HP 85727A GSM Multiband
Transmitter Measurements Personality

Remote Programming Guide

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Regulatory Information

All regulatory information is in the calibration guide for your spectrum analyzer.

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Programming Commands

What's in This Guide

Use this remote programming guide with an HP 8590 series spectrum analyzer equipped with the HP 85727A GSM Multiband Transmitter Measurement Personality. It contains only the commands unique to the GSM Multiband Transmitter Measurement Personality. For all other analyzer commands refer to the *HP 8590 E-Series Programming Guide*.
This section contains both summary information and a set of command descriptions ordered alphabetically.

- Accessing the GSM Measurement Personality Mode for Remote Operation
- Programming Basics for GSM Measurement Personality Remote Operation
- Advanced Programming
- Table 6 Syntax Elements
- Table 7 Functional Index

NOTE: Refer to the *HP 85727A GSM Multiband Transmitter Measurement Personality User's Guide* for measurement descriptions and configuration

Accessing the GSM Analyzer Mode for Remote Operation

Before you can program the spectrum analyzer, you must connect the spectrum analyzer to a computer. Refer to the *HP 8590 Series Spectrum Analyzer Programmer's Guide* if you need further information.

All examples in this manual are written in HPBASIC and it is assumed that the HP-IB address is 18 and the select code of the controller part is 7.

NOTE: **RS 232 remote interface operation.** To obtain the measurement completed values referred to in "Determining When a Measurement is Completed" in this chapter, select **`RMT SYNC ON OFF`** (ON) from the **`Config`** menu.

To use the GSM program language, the GSM Transmitter Measurements Personality program must be in the spectrum analyzer's memory, and GSM Analyzer mode must be selected. Refer to the following procedures.

Loading the GSM Transmitter Measurements Personality

If you need to load the GSM Transmitter Measurements Personality, insert the HP 85727A GSM Transmitter Measurements Personality memory card into the analyzer's front-panel card reader. Enter the following command line:

```
OUTPUT 718;"LOAD/dGSM/;"          ! dGSM is the file name for the core
                                  ! portion of the GSM program.
```

Switching to the GSM Analyzer Mode

To switch to the GSM Analyzer mode from any other mode, enter the following command line:

```
OUTPUT 718;"MODE 10;"
```

Mode 10 is the GSM Analyzer mode.

Programming Basics for GSM Remote Operation

The following information explains the use of GSM remote commands. Refer to individual commands in this chapter, for specifics.

Using Command Name Prefixes

All GSM remote commands start with “ng". The command prefix can be in either upper-case or lower-case lettering.

The measurement groups are divided as follows:

ng_ prefix for the core group commands. The core group includes measurement configuration and physical channel commands.

ngi_ prefix for the intermod measurement group commands.

ngp_ prefix for the power vs. time measurement groups commands.

ngs_ prefix for the spurious measurement group commands.

ngos_ prefix for the output RF spectrum measurement group commands.

ngd_ prefix for the frequency and phase error measurement group commands. (Spectrum analyzer option 163 required.)

```
OUTPUT 718;"ng_AA;"              ! Execute the auto ARFCN command.
```

Selecting a Measurement Group

The remote command to load a GSM measurement group is "ng_GROUP" followed by either 1, 2, 3, 4, or 5. These numbers are explained below:

1 selects the power vs. time measurement group (ngp_).

2 selects the output RF spectrum measurement group (ngos_).

3 selects the spurious measurement group (ngs_).

4 selects the intermod measurement group (ngi_).

5 selects the phase and frequency error measurement group (ngd_). (Spectrum analyzer option 163 required.)

```
OUTPUT 718;"ng_GROUP 3;"         ! Selects the spurious group.
```

Loading a new measurement group with the ng_GROUP command may purge the previous measurement group.

NOTE: The GSM Transmitter Measurements Personality card must be fully inserted into the front panel card reader before you execute the GROUP command. If your spectrum analyzer does not have enough memory the measurements personality cannot be loaded all at once. An error occurs if the card is not inserted.

Using the Spectrum Analyzer MOV Command

You are encouraged to use the MOV (move) command with commands that require number parameters. Using MOV improves speed because no text gets displayed in the active function area during command execution.

```
OUTPUT 718;"MOV ng_TN,4;"        ! Set the timeslot number to 4.
```

Using GSM Measurement Setup and Measurement Commands

Many measurements require a setup command, followed by a measurement command. A setup command sets the spectrum analyzer parameters to the correct values for that measurement. You can change setup parameters (such as resolution bandwidth or video bandwidth) before executing the measurement command. The measurement command starts the actual measurement.

Using Multiple Bursts in GSM Measurements

Many GSM measurements require multiple bursts for accurate measurement results. Select the number of bursts to use for measurements before executing measurement setup and measurement commands.

```
OUTPUT 718;"MOV ng_NB,100;"      ! Select the number of bursts = 100.
```

Using the Repeat Command

You can use the ng_RPT command to repeat a Power, Power vs. Time, or Output RF Spectrum measurement. GSM parameters such as ARFCN and TN can be changed prior to executing ng_RPT.

```
OUTPUT 718;"MOV ng_ARFCN,26;"    ! Change the RF channel to number 26.
OUTPUT 718;"ng_RPT;"             ! Repeat the previous measurement at
                                 ! the new channel number.
```

NOTE: To repeat the last measurement at different user defined channels (ng_ARFCN = -1) you must specify the channel RF frequency with ng_CFA. For example:

```
OUTPUT 718;"MOV ng_CFA,890.2E6;"! Change the RF channel to 890.2 MHz.
OUTPUT 718;"MOV ng_CFA,890.2MHz;"! Change the RF channel to 890.2 MHz.
```

Determining When a Measurement is Completed

The external controller must wait for the measurement to be completed before trying to read the results or before sending a command for another measurement. The controller sends an ENTER command after sending a measurement command. A value is returned to the controller when the measurement is completed. A value of 1 indicates that the measurement successfully completed. If the value is greater than 1, an error was detected during the measurement (such as no signal).

```
10   OUTPUT 718; "ng_CPS;"        ! Setup for Carrier Power
                                  ! measurement
20   OUTPUT 718; "ng_CPM;"        ! Execute the Carrier Power
                                  ! measurement
30   ENTER 718; Meas_state        ! Enter the measurement state (the
                                  ! controller waits for the
                                  ! measurement to complete). A value
                                  ! is placed in the spectrum analyzer
                                  ! output buffer when the
                                  ! measurement is completed.
40   OUTPUT 718; "ng_CPA?;"       ! Query for measurement results
50   ENTER 718; Carrier_pwr       ! Enter the measurement value
```

Programming Examples

The following example shows how to load a measurement group into the spectrum analyzer's memory:

```
10  OUTPUT 718;"MOV ng_GROUP,1;"  ! Load the Power vs. Time measurement
                                  ! group into the spectrum analyzer's
                                  ! memory
```

The Power vs. Time Frame Measurement With a Spectrum Analyzer Trace Result

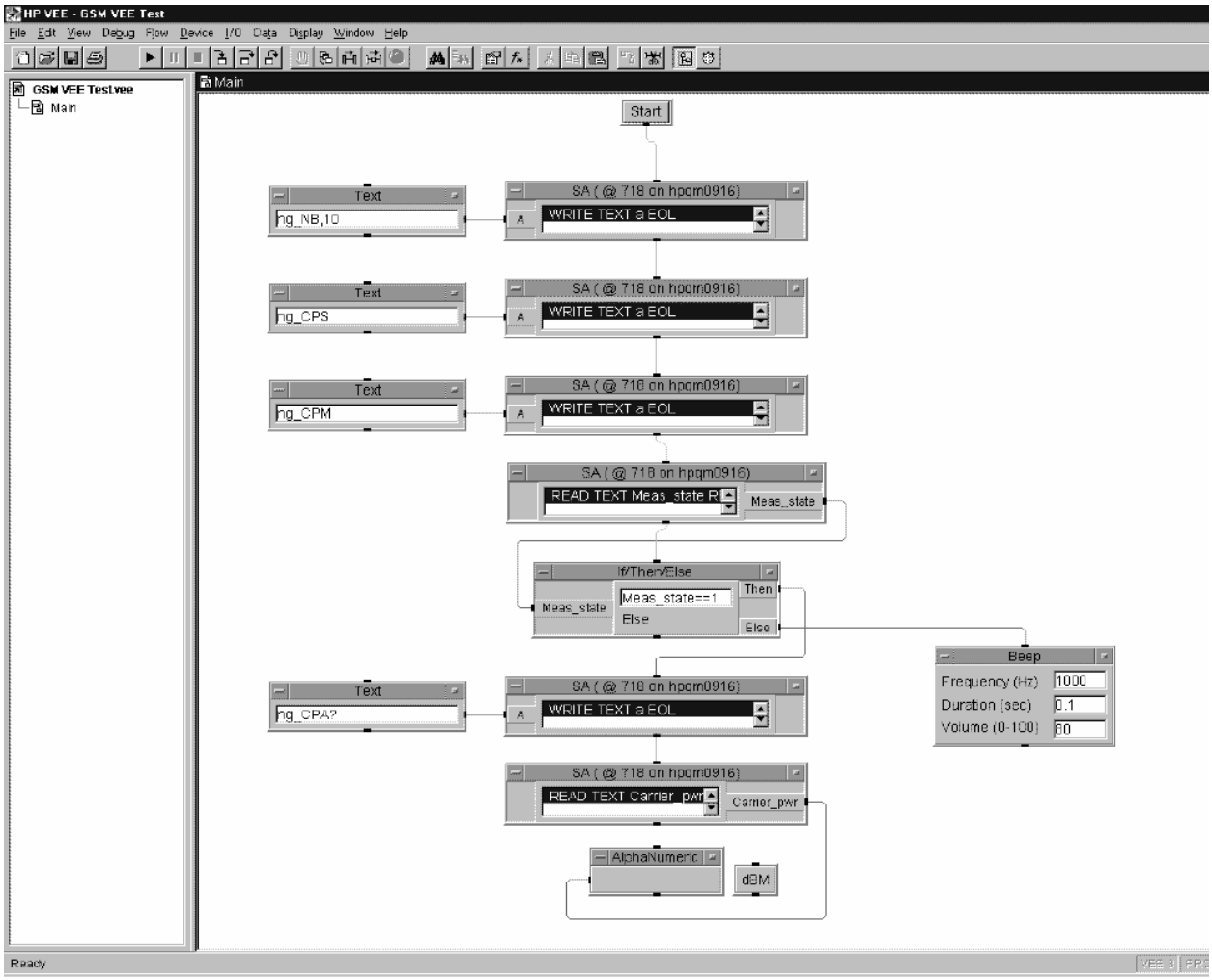
```
10   INTEGER Meas_state           ! Declare the measurement state
                                  ! variable.
20    INTEGER I                   ! Declare the loop variable.
30    REAL Trace_data(1:401)      ! Declare the measurement result
                                  ! array.
40    ASSIGN @Sa TO 718           ! Assign the i/o path to the spectrum
                                  ! analyzer.
50    OUTPUT @Sa;"MOV ng_NB,5;"   ! Set the number of bursts to 5.
60    OUTPUT @Sa;"ngp_FRS;"       ! Set up the Power vs. Time, Full
                                  ! Frame measurement.
70    OUTPUT @Sa;"ngp_FRM;"       ! Execute the Power vs. Time, Full
                                  ! Frame measurement.
80    ENTER @Sa;Meas_state        ! Enter the measurement state (the
                                  ! controller waits for the
                                  ! measurement to complete). A value
                                  ! is placed in the spectrum analyzer
                                  ! output buffer when the measurement
                                  ! is completed.
90    IF Meas_state=1 THEN        ! The measurement is completed, no
                                  ! errors detected.
100   OUTPUT @Sa;"TRA?;"          ! Query the measurement trace.
110     ENTER @Sa;Trace_data(*)   ! Enter the measurement result into
                                  ! the array.
120     FOR I=1 TO 401            ! Loop through all the trace
                                  ! elements.
130       PRINT Trace_data(I);    ! Print each trace element.
140     NEXT I
150  ELSE                         ! The measurement is completed,
                                  ! errors were detected.
160     IF Meas_state=2 THEN      ! The measurement state is 2.
170       DISP "No carrier detected"    ! A carrier was not detected.
180   END IF
190 END IF
200 END
```

