum analyzer to the signal with the highest amplitude level while narrowing the frequency span to the specified frequency span.
PLOT		Initiates a plotter output of the screen data to the remote interface.
PLTPRT		Directs the plotter output to GPIB, serial or parallel ports.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
POWERON POWERON?	 :SYSTem:PON:TYPE PRESet|LAST :SYSTem:PON:TYPE?	Selects the state the spectrum analyzer will be in when it is turned on: IP (instrument preset) or LAST state. The response is: PRESET or LAST.
PP	[:SENSe]:POWer[:RF]:PCENter	Performs a preselector peak. Centers the preselector tracking to maximize amplitude of the signal at the specified marker by minimizing the loss through the filter. This command applies only to the following Agilent ESA spectrum analyzer models: Agilent E4404B Agilent E4405B Agilent E4407B Agilent E4408B
PR		Moves the pen to a new plot location on the spectrum analyzer screen relative to the current coordinates in display units.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
PREAMPG	[:SENSe]:CORRection:OFFSet [MAGNitude] <rel_ampl>	Subtracts a positive or negative preamplifier gain value from the displayed signal.
PREAMPG?	[:SENSe]:CORRection:OFFSet[MAGNitude]?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.
PREFX		Specifies or changes the prefix used in save and recall operations.
PRINT		Initiates output of the spectrum analyzer display to a printer.
PRNPRT		Directs the printer output to GPIB, serial or parallel ports.
PRNTADRS		Allows you to set the GPIB address of the printer.
PSTATE		Protects all of the spectrum analyzer user state and trace registers from being changed.
PU		Instructs the spectrum analyzer not to plot vectors on the spectrum analyzer screen until a PD command is received.
PURGE		Deletes the specified file from the current mass storage device. Replaced by DELETE.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
PWRBW		Computes the bandwidth around the trace center, which includes signals whose total power is a specified percentage of the total trace signal power.
PWRUPTIME		Returns the number of milliseconds that have elapsed since the spectrum analyzer was turned on.
PWRUPTIME?	:SYSTem:PON:TIME?	The HP/Agilent 8590-Series analyzer outputs data in the format: 1.91557506E8. The Agilent ESA analyzer data output format is under development, and will be different than the HP/Agilent 8590-Series analyzer output format.
RB		Specifies the resolution bandwidth.
RB <value>	[:SENSe]:BANDwidth|BWIDth[:RESolution] <freq>	Couples the resolution bandwidth to the frequency span.
RB AUTO	[:SENSe]:BANDwidth|BWIDth[:RESolution]:AUTO OFF|ON|0|1	AUTO parameters ON|OFF are not available for the HP/Agilent 8590-Series spectrum analyzers.
RB UP|DN		
RB?	[:SENSe]:BANDwidth|BWIDth[:RESolution]?	The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
RCLS	*RCL	Recalls spectrum analyzer state data from one of nine state registers in spectrum analyzer memory. These registers do not appear in a FILE catalog.
RCLT	:MMEMory:LOAD:TRACe <label>,<file_name>	Recalls previously saved trace data, amplitude factors, or limit-line data from the trace registers in spectrum analyzer memory. These registers are specially mapped to named files. The contents of the file are loaded into the specified trace. See the LOAD command.
RELHPIB		Releases spectrum analyzer control of the GPIB.
REPEAT... UNTIL		REPEAT/UNTIL forms a looping construct.
RESETRL		Resets the reference level to instrument preset value.
RETURN		Stops the operation of a user-defined command and returns program operation to the point where the user-defined function was called.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
REV REV?	 *IDN?	Returns the date code of the firmware revision number in YYMMDD format. The HP/Agilent 8590-Series analyzer returns the firmware revision number date code in the format: 950129. The Agilent ESA analyzer returns the format: Hewlett-Packard, HP E4401B, US00000084, A.00.00.
RL RL <value> RL UP|DN RL?	 :DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel <ampl> :DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel?	Specifies the amplitude value of the reference level. Sets the amplitude value of the reference level for the y-axis. The active window is assumed when no window is specified. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.
RLPOS		Selects the position of reference level.
RMS		Returns the root mean square value of the trace in measurement units.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ROFFSET		Offsets all amplitude readouts without affecting the trace.
	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_ampl>	Sets the amplitude reference level for the y-axis. When no window is specified, the active window is assumed.
ROFFSET?	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel:OFFSet?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.
RQS		Sets a bit mask for service requests.
SAVEMENU		Saves menu 1 under the specified menu number.