The Carrier Power Measurement With Single Value Result

```
10   INTEGER Meas_state          ! Declare the measurement state
                                 ! variable.
20   REAL Carrier_pwr            ! Declare the measurement value
                                 ! variable.
30   ASSIGN @Sa TO 718           ! Assign the i/o path to the spectrum
                                 ! analyzer.
40   OUTPUT @Sa;"MOV ng_NB,10;"  ! Set the number of bursts to 10.
50   OUTPUT @Sa;"ng_CPS;"        ! Set up the Carrier Power
                                 ! measurement.
60   OUTPUT @Sa;"ng_CPM;"        ! Execute the Carrier Power
                                 ! measurement.
70   ENTER @Sa;Meas_state        ! Enter the measurement state (the
                                 ! controller waits for the
                                 ! measurement to complete). A value
                                 ! is placed in the spectrum analyzer
                                 ! output buffer when the measurement
                                 ! is completed.
80   IF Meas_state=1 THEN        ! The measurement is completed, no
                                 ! errors detected.
90     OUTPUT @Sa;"ng_CPA?;"     ! Query the measurement value.
100    ENTER @Sa;Carrier_pwr     ! Enter the measurement value.
110    DISP "Carrier power= ";
120    Carrier_pwr;"dBm"         ! Display the value.
130     ELSE                     ! The measurement is completed,
                                 ! errors were detected.
140      IF Meas_state=2 THEN    ! Condition: the measurement state
                                 ! is 2.
150      DISP "No carrier detected"     ! A carrier was not detected.
160     END IF
170   END IF
180 END
```

The Carrier Power Measurement Using HP VEE (Visual Engineering Environment)

The HP VEE programming tool is an ideal method for remote operation of the HP 8590E-Series spectrum analyzer and the GSM Transmitter Measurements Personality. Refer to the *HP VEE User's Guide* for information about adding and controlling instruments.
The following HP VEE program executes a Carrier Power Measurement.



NOTE: Ensure the time-out in Advanced Device configuration is set to 30 seconds or the execution time of the measurement, whichever is the greatest.

The Transmitter Spurious in TX Band Measurement With Multiple DLP Trace Results

```
10   INTEGER Meas_state           ! Declare the measurement state
                                  ! variable.
20   INTEGER Num_spurs            ! Declare the measurement result:
                                  ! number of spurs.
30   INTEGER Spur_frq_m           ! Declare the measurement result:
                                  ! spur frequency (MHz).
40   INTEGER Spur_frq_k           ! Declare the measurement result:
                                  ! spur frequency (kHz).
50   INTEGER Spur_amp             ! Declare the measurement result:
                                  ! spur amplitude.
60   INTEGER Spur_ok              ! Declare the measurement result:
                                  ! spur flag.
70   INTEGER I                    ! Declare the loop variable.
80   REAL Sp_freq(1:30)           ! Declare the array to hold spur
                                  ! frequency results (MHz).
90   REAL Sp_amp(1:30)            ! Declare the array to hold spur
                                  ! amplitude results (dBm).
100  INTEGER_Sp_ok(1:30)          ! Declare the array to hold spur flag
                                  ! results.
110  ASSIGN @SA TO 718            ! Assign the i/o path to the spectrum
                                  ! analyzer.
120  OUTPUT @Sa;"MOV ngs_RCVRF,0;" ! Set the spur measurement for
                                  ! transmitter measurements.
130  OUTPUT @Sa;"ngs_MEASTX;"     ! Execute the TX Band Spurious
                                  ! measurement.
130  ENTER @Sa;Meas_state         ! Enter the measurement state (the
                                  ! controller waits for the
                                  ! measurement to complete). A value
                                  ! is placed in the spectrum analyzer
                                  ! output buffer when the measurement
                                  ! is completed.
140  IF Meas_state=1 THEN         ! The measurement is completed, no
                                  ! errors detected.
150    OUTPUT @Sa;"ngs_SPCNT?;"   ! Query the number of spurs found.
160    ENTER @Sa;Num_spurs        ! Enter the number of spurs found.
170    IF Num_spurs<1 THEN        ! Condition: if the number if spurs
                                  ! is less than 1.
180    PRINT "No spurs found"
190    ELSE                       ! Condition: the number of spurs is
                                  ! greater than or equal to 1.
200      FOR I=1 TO Num_spurs     ! Loop through the spurs found.
210        OUTPUT @Sa;"ngs_SPFRQM[";I;"]?;"    ! Query to obtain the
                                                ! MHz portion.
```

```
220       ENTER @Sa;Spur_frq_m   ! Enter the MHz portion of the spur
                                 ! found.
230       OUTPUT @Sa;"ngs_SPFRQK[";I;"]?;"    ! Query to obtain the
                                              ! kHz portion.
240       ENTER @Sa;Spur_frq_k   ! Enter the kHz portion of the spur
                                 ! found.
250       Sp_freq(I)=Spur_frq_m+
                (Spur_frq_k/1000)      ! Assemble the frequency
                                       ! results into an array (MHz).
260       OUTPUT @Sa;"ngs_SPFAMP[";I;"]?;" ! Query to obtain the
                                           ! amplitude of the spur.
270       ENTER @Sa;Spur_amp     ! Enter the amplitude value of the
                                 ! spur found.
280       Sp_amp(I)=Spur_amp/10) ! Convert the amplitude value to
                                 ! dBm, then place it in the array.
290       OUTPUT @Sa;"ngs_SPOK[";I;"]?;" ! Query for the spur flag.
300       ENTER @Sa;Spur_ok      ! Enter the spur flag.
310       Sp_ok(I)=Spur_ok       ! Place the spur flag in the array.
320     NEXT I
330     PRINT "#  Freq (MHz)  Amp (dBm)"
340     PRINT " ____________  "
350     FOR I=1 TO Num_spurs     ! Loop through the spurs again.
360       PRINT I,Sp_freq(I),Sp_amp(I);! Print each spur, suppress
                                       ! carriage return and line
                                       ! feed.
370       IF Sp_ok(I)=1 THEN     ! Condition: if the flag value=1.
380         PRINT                ! Carriage return and line feed.
390       ELSE                   ! Condition: if the flag value=0.
400         PRINT "*"            ! *Carriage return and line feed.
410       END IF
420     NEXT I
430     END IF
440   END IF
450 END
```

The Phase and Frequency Error Measurement

```
10    REAL Fre,Ppe,Rpe
20    INTEGER Meas_state,I
30    !
40    ASSIGN @Sa TO 718                ! Assign i/o to Spectrum
50                                     ! Analyzer
60    OUTPUT @Sa;"ngd_PFS;";           ! Setup Phase Frequency Error
70    OUTPUT @Sa;"ngd_MEAS;";          ! Make Measurement
80    I=0
90    REPEAT
100   I=I+1                            ! Increment counter
110   ENTER @Sa;Meas_state             ! Enter the measurement state
120   OUTPUT @Sa;"ng_ARFCN;";          ! Set an Active Parameter to
130                                    ! suspend the measurement
140   IF (Meas_state<>1) THEN          ! If Measurement state not 1
150   PRINT "Meas Failed: ";Meas_state ! Measurement Failed
160   ELSE                             ! Otherwise
170   OUTPUT @Sa;"ngd_FRE?";           ! Measurement OK so read
180                                    ! results
190   ENTER @Sa;Fre

200   OUTPUT @Sa;"ngd_PPE?";
210   ENTER @Sa;Ppe
220   OUTPUT @Sa;"ngd_RPE?";
230   ENTER @Sa;Rpe
240   PRINT Fre,Ppe,Rpe                ! Print results
250   END IF
260   OUTPUT @Sa;"HD;";                ! Clear the Active Parameter
270                                    ! to re-enable the
280                                    ! measurement
290   UNTIL (I=10)                     ! Repeat 10 times
300   END
```

To load the GSM measurements personality remotely

1. Insert the HP 85727A GSM Transmitter Measurements Personality memory card into the analyzer's front-panel memory card reader.
2. Prepare the spectrum analyzer for the DONE command by doing an instrument preset and placing the spectrum analyzer into a single sweep mode.
3. Execute the take sweep (TS) command. You must execute the take sweep command before the DONE command.
4. Execute the DONE command.
5. Wait until the DONE command returns a "1."
6. Remove any personalities from the spectrum analyzer by executing the DISPOSE ALL command.
7. Wait until the DISPOSE ALL command has finished.
8. Use the spectrum analyzer's LOAD command to load the file called "dGSM" into spectrum analyzer memory.
9. Execute the take sweep (TS) command. You must execute the take sweep command before the DONE command.
10. Execute the DONE command.
11. Wait until the DONE command returns a "1."

This procedure describes how to use programming commands to load the GSM measurement personality into spectrum analyzer memory. However, you may find it more convenient to use the spectrum analyzer's front-panel keys to load the personality into memory.

Example

```
10   OUTPUT 718;"IP;SNGLS;"       ! Does an instrument preset and
                                  ! places the spectrum analyzer in the
                                  ! single sweep mode.
20   OUTPUT 718;"TS;"             ! Performs a take sweep.
30   OUTPUT 718;"DONE?;"          ! Queries the spectrum analyzer to
                                  ! return a "1"when the take sweep
                                  ! (TS) command completes.
40   ENTER 718;Done               ! Waits until a "1" is returned.
50   OUTPUT 718;"DISPOSE ALL;"    ! Removes any personalities from
                                  ! spectrum analyzer memory.
60   WAIT 10                      ! Wait for DISPOSE ALL to finish.
70   OUTPUT 718;"LOAD/dGSM/;"     ! Loads the GSM measurements
                                  ! personality into spectrum analyzer
                                  ! memory. "dGSM" is the file name
                                  ! for the GSM measurements
                                  ! personality program.
```

```
80   OUTPUT 718;"TS;"            ! Performs a take sweep.
90   OUTPUT 718;"DONE?;"         ! DONE? returns a “1" when the LOAD
                                 ! and the TS commands are completed.
100  ENTER 718;Done              ! Waits until a “1" is returned.
```

To select the GSM Analyzer mode remotely

1. Prepare the spectrum analyzer for the DONE command by doing an instrument preset and placing the spectrum analyzer into a single sweep mode.
2. Change to the GSM Analyzer mode by setting the value of the MODE command to 10.
3. Perform a take sweep. You must do a take sweep before executing the DONE command.
4. Execute the DONE command.
5. Wait until the DONE command returns a “1."

The spectrum analyzer must be using the GSM Analyzer mode before you can send any GSM programming commands to the spectrum analyzer. You need to execute the DONE command to ensure that the spectrum analyzer has finished executing the MODE command.

Example

```
10   OUTPUT 718;"IP;SNGLS;"      ! Does an instrument preset and
                                 ! places the spectrum analyzer in the
                                 ! single sweep mode.
20   OUTPUT 718;"MODE 10;"       ! Changes to the GSM mode.
30   OUTPUT 718;"TS;"            ! Performs a take sweep.
40   OUTPUT 718;"DONE?;"         ! DONE? returns a “1" when the MODE
                                 ! and take sweep commands are
                                 ! completed.
50   ENTER 718;Done              ! Waits until a “1" is
                                 ! returned.
```

To use an external keyboard to enter commands

1. Turn off the spectrum analyzer.

CAUTION: Do not connect the keyboard to the spectrum analyzer while the spectrum analyzer is turned on.

2. Connect an HP C1405 Option 2 cable from the spectrum analyzer’s rear panel connection (marked EXT KEYBOARD) to the HP C1405 Option ABA keyboard.
3. Press (LINE) to turn on the spectrum analyzer, then press (MODE) **GSM Analyzer**.
4. Press (F8) on the external keyboard to enter the “keyboard to command" mode.

5 Type in the command syntax. The characters that you type are shown at the top of the spectrum analyzer display. You can enter more than one command per line by separating the commands with a semicolon (for example, **IP;SNGLS;**).

6 Press ENTER.

You can enter the programming commands into the spectrum analyzer by using a keyboard that is connected to the spectrum analyzer's external keyboard connector. The external keyboard connector is included with an Option 021 or Option 023 spectrum analyzer. Refer to the documentation for the spectrum analyzer for more information about the different external keyboard functions.

Because you are not using an external computer, the GSM personality and spectrum analyzer commands are entered without an OUTPUT or PRINT statement preceding them.

Example

Type in following programming line. Press ENTER after the programming line has been entered.

```
MOV ng_ARFCN,2;                    ! Changes the channel number to 2.
                                   ! ng_ARFCN is the command for the
                                   ! channel number.
```

Preset States and Default Conditions

Table 1 GSM Measurement Preset States

Preset Values			
	GSM900 (incl R-GSM)	**DCS1800**	**PCS1900**
ARFCN	1	512	512
Bottom ARFCN	1	512	512
Middle ARFCN	62	699	661
Top ARFCN	124	885	810
Start Frequency	920 MHz	1804 MHz	1929 MHz
Stop Frequency	961 MHz	1881 MHz	1991 MHz
Span	41 MHz	77 MHz	62 MHz
Note:	The analyzer presets to the GSM standard in use immediately before initiating PRESET.		
TX MS BS	BS (base station)		
Timeslot Number	0		
Number Bursts	1		
CF Step	200 kHz		
Frequency Offset	0 Hz		
Reference Level	30 dBm + External Attenuation		
Log Scale	10 dB/div		
Amplitude Units	dBm		
Res BW	100 kHz		
Video BW	100 kHz		
Video Averaging	off		
Sweeptime	2 s		
Detector	peak		
Sweep	continuous		
Trigger Mode	free run		
Markers	off		

Table 1 GSM Measurement Preset States

Preset Values	
A – B ⟶ A	off
Trace A	clear-write
Trace B	store-blank
Trace C	store-blank
Threshold Level	off
Display Line Level	off
Limit Line Testing	off
Graticule	on
For HP 8590E Series with Option 163:	
Start bit	0
End bit	147
Graph scale	20°
Measurement calibration	on
Burst type	normal
Color	automatic
Synchronization	midamble
Frequency error offset	0 Hz
Spur Test	off

Table 2 GSM Measurement Default Conditions

GSM Configuration Default Values	
Preamp Gain	0 dB
Trigger Delay	0 µs
Trigger Polarity	positive
External Attenuation	0 dB
SFH	off
Frame Structure	156.25 bits/timeslot
Total Power Mode	Single
Total Power Value	0 dB

Customizing the GSM Personality

The GSM personality uses limits and limit lines when performing the measurements. You can change the values of the limits and limit lines so that the GSM personality performs the measurements according to your particular test situation. For your convenience, you can store the limits and parameters that you have changed on a RAM memory card so the values can be easily loaded into the spectrum analyzer memory, whenever needed. This section contains the following procedures:

- Change the value of limit variables.
- Create a limit line function.
- Changing Output RF spectrum offset values.
- Save the revised limit variables or limit line functions on a RAM card, using an external keyboard.
- Save the revised limit variables or limit line functions on a RAM card, using a computer.
- Modify the default values or limit line functions used by the personality.

To change the value of limit variables

- Use the MOV command to move the new value for a limit into the variable for the limit. or,
- Use the VARDEF command to move the new value for a limit into the variable for the limit. Using VARDEF to move the value for a limit redefines the instrument preset (IP) value of that limit.

The GSM measurements personality uses a “limit" to decide if the measurement results failed or passed. For example, if a signal is above the Rx band spurious limit, the unit under test will fail the Rx band spurious measurement. You can change a limit by changing the value of the limit variable. See Table 3, “Factory Defined Limit Variable Names,” on page 26 for a list of all the limit variables.

If you use the MOV command:

The limit variable will be reset to the default value for the limit variable if an instrument preset (IP) is executed or the spectrum analyzer is turned off.

Example of the MOV command

```
OUTPUT 718;"MOV ngs_XBTA,-33;"    ! Change the limit value from
                                  ! its default of -36 dBm to -33 dBm.
```

If you use the VARDEF command:

The value for the limit variable is retained by the limit variable even if an instrument preset (IP) is executed or the spectrum analyzer is turned off.

Example for the VARDEF command

```
OUTPUT 718;"VARDEF ngs_XBTA,-33;"       ! Change the limit value from
                                        ! its default of -36 dBm
                                        ! to -33 dBm.
```

The VARDEF command changes the GSM measurements personality that is currently in spectrum analyzer memory; the VARDEF command does not change the program on the HP 85715B memory card. If you reload the GSM measurements personality from the HP 85715B memory card, all the limit variables are set to their default values.

Table 3 Factory Defined Limit Variable Names

Measurement	Condition	Variable Name	GSM Default Limit Value	DCS1800 Default Limit Value	PCS1900 Default Limit Value
Frequency Band Limits	Base Station, TX Band Start	ng_BA	921E6 Hz	1805E6 Hz	1930E6 Hz
	Base Station, TX Band End	ng_BB	960E6 Hz	1880E6 Hz	1990E6 Hz
	Mobile Station, TX Band Start	ng_MA	876E6 Hz	1710E6 Hz	1850E6 Hz
	Mobile Station, TX Band End	ng_MB	915E6 Hz	1785E6 Hz	1910E6 Hz
Modulation	Base Station, less than 6 MHz Offset	ng_BSMA	–40 dBm	–57 dBm	–57dBm
	Base Station, greater than 6 MHz Offset	ng_BSMB	–45 dBm	–57 dBm	–57 dBm
	Mobile Station, less than 600 kHz Offset	ng_MSMA	–36 dBm	–36 dBm	–36 dBm
	Mobile Station, Offset 600 kHz up to 1.8 GHz	ng_MSMB	–51 dBm	–56 dBm	–56 dBm
Transients	Base Station, 400 kHz Offset	ng_BSRA	–57 dBc	–50 dBc	–50dBc
	Base Station, 600 kHz Offset	ng_BSRB	–67 dBc	–58 dBc	–58 dBc
	Base Station, 1.2 MHz Offset	ng_BSRC	–74 dBc	–66 dBc	–66 dBc
	Base Station, 1.8 MHz Offset	ng_BSRD	–74 dBc	–66dBc	–66 dBc
	Base Station, Minimum Absolute Limit	ng_BSA	–36 dBm	–36 dBm	–36 dBm
	Mobile Station, RX Band Class 1	ng_MRA	–71 dBm	–79 dBm	–79 dBm
	Mobile Station, RX Band Class 2-5	ng_MRB	–79 dBm	–79 dBm	–79 dBm
	Mobile Station, DCS, RX Band	ng_MRE	–71 dBm	–71 dBm	–71 dBm
PvT	Base Station, Inactive Timeslot	ng_BSIDR	–30 dBc	–30 dBc	–30 dBc
	Base Station, Inactive Timeslot Absolute Limit	ng_BSIDA	None	None	None
	Mobile Station, Inactive Timeslot	ng_MSIDR	–59 dBc	–48 dBc	–48 dBc
	Mobile Station, Inactive Timeslot Absolute Limit	ng_MSIDA	–54 dBm	–48 dBm	–48 dBm
	Mobile Station, Preceding Timeslot Absolute Limit	ng_MSIDP	–36 dBm	–48 dBm	–48 dBm