SAVES		Saves the currently displayed instrument state in spectrum analyzer memory. These registers do not appear in a FILE catalog.
	:MMEMory:LOAD:STATe <reg_number>,<file_name>	The only acceptable delimiter is a single quote('). Only traces and states are supported; limit lines and ampcor are not supported. Use only file extensions: .TRC, .TRB, .TRA, and .STA. A disk drive name (C: or A:) must be included in the file name. States and traces saved using HP/Agilent 8590-Series analyzers cannot be read by Agilent ESA analyzers.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SAVET SAVET TRA SAVET TRB SAVET TRC SAVET LIMILINE SAVET AMPCOR	 :MMEMory:STORe:TRACe <label>,<file_name> :MMEMory:STORe:LIMit LLINe1|LLINe2, <file_name>	Saves the selected trace data and state information, amplitude correction factors, or limit-line tables in spectrum analyzer memory. These registers are specially mapped to named files. Agilent ESA analyzers save only state information registers *SAV and *RCK. The only acceptable delimiter is a single quote('). Only traces and states are supported; limit lines and ampcor are not supported. Use only file extensions: .TRC, .TRB, .TRA, and .STA. A disk drive name (C: or A:) must be included in the file name. States and traces saved using HP/Agilent 8590-Series analyzers cannot be read by Agilent ESA analyzers.
SAVRCLF		Specifies either a save or recall operation.
SAVRCLN		Specifies the number to append to the prefix for a save or recall operation, and initiates the transfer of data.
SAVRCLW		Specifies the data to be transferred.
SEGDEL		Deletes the specified segment from the limit-line tables.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SENTER		Enters the limit-line data in either the upper and lower limit-line tables or the mid and delta table for limit lines based on frequency.
SENTERT		Enters the limit-line data in either the upper and lower limit-line table or the mid and delta table for limit lines based on sweep time.
SER SER?	 *IDN or, *IDN?	Returns the serial number suffix of the spectrum analyzer. For example, serial number 4537450345 will return 0345. The HP/Agilent 8590-Series analyzer returns the serial number suffix in the format: 0345. The Agilent ESA analyzer returns the format: Hewlett-Packard, HP ESA-E1500B, US4537450345, A.00.00.
SETDATE SETDATE?	 :SYSTem:DATE <year>,<month>,<day> :SYSTem:DATE?	Sets the date of the real-time clock. Year is a 4-digit integer. Month is an integer 1 to 12. Day is an integer 1 to 31 (depending on the month). The HP/Agilent 8590-Series analyzer returns the instrument date in the format: YYMMDD. The Agilent ESA analyzer returns the format: +YYYY, +MM, +DD.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SETTIME	:SYSTem:TIME <hour>,<minute>,<second>	Sets the time of the real-time clock. Hour must be an integer 0 to 23. Minute must be an integer 0 to 59. Second must be an integer 0 to 59.
SETTIME?	:SYSTem:TIME?	The HP/Agilent 8590-Series analyzer returns the instrument time in the format: HHMMSS. The Agilent ESA analyzer returns the format: +HH, +MM, +SS.
SMOOTH		Smooths the trace according to the number of points specified for the running average.
SMOOTH TRA? SMOOTH TRB? SMOOTH TRC?	:TRACe:MATH:SMOoth <trace>	Smooths the trace according to the number of points specified in :TRACe:MATH:SMOoth:POINts. Traces are: TRACe[1|2|3]. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C.
	:TRACe:MATH:SMOoth:POINts <integer>	Specifies the number of points that will be smoothed in :TRACe:MATH:SMOoth.
SNGLS	:INITiate:CONTinuous OFF|0	Selects single-sweep mode.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SP		Changes the total displayed frequency range symmetrically about the center frequency.
SP <value>	[:SENSe]:FREQuency:SPAN <freq>	Set the frequency span.
SP UP|DN		
SP?	[:SENSe]:FREQuency:SPAN?	The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.
SPEAKER		Turns the internal speaker on or off.
SPEAKER ON|OFF	:SYSTem:SPEaker[:STATe] OFF|ON|0|1	
SPZOOM		Places a marker on the highest on-screen signal (if an on-screen marker is not present), turns on the signal track function, and activates the span function.
	:CALCulate:MARKer[1]|2|3|4:STATe OFF|ON|0|1	
	:CALCulate:MARKer[1]2|3|4:MAXimum	
	:CALCulate:MARKer[1]2|3|4:TRCKing[:STATe] OFF|ON|0|1	

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SQLCH	[:SENSe]:DEMod:SQUelch <number>	Sets the squelch level. Sets the squelch threshold by setting the squelch level.