Table 3 Factory Defined Limit Variable Names

Measurement	Condition	Variable Name	GSM Default Limit Value	DCS1800 Default Limit Value	PCS1900 Default Limit Value
Spurious TX	Base Station, TX and Outside Bands less than 1 GHz	ng_XBTA	–36 dBm	–36 dBm	–36 dBm
	Base Station, Outside Band greater than 1 GHz	ng_XBTB	–30 dBm	–30 dBm	–30 dBm
	Base Station, RX Band*	ng_XBR	–98 dBm*	–98 dBm	–98 dBm
	Base Station, GSM, Other TX Band	ng_OTX	–47 dBm	–57 dBm	–57 dBm
	Mobile Station, TX and Outside Bands less than 1 GHz*	ng_XMTA	–36 dBm*	–36 dBm	–36 dBm
	Mobile Station, Outside Band greater than 1 GHz	ng_XMTB	–30 dBm	–30 dBm	–30 dBm
	Mobile Station, Idle Mode, TX and Outside Bands less than 1 GHz*	ng_XMTIA	–57 dBm*	–57 dBm	–57 dBm
	Mobile Station, Idle Mode, Outside Bands greater than 1 GHz	ng_XMTIB	–47 dBm	–47 dBm	–47 dBm
	Mobile Station, Idle Mode, 880-915 MHz, TX Band	ng_XMTIC	–59 dBm	–59 dBm	–59 dBm
	Mobile Station, Idle Mode, 1710-1785 MHz, TX Band	ng_XMTID	–53 dBm	–53 dBm	–53 dBm
	Mobile Station, Class 1, RX Band	ng_XMRA	–71 dBm	–79 dBm	–79 dBm
	Mobile Station, Class 2-5, RX Band	ng_XMRB	–79 dBm	–79 dBm	–79 dBm
	Mobile Station, Class 1, E-GSM RX Band	ng_XMRC	–59 dBm	–67 dBm	–67 dBm
	Mobile Station, E-GSM RX Band	ng_XMRD	–67 dBm	–67 dBm	–67 dBm
	Mobile Station, DCS RX Band	ng_XMRE	–71 dBm	–71 dBm	–71 dBm
Spurious RX	Base Station, TX and Outside Bands less than 1 GHz	ng_RBTA	–57 dBm	–57 dBm	–57 dBm
	Base Station, Outside Band greater than 1 GHz	ng_RBTB	–47 dBm	–47 dBm	–47 dBm

* The standard limits for GSM900 are used for these variables. If you are making measurements in the R-GSM ARFCN range (955-974) refer to ‘Measurement Limits for R-GSM Channels” on page 28.

Measurement Limits for R-GSM Channels

GSM900 values are used for ARFCN 1-124 and 955-1023. A custom limts file is required if you are making measurements in the R-GSM ARFCN range (955-974) and want to use the limits defined in Specification 5.05 sections 4.3.2 and 4.3.3.

Use the procedures detailed

Table 4 R-GSM Variables

Measurement	Condition	Variable Name	GSM900	R-GSM (MS)	R-GSM (Small MS)
Spurious	Base Station, RX Band	ng_XBR	–98 dBm	–89 dBm	–89 dBm
	Mobile Station, TX and Outside Bands less than 1 GHz	ng_XMTA	–36 dBm	–42 dBm	–42 dBm
	Mobile Station, Idle Mode, TX and Outside Bands less than 1 GHz	ng_XMTIA	–57 dBm	–57 dBm	–51 dBm

Use the values in Table 4 and the procedures detailed in ‘To save limit variables and limit line functions on a RAM card, using an external keyboard” on page 33 or ‘To save limit variables and limit line functions on a RAM card, using a computer” on page 35 to create a custom limits file "dCUST900".
‘To modify the default values or limit line functions used by the personality” on page 37 tells you how to load the custom limits file for use by the GSM Measurement Personality.

NOTE: Once you have set up your custom R-GSM limits file (dCUST900), the GSM Multiband Transmitter Measurement Personality uses these limits for any ARFCN in the range 1-124 and 955-1023.

To create a limit line function

When a measurement is made, the limit line (mask) for that function is automatically drawn on the display. Table 5, “Factory Defined Limit Line Conditions and Function Names,” on page 30 contains the functions that are called by the various measurement commands. Some of these functions provide dynamic limit lines (that is, the limit line levels that are calculated as a function of the measured carrier power level).

Factory defined limit lines can be redefined by downloading program functions into the spectrum analyzer memory. A custom function overwrites the factory defined program function in the spectrum analyzer memory. The factory defined limit line function is restored when the group is reloaded into the spectrum analyzer from the memory card.

1 Use the FUNCDEF command to create a limit line function.

The power versus time burst, power versus time rising edge, and power versus time falling edge measurements each have a specific limit line function definition (FUNCDEF) assigned to the measurement. When you use the FUNCDEF command to create a limit line function, you are actually redefining the existing limit line function that was created by the GSM measurements personality.

2 Use the LIMIDEL command to delete any current limit lines. See the programming documentation for the spectrum analyzer for more information about the LIMIDEL command.

3 Enter the values for the new upper limit line into a trace.

The values must be in display units. With an amplitude scale of 10 dB/div, there are 0 to 8000 display units for the spectrum analyzer display, with 0 representing the bottom graticule and 8000 representing the top graticule. A display unit is equal to 0.01 dB.

4 Move the contents of the trace into the upper limit line with the LIMIHI command.

See the programming documentation for the spectrum analyzer for more information about the LIMIHI command.

5 Repeat step 3, and then move the contents of the trace into the lower limit line with the LIMILO command.

See the programming documentation for the spectrum analyzer for more information about the LIMILO command.

6 Turn on limit line testing with the LIMITEST command.

See the programming documentation for the spectrum analyzer for more information about the LIMITEST command.

7 End the FUNCDEF declaration.

The power versus time burst, power versus time rising edge, and power versus time falling edge measurements use and display an upper and a lower limit line as part of the measurement. You can change the position and shape of these limit lines by creating a limit line function.

Once you have created a limit line function, your limit line function remains in use unless you reload the measurement group into spectrum analyzer memory.

Table 5 Factory Defined Limit Line Conditions and Function Names

Measurement Name	Condition	Function Name
Power vs. Time Frame	148 88 bit burst	ngp_FRLIM
Power vs. Time Timeslot	148 bit burst	ngp_SLIM
Power vs. Time Timeslot	88 bit burst	ngp_SXLIM
Power vs. Time Top 10 dB	148 bit burst	ngp_TPLIM
Power vs. Time Top 10 dB	88 bit burst	ngp_TPXLIM
Power vs. Time Rising	148 88 bit burst	ngp_RLIM
Power vs. Time Falling	148 bit burst	ngp_FLIM
Power vs. Time Falling	88 bit burst	ngp_FXLIM
RF Spectrum Modulation	MS	ngos_MMLIM
RF Spectrum Modulation	BS	ngos_MBLIM
RF Spectrum Modulation RX Band	MS	ngos_MRXLIM
RF Spectrum Modulation RX Band	BS	ngos_BRXLIM
RF Spectrum Transient	MS	ngos_XMLIM
RF Spectrum Transient	BS	ngos_XBLIM

Example 1

The following example shows you how you can create a limit line function for changing the limit lines that are used in the power versus time rising measurement.

```
10   ! GSM Power vs. Time Rising edge Limits
20   !
30   ! Notes:
40   ! Horizontal: trace elements go from 1 thru 401.
50   ! Vertical:  100 display units/dB, Ref Lvl = 8000
60   ! The mean of the burst is positioned 2dB below Ref Lvl =7800.
70   ! Swp Time = 80 us, gives 0.2 us per trace element.
80   !
90   !
100   OUTPUT @Sa;"FUNCDEF ngp_RLIM,@";         ! limit line function
110   OUTPUT @Sa;"LIMIDEL;";                   ! name delete existing
120                                            ! limit lines
130  !
140  ! upper limit line
150  !calc vert position for absolute limit line segment.
160   OUTPUT @Sa;"{_X=8000-3200};";            ! calculate dynamic
170                                            ! position 30 dB below
180                                            ! signal level
190                                            ! draw upper limit
200                                            ! line in Trace A, then
210                                            ! transfer to Limit
220                                            ! Line Hi
230  !
240  OUTPUT @Sa;"MOV TRA[1,150],_X;";          ! 1st horiz seg,
250                                            ! calculated _X
260  OUTPUT @Sa;"MOV TRA[151,401],8030;";! 2nd horiz seg, mean+2.3 dB
270  OUTPUT @Sa;"LIMIHI TRA;";                 ! transfer TRA to
280                                            ! LIMIHI
290  !
300  ! lower limit line
310  ! draw lower limit line in Trace A, then transfer to
320  ! Limit Line Lo
330  OUTPUT @Sa;"MOV TRA[1,240],-8000;";       ! 1st horiz seg, off
340                                            ! screen
350  OUTPUT @Sa;"MOV TRA[241,401],5800;";      ! 2nd horiz seg,
360                                            ! mean-20 dB
370  OUTPUT @Sa;"LIMILO TRA;";                 ! transfer TRA to
380                                            ! LIMILO
390  OUTPUT @Sa;"LIMITEST1;";                  ! turn on Limit Test
400  OUTPUT @Sa;"@;";
```

Changing Output RF Spectrum Offset Values

The list of offset frequencies used for the Output RF Spectrum, Multiple Mode measurements is contained in the function ngos_OFS. This function needs to contain the two statements provided below, which place the frequency offset values into two single-dimension arrays (traces).

Output RF Spectrum Modulation Offset List

```
ng_MOFST < number, number, ..... number >;
< number >  integer from 0 through 32767
Units in kHz
```

Output RF Spectrum Transient Offset List

```
ng_TOFST < number, number, ..... number >;
< number >  integer from 0 through 32767
Units in kHz
```

For each offset number in the following lists, two measurements are made. One at the negative (–) frequency offset, and the other at the positive (+) frequency offset. The maximum number of offsets in the list is 16. The end of the list is marked using a value of 0. The reference measurement at 0 offset is always made and does not need to be specified in the list.

The following example is the function as defined in the GSM Transmitter Measurements Personality.

`FUNCDEF ngos_OFS,@`	*Define the function ngos_OFS*
`ngos_MOFST 100,200,250,400,600,800,` `1000,1200,1400,1600,1800,0;`	*Place the offset values into trace ngos_MOFST for modulation multiple measurement*
`ngos_TOFST 400,600,1200,1800,0;`	*Place the offset values into trace ngos_TOFST for transient multiple measurement.*
`@;`	*End of function.*

To save limit variables and limit line functions on a RAM card, using an external keyboard

1 Refer to your Spectrum Analyzer User's Guide for information about connecting an external keyboard to the spectrum analyzer.

2 Delete the current version of the GSM personality and any other downloadable programs from analyzer memory by pressing (CONFIG), **More 1 of 3**, **Dispose User Mem**, **ERASE DLP MEM**, **ERASE DLP MEM**.

3 Insert a RAM card into the analyzer's front-panel memory card reader. Ensure that the RAM card is not write-protected (the switch on the RAM card should be set to the read/write ↔ position).

4 Type in the programming statements that define the limit variable or limit line function.

- For a limit variable, type in "VARDEF," the name of the variable (see Table 3, "Factory Defined Limit Variable Names," on page 26 for a complete list of limit variables), a comma, and the value you want for the limit. Repeat this step for each limit you want to define.
- For a limit line function, create the limit line function. (See To create a limit line function for information about how to create a limit line function, but do not use the OUTPUT or PRINT statements to send the commands to the spectrum analyzer.) Repeat this step for each limit line function that you want to define.

5 Type in "STOR d,'dLIMIT1',*;" to store all the newly defined limits and limit line functions on the memory card. The limits and limit line functions will be stored in a file called "dLIMIT1".

6 Load the personality into spectrum analyzer memory. Switch to the GSM personality by pressing (MODE), **GSM Analyzer**.

7 Remove the GSM memory card from the memory card reader and insert the RAM card (with the dLIMIT1 file on it) into the memory card reader.

8 Load the dLIMIT1 file into spectrum analyzer memory by pressing (RECALL), **Catalog Card**, **More 1 of 2**, **CATALOG DLP**. If necessary, turn the large knob on the spectrum analyzer's front panel until "dLIMIT1" is highlighted. Press **LOAD FILE**.

When you load the GSM measurements personality, the measurements personality uses default values for the limits and limit line functions. If you then load the dLIMIT1 file into spectrum analyzer memory, the personality will use the revised limit values or limit line function. The revised values will remain in spectrum analyzer memory until the analyzer memory is erased, or the personality is reloaded from the memory card.

NOTE: Limit line functions will be overwritten when a measurement group is loaded or re-loaded. To overcome this, either follow step 8 again or see 'To modify the default values or limit line functions used by the personality" on page 37.

Example

Use an external keyboard to enter in the following command example lines. Press ENTER after each line:

```
VARDEF ngs_XBTA,-38;
VARDEF ngs_XBTB,-32;
STOR d,'dLIMIT1',*;
```

The previous command lines will change the Base Station Spurious Limit (≤1 GHz) to –38 dBm, (>1 GHz) to –32 dBm. The last line stores these limits on a RAM card with the file name "dLIMIT1."

To save limit variables and limit line functions on a RAM card, using a computer

1 Insert a RAM card into the analyzer's front-panel memory card reader. Ensure that the RAM card is not write-protected (the switch on the RAM card should be set to the read/write (↔ position).

2 Delete the current version of the GSM personality and any other downloadable programs from analyzer memory with the DISPOSE ALL command.

3 Type in the programming statements that define the limit, parameter, or limit line function.

- For a limit variable, use an OUTPUT or PRINT command to send the spectrum analyzer command VARDEF (defines the limit variable) and the limit variable name. See Table 3, "Factory Defined Limit Variable Names," on page 26 for a complete list of limit variables. Repeat this step for each variable you want to define.
- For a limit line function, create the limit line function. (See 'To create a limit line function" on page 29 for information.) Repeat this step for each limit line function that you want to define.

4 Use an OUTPUT or PRINT command to send the STOR spectrum analyzer command. Use "STOR d,'dLIMIT1',*;" to store the newly defined variables or limit line functions on the memory card. The variables and limit line function will be stored in a file called "dLIMIT1."

5 Load the personality into spectrum analyzer memory.

6 Remove the GSM memory card from the memory card reader and insert the RAM card (with the dLIMIT1 file on it) into the memory card reader.

7 Load the dLIMIT1 file into spectrum analyzer memory. You can load the dLIMIT1 file by pressing (RECALL), **Catalog Card**, **More 1 of 2**, **CATALOG DLP**. If necessary, turn the large knob on the spectrum analyzer's front panel until "dLIMIT1" is highlighted. Press **LOAD FILE**. Switch to the GSM personality by sending **"MODE 10"** or pressing (MODE), **GSM Analyzer**. Or, Use the LOAD command to load the dLIMIT1 file. For example, execute **OUTPUT 718;"LOAD dLIMIT1;"**.

When you load the GSM measurements personality, the measurements personality uses default values for the limit variables and the limit line functions. If you then load the dLIMIT1 file into spectrum analyzer memory, the personality will use the revised limit or parameter values or limit line functions. The revised values or limit line functions will remain in spectrum analyzer memory until the analyzer memory is erased, or the personality is reloaded from the memory card.

NOTE: Limit line functions will be overwritten when a measurement group is loaded or re-loaded. To overcome this, either follow step 7 again or see “Modify the default values or limit line functions used by the personality" in this chapter.

Any number of custom limit files may be created and stored on a memory card as long as each file has a unique file name, and there is enough space on the RAM card to store the files.

Example

```
10   ! re-store “LIMIT1_EX"
20   ! Shows how to save custom measurement limits to card for the DLP.
30   ! This card file can then be loaded after loading GSM.
40    ASSIGN @Sa TO 718                ! i/o path to spectrum
50                                     ! analyzer
60    OUTPUT @Sa;"IP;SNGLS;"
70    OUTPUT @Sa;"TS;DONE?"
80    ENTER @Sa;Done
90    OUTPUT @Sa;"DISPOSE ALL;"        ! make sure all DLPs erased.
100    WAIT 10                         ! wait for dispose to finish.
110   OUTPUT @Sa;"VARDEF ngs_XBTA,-38;" ! change carrier pwr high
120                                    ! limit to  -38 dBm
130   OUTPUT @Sa;"VARDEF ngs_XBTB,-32;" ! change carrier pwr low limit
140                                    ! to  -32 dBm
150   OUTPUT @Sa;"STOR d,’dLIMIT1’,*;"  ! store to RAM memory card
160   OUTPUT @Sa;"CONTS;"              ! continuous sweep
170   DISP "DONE"
180  END
```

To modify the default values or limit line functions used by the personality

- Create a custom limits file on a RAM card as described earlier. For example **"dLIMIT1"**.

- Delete the current version of the GSM personality and any other downloadable programs from analyzer memory by pressing (CONFIG), **More 1 of 3**, **Dispose User Mem**, **ERASE DLP MEM** , **ERASE DLP MEM** .
- Load the dLIMIT1 file into spectrum analyzer memory by pressing (RECALL), **Catalog Card**, **More 1 of 2**, **CATALOG DLP**. If necessary, turn the large knob on the spectrum analyzer's front panel until "dLIMIT1" is highlighted. Press **LOAD FILE** .
- Insert the RAM card containing the GSM personality into the analyzer's front-panel memory card reader. Ensure that the RAM card is not write-protected (the switch on the RAM card should be set to the read/write (↔) position).
- Type in
  "STOR d,'dCUST900',*;"
  "STOR d,'dCUST1800',*;"
  "STOR d,'dCUST1900',*;"
  to create a new custom limits file which is used whenever either the
  GSM900
  DCS1800
  PCS1900
  modes are selected (respectively), or a new personality group is loaded from the card.

Syntax Conventions

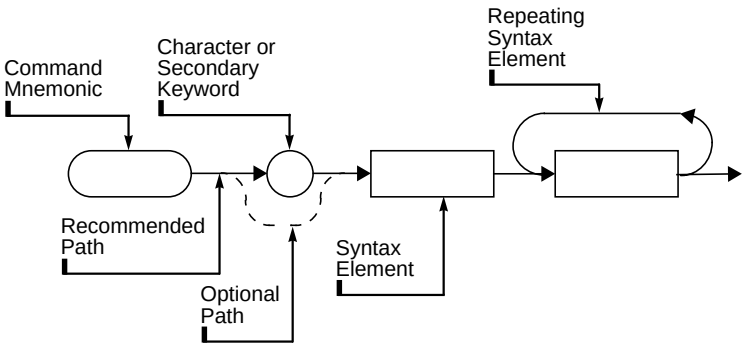


Figure 1 Pictorial Command Syntax Conventions

Command mnemonics are shown within ovals. The command mnemonic must be entered exactly as shown.

Syntax elements are shown within rectangles.

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.

- Curved intersections indicate command path direction.

Semicolons or question marks are the required command terminators. Question marks do not need to be followed with a semicolon. However, using semicolons makes programs easier to read, prevents command misinterpretation, and is recommended by IEEE Standard 728.

NOTE: You may use either upper-case or lower-case letters for any command mnemonic.

Table 6 Syntax Elements

Syntax Component	Definition or Range
GSM remote command	Any command in this chapter, using the required syntax.
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 data byte, and S_P indicates a blank space.
character & EOI	8-bit byte containing character data only, followed by end-or-identify (EOI) condition, where the EOI control line on HP-IB is asserted to indicate the end of the transmission. END signifies the EOI condition.
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 HP-IB 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 user-defined functions or 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 Digit is a subset of character.
number	Expressed as integer, decimal, or in exponential (E) form. The allowed real-number range is typically command dependent. Integer Number Range: –32,768 through +32,767
output termination	Carriage return (C_R) and line feed (L_F) with end-or-identify (EOI) condition. ASCII codes 13 (carriage return) and 10 (line feed) are sent via HP-IB, then the end-or-identify control line on HP-IB sets to indicate the end of the transmission.
string	A delimited sequence of zero or more characters.
units	Represent standard scientific units. Frequency Units: GHZ or GZ, MHZ or MZ, KHZ or KZ, HZ Amplitude Units: DB, DBM, DM, DBMV, DBUV, V, MV, UV, W, MW, UW Time Units: SC, MS, US Phase Angle Units: DEG

Using the Functional Index Table

The following table lists GSM Transmitter Measurements Personality softkeys beside their related remote command. Some remote commands need more than one command to produce the effect of a related softkey.

In the table, multiple commands are listed with semicolons between the command names. Use the semicolon to delimit the multiple command string.