SQR		Places the square root of the source into the destination.
SRCALC		Selects internal or external leveling for use with the built-in tracking generator.
SRCAT	:SOURce:POWer:ATTenuation <ampl> :SOURce:POWer:ATTenuation:AUTO OFF|ON|0|1	Attenuates the source output level. Selects if the source output level attenuator will be set automatically.
SRCNORM		Subtracts trace B from trace A, adds the display line, and sends the result to trace A.
SRCPOFS SRCPOFS?		Offsets the source power level readout.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SRCPSTP		Selects the source-power step size.
SRCPSTP <numeric>	:SOURce:POWer:STEP[:INCRement] <ampl>	Specifies the source power step size to be one vertical scale division.
SRCPSTP AUTO	:SOURce:POWer:STEP:AUTO ON|1	
SRCPSTP?	:SOURce:POWer:STEP[:INCRement]?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.
SRCPSWP		Selects sweep range of the source output.
	:SOURce:POWer:SPAN <rel_ampl> or, :SOURce:POWer:SWEep <rel_ampl>	Specifies the range of power levels through which the source output will sweep. Use :SOURce:POWer:STARt to set the power level at the start of the power sweep.
	:SOURce:POWer:MODE FIXed|SWEep	Sets the source output to be at a single amplitude (fixed) or to sweep through a range of power levels.
SRCPSWP?	:SOURce:POWer:SWEep?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SRCPWR		Selects the source power level.
	:SOURce:POWer[:LEVel][:IMMediate][:AMPLitude] <ampl>	Specifies the source output power level and turns on the source. An offset power level can be added to the output power to compensate for system losses between the source and the receiver.
	:SOURce:POWer:MODE FIXed|SWEep	Sets the source output to be at a single amplitude (fixed) or to sweep through a range of power levels.
SRCPWR?	:SOURce:POWer[:LEVel][:IMMediate][:AMPLitude]?	The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent ESA analyzer outputs data in the format: +1.00000000E+001.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SRCTK		Adjusts tracking of source output with spectrum analyzer sweep (3.0 GHz tracking generator only). All SCPI commands described here apply to the following Agilent ESA spectrum analyzer models having options 1DN (50 ohm tracking generator) or 1DQ (75 ohm tracking generator) only: E4402B E4403B E4404B E4405B E4407B E4408B
	:SOURce:POWer:TRCKing <number>	Adjusts the tracking of the source output with the spectrum analyzer sweep.
	:SOURce:POWer:TRCKing:PEAK	Automatically adjusts the tracking of the source output with the spectrum analyzer sweep.
SRCTK?	:SOURce:POWer:TRCKing?	The HP/Agilent 8590-Series analyzer outputs data in the format: 2048. The Agilent ESA analyzer outputs data in the format: +2048.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SRCTKPK	:SOURce:POWer:TRCKing:PEAK	Adjusts tracking of source output with spectrum-analyzer sweep (3.0 GHz tracking generator only).
SRQ		The SRQ command is used by an external controller to simulate interrupts from the spectrum analyzer.
SS SS <value> SS AUTO SS UP|DN SS?	 [:SENSe]:FREQuency:CENTer:STEP[:INCRement] <freq> [:SENSe]:FREQuency:CENTer:STEP:AUTO OFF|ON|0|1 [:SENSe]:FREQuency:CENTer:STEP[:INCRement]?	Specifies center-frequency step size. Specifies whether the step size is set automatically based on the span. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
ST		Specifies the time in which the spectrum analyzer sweeps the displayed frequency (or time) range.
ST <value>	[:SENSe]:SWEep:TIME <time>	Automatically selects the fastest sweep time for the current span.
ST AUTO	[:SENSe]:SWEep:TIME:AUTO OFF|ON|0|1	
ST UP|DN		
ST?	[:SENSe]:SWEep:TIME?	The HP/Agilent 8590-Series analyzer outputs data in the format: .500000. The Agilent ESA analyzer outputs data in the format: +5.0000000E-003.
STB		Returns to the controller the decimal equivalent of the status byte.
STDEV		Returns the standard deviation of the trace amplitude in measurement units.
STOR		Stores data on a RAM card.
SUB		Subtracts source 2 from source 1, point by point, and sends the difference to the destination.
	:TRACe:MATH:SUBTract <destination_trace>,<source_trace1>, <source_trace2>	Performs the math expression and places the result in the destination trace.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
SUM		Returns the sum of the amplitudes of the trace elements in measurement units.