Table 7 Functional Index

GSM Softkey	Corresponding Remote Command Sequence
ng Group – Configuration, Physical Channel, Carrier Power, and Monitor TX Band Commands	
156.25 157/156	ng_FRMS;
512-810 DCS PCS	ng_MIDBAND;
ARFCN	ng_ARFCN;
AUTO TN	ng_ATN;
AUTO ARFCN	ng_AA;
AUTO ARFCNTN	ng_AATN;
BITS 88 148	ng_BURST;
CARRIER OFFSET	ng_COFST;
CARRIER POWER	ng_CPS;ng_CPM;
DEFAULT CONFIG	ng_DEFAULT;
DISPOSE GSM	ng_DISPOSE;
EXT ATTEN	ng_EXTATN;
MEASURE AVG PKS	ng_PKAVG;
MONITOR TX BAND	ng_MBS;ng_MBM;
MS CLASS 1 2-5	ng_MSCL;
NUMBER BURSTS	ng_NB;

Table 7 Functional Index

GSM Softkey	Corresponding Remote Command Sequence
ng Group – Configuration, Physical Channel, Carrier Power, and Monitor TX Band Commands (continued)	
PREAMP GAIN	ng_PREAMPG;
PRESET GSM	ng_MP;
REPEAT MEAS	ng_RPT;
SFH ON OFF	ng_SFH;
TIMESLOT NUMBER	ng_TN;
TOTL PWR SGL MULT	ng_TPMODE; *or* ng_TOTPWR;
TRIG DELAY	ng_TRIGD;
TRIG POL NEG POS	ng_TRIGP;
TX MS BS	ng_BSMS;
ngp Group – Power Steps and Power vs. Time (Command: ng_GROUP 1)	
COMBINER TUNING	ngp_CTS;ngp_CTM;
POWER STEPS	ngp_STEPS;ngp_STEPM;
P vs T FALLING	ngp_FS;ngp_FM; *
P vs T FRAME	ngp_FRS;ngp_FRM;
P vs T RISING	ngp_RS;ngp_RM; *
P vs T SUB TS	ngp_SSS;ngp_SSM;
P vs T TIMESLOT	ngp_SS;ngp_SM;
P vs T TOP 10dB	ngp_TPS;ngp_TPM; *
* The power vs. time falling edge, rising edge, and Top 10 dB measurements must be preceded by the P vs T SUB TS commands.	

Table 7 Functional Index

GSM Softkey	Corresponding Remote Command Sequence
ngos Group – Output RF Spectrum (Command:ng_GROUP 2)	
MODULAT RX BAND	ngos_MRXS;ngos_MRXM;
MODULAT SWEEP	ngos_MODE0;ngos_MS;ngos_MM;
MODULAT SINGLE	ngos_MODE2;ngos_MS;ngos_MM;
MODULAT MULTIPLE	ngos_MODE1;ngos_MS;ngos_MM;
TRANSNT SWEPT	ngos_MODE0;ngos_XS;ngos_XM;
TRANSNT SINGLE	ngos_MODE2;ngos_XS;ngos_XM;
TRANSNT MULTIPLE	ngos_MODE1;ngos_XS;ngos_XM;
ngs Group – Spurious Emissions (Command:ng_GROUP 3)	
IDL YES NO	ngs_IDLEF;
MAXIMUM RES BW	ngs_MAXRBW;
NUMBER SWEEPS	ngs_NUMBSWPS;
OUTSIDE TX RX (for Transmitter Spurious Emissions)	ngs_RCVRF0;ngs_MEASOUT;
OUTSIDE TX BAND (for Receiver Spurious Emissions)	ngs_RCVRF1;ngs_MEASOUT;
RX BAND (for Transmitter Spurious Emissions)	ngs_MEASRX
SPUR TST ON OFF	ngs_TSTF
TX BAND (for Transmitter Spurious Emissions)	ngs_RCVRF0;ngs_MEASTX;
TX BAND (for Receiver Spurious Emissions)	ngs_RCVRF1;ngs_MEASTX;

Table 7 Functional Index

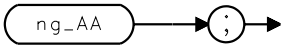
GSM Softkey	Corresponding Remote Command Sequence
ngi Group – Intermodulation Attenuation (Command: ng_GROUP 4)	
REF CHANNEL	ngi_REFCH;
RX BAND (Intra-BSS Intermodulation)	ngi_INTRARX;
TX BAND (Intra-BSS Intermodulation)	ngi_INTRATX;
ngd Group – Demodulation (Phase and Frequency Error) (Command: ng_GROUP 5) (Spectrum analyzer option 163 required.)	
COLOR AUTO MAN	ngd_AC; *or* ngd_COL;
DATA BITS	ngd_DBS;ngd_MEAS;
END BIT	ngd_END;
FREQ DEV GRAPH	ngd_FGS;ngd_MEAS;
FREQ ERR OFFSET	ngd_FOST;
MEAS CAL ON OFF	ngd_MCAL;
PHASE & FRQ GRAPH	ngd_PFG;ngd_MEAS;
PHASE FREQ	ngd_PFS;ngd_MEAS;
PHASE GRAPH	ngd_PGS;ngd_MEAS;
SCALE	ngd_SCALE;
START BIT	ngd_START;
STD DEV ON OFF	ngd_STDEV;
SYNC MID AMPL	ngd_SYNC;

ng_AA

Automatic ARFCN

The ng_AA command automatically sets the absolute RF channel number (ARFCN) to the channel having the maximum signal level.

Syntax



Description

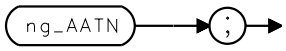
The ng_AA command is equivalent to pressing the **AUTO ARFCN** key.

ng_AATN

Automatic ARFCN and Timeslot Number

The ng_AATN command automatically sets both the absolute RF channel number (ARFCN) and the timeslot number. The command sets the ARFCN to the RF channel with the maximum signal level, then sets the timeslot to the one with the maximum signal level for the selected ARFCN.

Syntax



Description

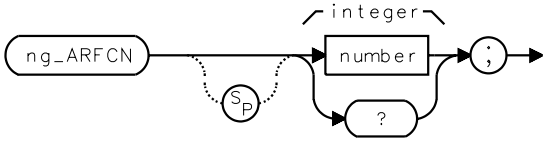
The ng_AATN command is equivalent to pressing the **AUTO ARFCN&TN** key.

ng_ARFCN

Absolute RF Channel Number

The ng_ARFCN command selects the RF Channel to be measured. The center frequency of the spectrum analyzer is tuned to the center frequency of the selected RF channel for channel measurements such as Carrier Power, Power Steps, Power vs. Time, and Output RF Spectrum. In other words, the ARFCN is only coupled to the center frequency for channel measurements.

Syntax



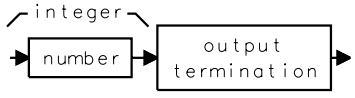
Item	Description	Range
number	A valid integer within the specified range.	-1, 0 through 124, 512 through 885 and 955 through 1023.

Description

The ng_ARFCN command is equivalent to pressing the **ARFCN** key.

Setting a value of -1 is equivalent to pressing the **ARFCN** key and using the data keys to enter -1. Specify the RF Frequency using ng_CFA.

Query Response

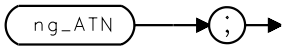


ng_ATN

Automatic Timeslot Number

The ng_ATN command automatically sets the timeslot to the one with the maximum signal level for the selected ARFCN.

Syntax



Description

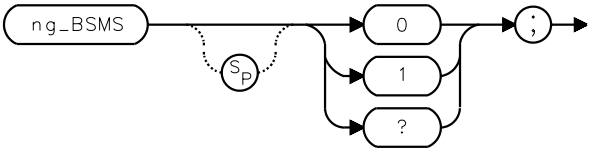
The ng_ATN command is equivalent to pressing the **AUTO TN** key.

ng_BSMS

Base Station and Mobile Station Selector

The ng_BSMS command sets the spectrum analyzer frequency to be in either the base station or mobile station transmit band. The setting also serves as a flag for measurements which differ between base and mobile station testing.

Syntax

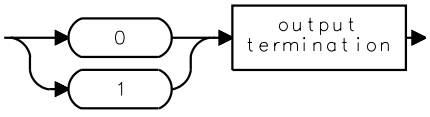


Item	Description
0	Base Station transmit band.
1	Mobile Station transmit band.

Description

The ng_BSMS command is equivalent to pressing the **TX MS BS** key.

Query Response

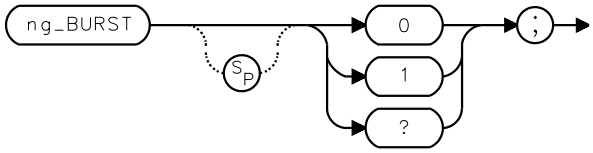


ng_BURST

Burst Type

The ng_BURST command selects the type of burst to use for measurements.

Syntax

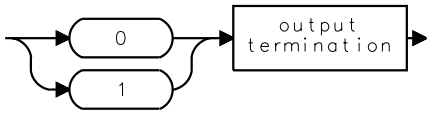


Item	Description
0	An 148-bit burst
1	An 88-bit burst (access burst for mobile station testing)

Description

The ng_BURST command is equivalent to pressing the **BITS 88 148** or **Burst Type** keys.

Query Response

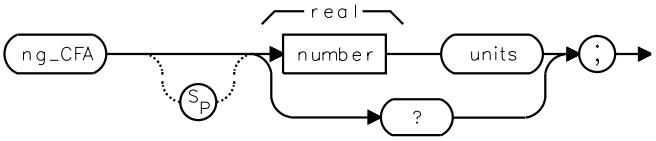


ng_CFA

Center Frequency for ARFCN-1

The ng_CFA command specifies the RF Frequency of the channel to be measured when you have specified an ng_ARFCN value of -1 (user defined channel) and want to repeat a measurement at a different channel frequency.

Syntax

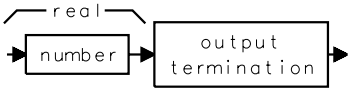


Item	Description	Range
number	Any real number within the specified range. Default unit is Hz.	Frequency range of the spectrum analyzer.

Description

The ng_CFA command is equivalent to pressing the **CTR FREQ ARFCN=-1** key.

Query Response

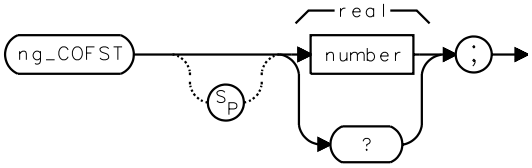


ng_COFST

Carrier Offset

The ng_COFST command sets the spectrum analyzer center frequency to the center of the RF channel frequency plus the carrier offset.

Syntax

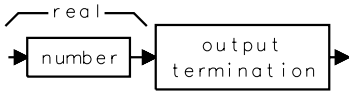


Item	Description	Range
number	A real number within the specified range.	–10E8 Hz to 10E8 Hz

Description

The ng_COFST command is equivalent to pressing the **CARRIER OFFSET** key.

Query Response

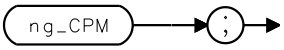


ng_CPM

Carrier Power Measurement

The ng_CPM command starts the Carrier Power measurement. Refer to the Measurement Results table below for the variable or trace name that contains the measurement results.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement completed; no carrier found.	
ng_CPA	Contains Carrier Power measurement results.	dBm
TRA	Contains power waveform.	dBm

Description

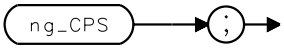
The ng_CPS command followed by the ng_CPM command is equivalent to pressing the **CARRIER POWER** key.

ng_CPS

Carrier Power Measurement Setup

The ng_CPS command sets the spectrum analyzer parameters to make the Carrier Power measurement.