SUMSQR		Returns the sum of the squares of the amplitude of each trace element.
SWPCPL		Selects a stimulus-response (SR) or spectrum analyzer (SA) auto-coupled sweep time.
SWPCPL SR|SA	[:SENSe]:SWEep:TIME:AUTO:MODE SRESponse|SANalyzer	Specifies the type of automatic coupling for the fastest sweep time at the current span. This varies based on the current measurement mode.
SWPCPL?	[:SENSe]:SWEep:TIME:AUTO:MODE?	The HP/Agilent 8590-Series analyzer returns SR or SA. The Agilent ESA analyzer returns SRES or SAN.
SYNCMODE		Selects either the horizontal and vertical synchronizing constants, or the synchronization rate for the internal monitor.
TA		Returns trace A amplitude values from the spectrum analyzer to the controller.
	TRACe[DATA]? TRACE1	Returns TRACE1 (trace A) amplitude values from the spectrum analyzer to the controller.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
TB	TRACe[DATA]? TRACE2	Returns trace B amplitude values from the spectrum analyzer to the controller. Returns TRACE2 (trace B) amplitude values from the spectrum analyzer to the controller.
TDF TDF A|B|M|I TDF P TDF?		Formats trace information for return to the controller. TDF P is the only supported format. The queries TRA?, TRB?, and TRC? always return in TDF P format.
TEXT		Writes text on the analyzer screen at the current pen position.
TH TH <value> TH AUTO TH UP|DN TH?		Clips signal responses below the threshold level.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
TIMEDATE	:SYSTem:TIME <hour>, <minute>, <second> :SYSTem:DATE <year>,<month>,<day>	Sets the time and date of the real-time clock. Year is a 4-digit integer. Month is an integer 1 to 12. Day is an integer 1 to 31 (depending on the month).
TIMEDATE?	:SYSTem:DATE? and :SYSTem:TIME?	The HP/Agilent 8590-Series analyzer returns the instrument timedate in the format: YYMMDDHHMMSS. The Agilent ESA analyzer returns the format: +YYYY, +MM, +DD for the date query, and +HH, +MM, +SS for the time query. Both individual SCPI queries need to be sent in order to receive the same amount of information as was given with the single HP/Agilent 8590-Series query.
TIMEDSP	:DISPlay:ANNotation:CLOCk[:STATe] OFF|ON|0|1	Turns the real-time clock display on or off. Turns the spectrum analyzer display of date and time on and off. The time and date pertain to all windows.
TIMEDSP?	:DISPlay:ANNotation:CLOCk[:STATe]?	The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent ESA analyzer outputs 1 or 0.
TITLE	:DISPlay:ANNotation:TITLe:DATA <string>	Activates the screen title mode.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
TM		Specifies trigger mode.
TM FREE TM VID TM LINE TM EXT	:TRIGger[:SEQuence]:SOURce IMMediate | VIDeo | LINE | EXTernal | TV	Specifies the source (or type) of triggering used to start a measurement. Immediate is free-run triggering. Video triggers on the video signal. Line triggers on the power line signal. External allows you to connect an external trigger source. TV triggers on a selected line of a TV frame.
TM?	:TRIGger[:SEQuence]:SOURce?	The HP/Agilent 8590-Series analyzer outputs: FREE, VID, LINE, or EXT. The Agilent ESA analyzer outputs: FREE, VID, LINE, EXT, or TV.
TOI		Turns the third-order intermodulation (TOI) measurement on or off.
TOIR		Returns the highest third-order intermodulation product measured by the third-order intermodulation measurement (TOI).

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
TRA TRB TRC	:TRACe[:DATA] <trace_name>,<definite_length_block>	Controls trace data input or output. Transfers the trace data from the controller to the instrument. The query reads trace data out of the instrument. The data is in a machine readable format that the analyzer understands.
TRA? TRB? TRC?	:TRACe[:DATA]? <trace_name>	The data format for the command and query is always TDF P. The HP/Agilent 8590-Series analyzer returns data in the format: -57.71, -58.12, -56.87. The Agilent ESA analyzer returns data in the format: -5.46380000E+001, -5.44410000E+001, -5.47590000E+001. This is an example of IEEE NR3 numeric response data.
TRCMEM		Returns a non-negative integer that indicates the total number of trace registers available for SAVET and RCLT.
TRDEF		Creates a user-defined trace.
TRDSP		Turns the display of trace A, B, or C on or off. It does this without clearing the trace (measurements can still be taken).