Syntax



Description

The ng_CPS command followed by the ng_CPM command is equivalent to pressing the **CARRIER POWER** key.

ng_DEFAULT

Default Configuration

The ng_DEFAULT command sets all parameters located in the Configuration menu to their default states. The configuration parameters are not modified or lost as a result of pressing PRESET or cycling the spectrum analyzer's power.

Syntax

Description

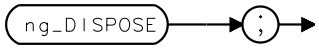
The ng_DEFAULT command is equivalent to pressing the **DEFAULT CONFIG** key. Refer to Table 1, "GSM Measurement Preset States," on page 22 for a list of the default settings.

ng_DISPOSE

Dispose GSM

The ng_DISPOSE command erases the GSM Transmitter Measurements Personality from spectrum analyzer memory. Other downloaded functions in spectrum analyzer memory are not erased or changed.

Syntax



Description

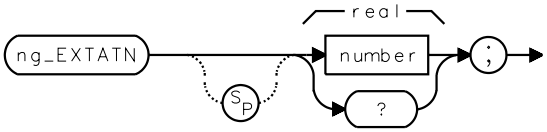
The ng_DISPOSE command is equivalent to pressing the **DISPOSE GSM** key.

ng_EXTATN

External Attenuation

The ng_EXTATN command allows you to enter the value of the external attenuation between the transmitter output and the RF INPUT of the spectrum analyzer.

Syntax

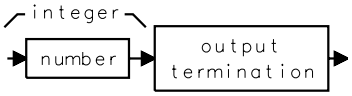


Item	Description	Range
number	Any real number within the specified range.	0 dB through60 dB

Description

The ng_EXTATN command is equivalent to pressing the **EXT ATTEN** key.

Query Response

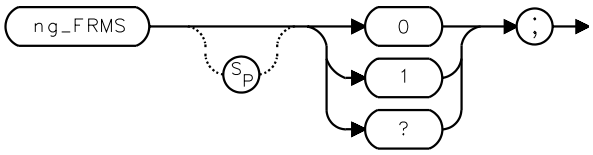


ng_FRMS

Frame Structure

The ng_FRMS command selects the type of frame structure to use during some of the GSM measurements.

Syntax

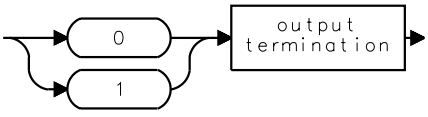


Item	Description
0	A 156.25-bit burst in all timeslots.
1	A 157-bit burst in timeslots 0 and 4, and a 156-bit burst in timeslots 1, 2, 3, 5, 6, and 7.

Description

The ng_FRMS command is equivalent to pressing the **`156.25 157/156`** key.

Query Response

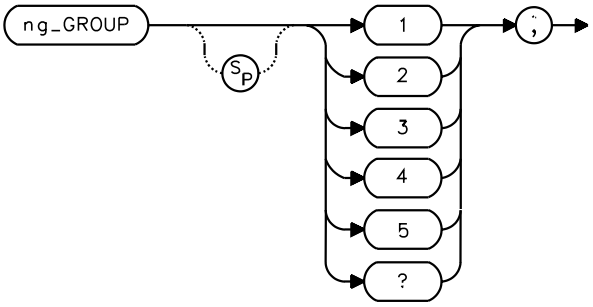


ng_GROUP

Select GSM Measurement Group

The ng_GROUP command first clears the spectrum analyzer's memory of any previously stored GSM measurement groups. Next, the command loads the new measurement group and all related softkeys and menus into the spectrum analyzer's memory.

Syntax



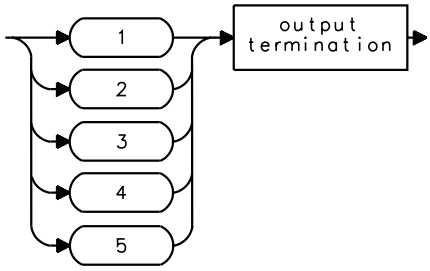
Item	Description
1	Power Step and Power vs. Time measurement group (ngp_ prefix)
2	Output RF Spectrum measurement group (ngos_ prefix)
3	Spurious measurement group (ngs_ prefix)
4	Intermod measurement group (ngi_ prefix)
5	Phase and Frequency Error measurement group (ngd_ prefix) (Spectrum analyzer option 163 required.)

Description

A group must be loaded into the spectrum analyzer memory before sending any GSM Transmitter Measurements Personality remote commands that belong to that group.

Variable or Trace	Description of Contents
ng_OK = 0	No memory card or wrong memory card detected.
ng_OK = 1	Correct memory card detected.

Query Response

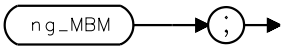


ng_MBM

Monitor TX Band Power Measurement

The ng_MBM command starts the Monitor TX Band Power measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
ng_TPWRV	Contains the total power measured in TX band.	dBm
TRA	Contains the TX band spectrum.	dBm

Description

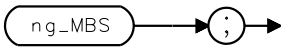
The ng_MBS command followed by the ng_MBM command is equivalent to pressing the **MONITOR TX BAND** key.

ng_MBS

Monitor TX Band Power Measurement Setup

The ng_MBS command sets the spectrum analyzer parameters to make the Monitor TX Band Power measurement.

Syntax



Description

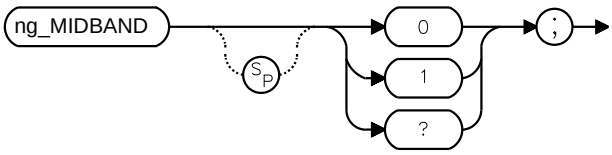
The ng_MBS command followed by the ng_MBM command is equivalent to pressing the **MONITOR TX BAND** key.

ng_MIDBAND

Select DCS1800 or PCS1900

ARFCNs in the range 512-810 are shared by both DCS1800 and PCS1900. The ng_MIDBAND command enables automatic selection of the required standard when an ARFCN in the range 512-810 is entered.

Syntax

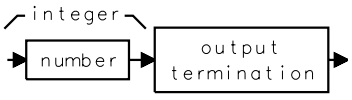


Item	Description
0	Enables automatic selection of DCS1800 mode when an ARFCN in the range 512 - 810 is selected.
1	Enables automatic selection of PCS1900 mode when an ARFCN in the range 512 - 810 is selected.

Description

Using the ng_MIDBAND command is equivalent to selecting DCS1800 or PCS1900 by pressing the **512-810 DCS PCS** key.

Query Response

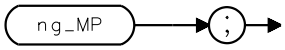


ng_MP

Mode Preset

The ng_MP command presets the GSM Analyzer parameters to their initial states. Only the GSM mode is affected.

Syntax



Description

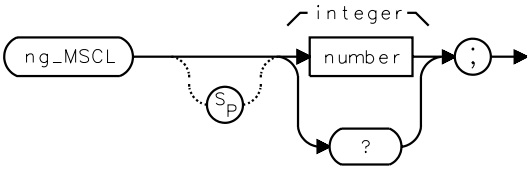
The ng_MP command is equivalent to pressing the **PRESET GSM** key. Refer to Table 1, “GSM Measurement Preset States,” on page 22 for the GSM measurement preset states.

ng_MSCL

Mobile Station Class

The ng_MSCL command specifies the class of the mobile station being measured. The class selection sets the proper limits for the measurement.

Syntax

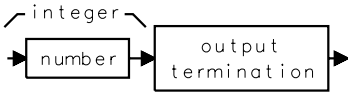


Item	Description
1	The measurement limits for class 1 mobile station.
2	The measurement limits for class 2 mobile station.
3	The measurement limits for class 3 mobile station.
4	The measurement limits for class 4 mobile station.
5	The measurement limits for class 5 mobile station.

Description

The ng_MSCL command is equivalent to pressing the **MS CLASS 1 2-5** key.

Query Response

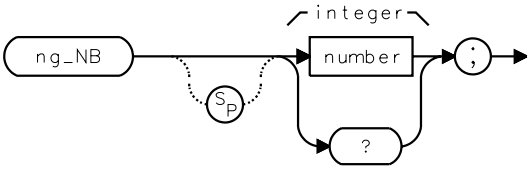


ng_NB

Number of Bursts

The ng_NB command allows you to enter the number of bursts to use for GSM measurements.

Syntax

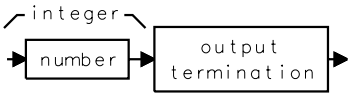


Item	Description	Range
number	An integer within the specified range.	1 through 2,000

Description

The ng_NB command is equivalent to pressing the **NUMBER BURSTS** key.

Query Response

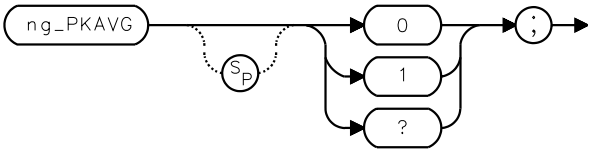


ng_PKAVG

Peak Average

The ng_PKAVG command selects either an average measurement or a maximum/ minimum peak measurement for the Power vs. Time or Phase and Frequency Error measurements.

Syntax

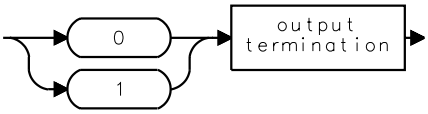


Item	Description
0	The maximum/minimum peak measurement mode.
1	The average measurement mode.

Description

The ng_PKAVG command is equivalent to pressing the **MEASURE AVG PKS** key.

Query Response

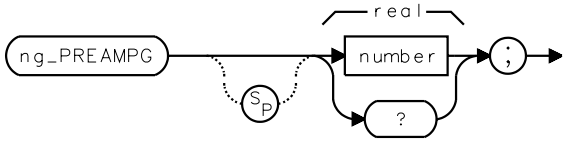


ng_PREAMPG

Preamplifier Gain

The ng_PREAMPG command allows entry of the combined preamplifier gain, bandpass filter insertion loss, and any known cable loss values into the program. The value is used during the Spurious, Intermod, and Output RF Spectrum measurements of the RX band.

Syntax

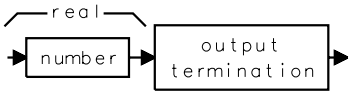


Item	Description	Range
number	Any real number within the specified range.	–20 through 50 dB

Description

The ng_PREAMPG command is equivalent to pressing the **PREAMP GAIN** key.