TRGRPH		Displays a compressed trace on the analyzer display.
TRMATH		Executes a list of analyzer commands at the end of each sweep.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
TRPRST		Sets the trace operations to their preset values.
TRSTAT	TRACe[1]|2|3:MODE?	Returns the status of traces A, B, and C: clear write, blank, view, minimum hold, or maximum hold. Traces are: TRACE[1|2|3]. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C. The HP/Agilent 8590-Series analyzer returns the format: CLRW A;BLANK B;BLANK C;. The Agilent ESA analyzer returns the format: WRIT;BLAN;BLAN. All three traces in the Agilent ESA analyzer will be queried, with an EOI after each response.
TS	INITiate[:IMMediate] *OPC	Starts and completes one full sweep before the next command is executed. Allows you to determine when the spectrum analyzer has started to execute all commands prior to and including TS.
TVLINE	:TRIGger[:SEQuence]:TV:LINE <line> :TRIGger[:SEQuence]:TV:LINE?	Sets the line number of the horizontal line of video on which to trigger. Returns the TV line number.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
TVSFRM	:TRIGger[:SEQuence]:TV:FMODe ENTire|ODD|EVEN :TRIGger[:SEQuence]:TV:FMODe?	Specifies type of video frame to trigger on. Returns the video frame type specified for TV field mode.
TVSTND	:TRIGger[:SEQuence]:TV:STANdard MNTSc|JNTSc|MPAL|BPAL|NPAL|CPAL|LSEC :TRIGger[:SEQuence]:TV:STANdard?	Selects the triggering for the various formats available. Refer to *Chapter 5, Language Reference in the Agilent ESA Programmer's Guide* for more information about this command. Returns the selected TV standard.
TVSYNC	:TRIGger[:SEQuence]:TV:SLOPe POSitive|NEGative	Selects between negative and positive triggering for video frame formats.
TWNDOW		Creates a window trace array for the fast Fourier transform (FFT) function.
UP		Increases the active function by the applicable step size. Each HP/Agilent 8590-Series command to which DN can be applied will have <step> = DOWN|UP as a parameter in the SCPI command. UP (as well as DN) can only be sent as a parameter in SCPI.
USTATE		Transmits information that has been stored in the analyzer by the user.
VARDEF		Creates a user-defined variable and assigns it a value.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
VARIANCE		Returns the amplitude variance of the specified trace, in measurement units.
VAVG		Enables the video-averaging function, which averages trace points to smooth the displayed trace.
VAVG <number>	[:SENSe]:AVERage:COUNt <integer>	Specifies the number of measurements that are combined.
VAVG ON/OFF	[:SENSe]:AVERage[:STATe] OFF | ON | 0 | 1	Specifies the number of measurements that are combined. The value of successive measurements can be combined together to average out measurement variations.
VAVG?	[:SENSe]:AVERage:COUNt?	The HP/Agilent 8590-Series analyzer returns the count in the format: 100 when VAVG is ON, and returns 0 when VAVG is OFF. The Agilent ESA analyzer returns +100 when VAVG is ON, and returns 0 when VAVG is OFF.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
VB		Specifies the video bandwidth.
VB <value>	[:SENSe]:BANDwidth|BWIDth:VIDeo <freq>	
VB AUTO	[:SENSe]:BANDwidth|BWIDth:VIDeo:AUTO OFF|ON|0|1	Couples the video bandwidth to the resolution bandwidth.
VB UP|DN		
VB?	[:SENSe]:BANDwidth|BWIDth:VIDeo?	The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent ESA analyzer outputs data in the format: +750000000.
VBR		Specifies coupling ratio of video bandwidth to resolution bandwidth.
VBR <value>	[:SENSe]:BANDwidth|BWIDth:VIDeo:RATio <number>	Specifies the ratio of the video bandwidth to the resolution bandwidth. This parameter is multiplied by the resolution bandwidth to determine the automatic setting of the video bandwidth.
VBR UP|DN		
VBR?	[:SENSe]:BANDwidth|BWIDth:VIDeo:RATio?	The HP/Agilent 8590-Series analyzer outputs data in the format: .3000000. The Agilent ESA analyzer outputs data in the format: +3.00000000E-001.
VIEW	TRACe[1]|2|3:MODE VIEW	Displays trace A, trace B, or trace C, and stops taking new data into the viewed trace.

HP/Agilent 8590-Series Analyzers Command(s)	Corresponding SCPI Command(s)	Description/Comments
WAIT		Suspends all spectrum analyzer operation for the specified time duration.
WINNEXT		Makes the window that is currently not the active window, active.
WINOFF		Turns off the windows display.
WINON		Activates the windows display mode.
WINZOOM		Expands the size of the active window so that it fills the entire spectrum analyzer display.
XCH XCH TRA|TRB|TRC, TRA|TRB|TRC	:TRACe:EXCHange <trace_1>,<trace_2>	Exchanges traces. Exchanges two traces, point by point. Trace_1 choices are: TRACE[1|2|3] Trace_2 choices are: TRACE[1|2|3]
ZMKCNTR		Positions the zone marker at the specified frequency.
ZMKPKNL		Places the zone marker at the next signal peak that is left of the current position of the zone marker.
ZMKPKNR		Places the zone marker at the next signal peak that is left of the current position of the zone marker.
ZMKSPAN	Allows you to change the width of the zone marker.	

APPENDIX

The alternate commands listed in the following table provide compatibility with commands used by the HP/Agilent 8566A/B, HP/Agilent 8568A/B, and HP/Agilent 70000 Series analyzers. The equivalent commands for the HP/Agilent 8590-Series spectrum analyzers are listed in the far right column.

Alternate Commands	Description	HP/Agilent 8590-Series Command
A1	Clear write trace A	CLRW TRA
A2	Max hold trace A	MXMH TRA
A3	Store and view traceA	VIEW TRA
A4	Store and blank traceA	BLANK TRA
B1	Clear write trace B	CLRW TRB
B2	Max hold trace B	MXMH TRB
B3	Store and view trace B	VIEW TRB
B4	Store and blank trace B	BLANK TRB
BL	B – DL –> B	BML
C1	Trace A minus trace B off	AMB OFF
C2	Trace A minus trace B on	AMB ON
CA	Coupled input attenuation	AT AUTO
CR	Coupled resolution bandwidth	RB AUTO
CS	Coupled step size	SS AUTO
CT	Coupled sweep time	ST AUTO
CV	Coupled video bandwidth	VB AUTO
E1	Peak search	MKPK HI
E2	Enter marker into center frequency	MKCF
E3	Enter marker delta into center frequency step size	MKSS
E4	Enter marker amplitude into reference level	MKRL
EM	Erase graphics memory	CLRDSP
EX	Exchange trace A and B	AXB

Alternate Commands	Description	HP/Agilent 8590-Series Command
KSA	dBm amplitude units	AUNITS DBM
KSB	dBmV amplitude units	AUNITS DBMV
KSC	dBµV amplitude units	AUNITS DBUV
KSD	Volt amplitude units	AUNITS V
KSE	Screen title	TITLE
KSG	Video average on	VAVG ON
KSH	Video average off	VAVG OFF
KSM	Marker noise	MKNOISE
KSO	Marker value to span	MKSP
KSZ	Reference level offset	ROFFSET
KSc	Trace A plus trace B into trace A	APB
KSi	Exchange trace B and C	BXC
KSl	Trace B into trace C	BTC
KSm	Graticule off	GRAT OFF
KSn	Graticule on	GRAT ON
KSo	Annotation off	ANNOT OFF
KSp	Annotation on	ANNOT ON
L0	Display line off	DL OFF
M1	Marker off	MKOFF
M2	Marker normal	MKN
M3	Marker delta	MKD
MA	Marker amplitude	MKA?
MC	Marker count	MKFC
MT0	Marker track off	MKTRACK OFF
MT1	Marker track on	MKTRACK ON
O1	Output format, in real number format	TDF P
O2	Output format, in binary format, two bytes (word) per element	TDF B;MDSW
O3	Output format, in measurement data format	TDF M
O4	Output format, in binary format, 1 byte per element	TDF B;MDS B

Alternate Commands	Description	HP/Agilent 8590-Series Command
R1	Activates illegal command service request only	RQS 32
R2	Activates end of sweep, illegal command	RQS 36
R3	Activates broken hardware, illegal command	RQS 40
R4	Activates units key pressed, illegal command	RQS 34
RC	Recall state	RCLS
S1	Sweep continuous	OONTS
S2	Sweep single	SNGLS
SV	Save state	SAVES
T0	Threshold off	TH OFF
T1	Trigger mode free run	TM FREE
T2	Trigger mode line	TM LINE
T3	Trigger mode external	TM EXT
T4	Trigger mode video	TM VID
T7	Trigger mode level	GATECTL LEVEL
T8	Trigger mode edge	GATECTL EDGE