Query Response

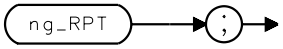


ng_RPT

Repeat Measurement

The ng_RPT command allows you to repeat the last-performed measurement, without having to re-do a measurement setup command.

Syntax



Description

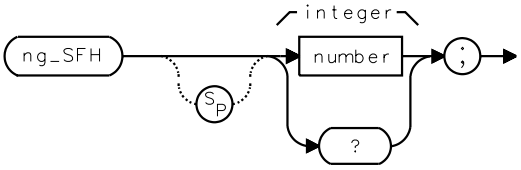
The ng_RPT command is equivalent to pressing the **REPEAT MEAS** key.

ng_SFH

Slow Frequency Hopping Repetition Factor

The ng_SFH command enables or disables the slow frequency hopping mode. The command also allows you to enter the SFH repetition factor.

Syntax

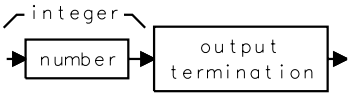


Item	Description
number	An integer whose value equals the SFH repetition factor.
1	Slow frequency hopping disabled. Repetition factor is 1.
2 – 100	Slow frequency hopping enabled. Repetition factor equals integer between 2 and 100.

Description

The ng_SFH command is equivalent to pressing the **SFH ON OFF** key.

Query Response

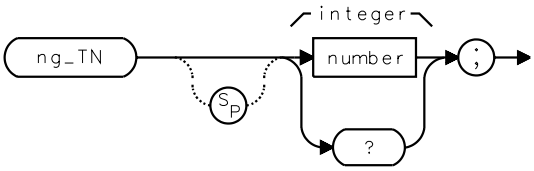


ng_TN

Timeslot Number

The ng_TN command selects the timeslot to be measured. The correct time parameters are set for channel measurements. These measurements include the Carrier Power, Power Steps, Power vs. Time, Output RF Spectrum, and Phase and Frequency Error measurements.

Syntax

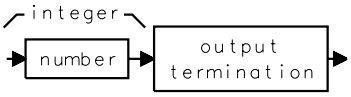


Item	Description	Range
number	An integer within the specified range.	0 through 7

Description

The ng_TN command is equivalent to pressing the **TIMESLOT NUMBER** key.

Query Response

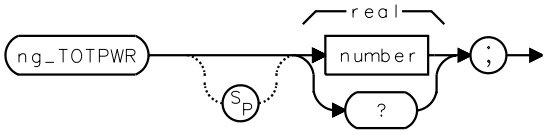


ng_TOTPWR

Total Power

The ng_TOTPWR command allows you to enter the total power used for multiple-carrier power mode.

Syntax

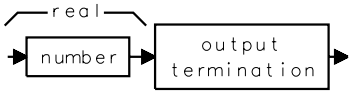


Item	Description	Range
number	A real number within the specified range.	0 through 50dBm

Description

The ng_TOTPWR command is equivalent to entering a value with **TOTL PWR** key.

Query Response

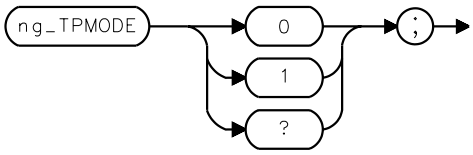


ng_TPMODE

Total Power Mode

The ng_TPMODE command selects either single-carrier or multiple-carrier power mode.

Syntax

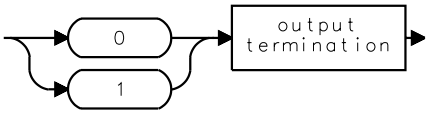


Item	Description
0	The single-carrier power mode.
1	The multiple-carrier power mode.

Description

The ng_TPMODE command is equivalent to pressing the **TOTL PWR SGL MULT** key.

Query Response

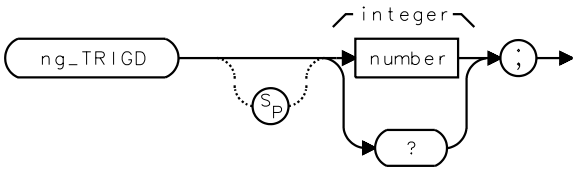


ng_TRIGD

Trigger Delay

The ng_TRIGD command sets the value of the trigger delay with respect to the external frame trigger signal. A trigger delay value of 0 places the trigger point at the start of bit 0 in timeslot 0.

Syntax

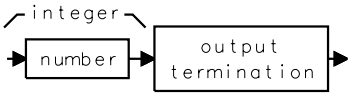


Item	Description	Range
number	A valid integer within the range specified.	–4680 through 250 µs

Description

The ng_TRIGD command is equivalent to pressing the **TRIG DELAY** key.

Query Response

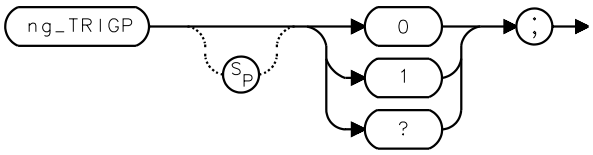


ng_TRIGP

Trigger Polarity

The ng_TRIGP command selects either positive-edge trigger mode or negative-edge trigger mode for the external frame trigger signal.

Syntax

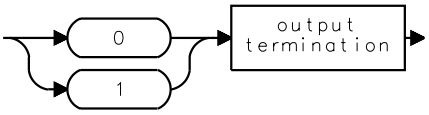


Item	Description
0	The negative-edge trigger mode.
1	The positive-edge trigger mode.

Description

The ng_TRIGP command is equivalent to pressing the **TRIG POL NEG POS** key.

Query Response



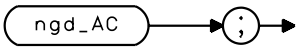
ngd_AC

Automatic Color Selection

Spectrum analyzer option 163 required

The ngd_AC command automatically selects the color pattern sent by the transmitter.

Syntax



Description

The ngd_AC command is equivalent to pressing the **COLOR AUTO MAN** key until AUTO is underlined.

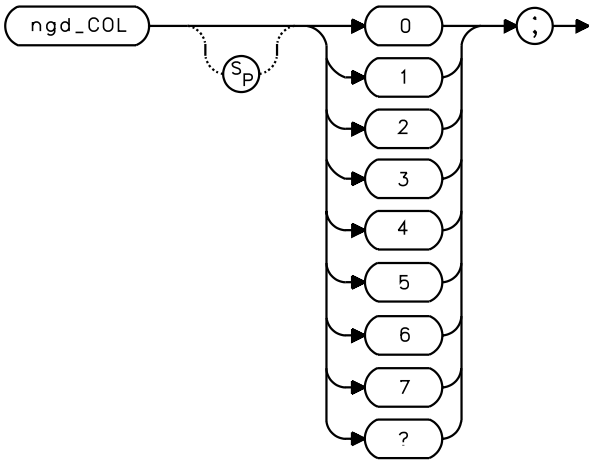
ngd_COL

Color Code Selection

Spectrum analyzer option 163 required

The ngd_COL command allows you to set the expected color code sent by the transmitter. This determines the expected midamble bit sequence, and must be correctly set to avoid error bits being reported.

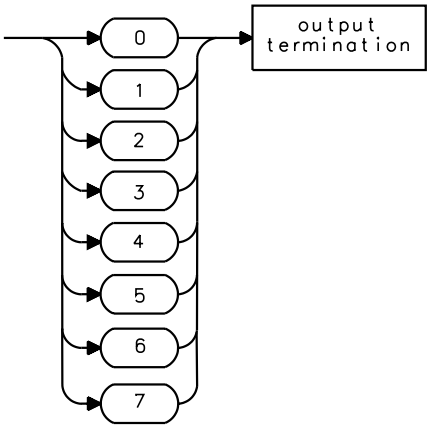
Syntax



Description

The ngd_COL command is equivalent to pressing the **COLOR AUTO MAN** key until MAN is underlined. The color codes range from 0 through 7 therefore a value in this range can be entered.

Query Response



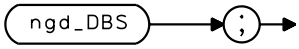
ngd_DBS

Data Bits Setup

Spectrum analyzer option 163 required

The ngd_DBS command performs the setup for the data bits measurement.

Syntax



Description

The ngd_DBS command followed by the ngd_MEAS command is equivalent to pressing the **DATA BITS** key.

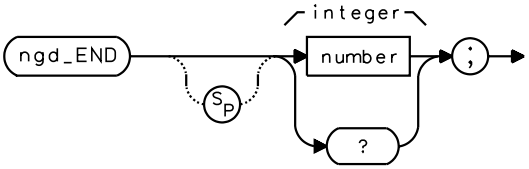
ngd_END

End Bit Number for Graph Display

Spectrum analyzer option 163 required

The ngd_END command allows you to enter the value of the last bit number in the burst you require on the graph display. This command is used in conjunction with ngd_START.

Syntax



Item	Description	Range
number	A valid integer within the range specified.	0 through 147

Description

The ngd_END command is equivalent to pressing the **END BIT** key.

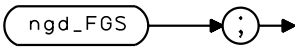
ngd_FGS

Frequency Deviation Graph Setup

Spectrum analyzer option 163 required

The ngd_FGS command performs the setup for the frequency deviation graph measurement.

Syntax



Description

The ngd_FGS command followed by the ngd_MEAS command is equivalent to pressing the **FREQ DEV GRAPH** key.

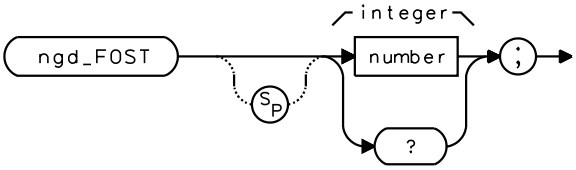
ngd_FOST

Frequency Error Offset

Spectrum analyzer option 163 required

The ngd_FOST command allows you to enter a known frequency error. This error is then subtracted from all the measured values, giving more accurate measurement results.

Syntax

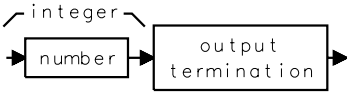


Item	Description	Range
number	A valid integer within the range specified.	–10,000 through 10,000 Hz

Description

The ngd_FOST command is equivalent to pressing the **FREQ ERR OFFSET** key.

Query Response



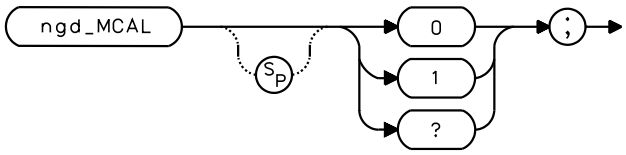
ngd_MCAL

Measurement Calibration

Spectrum analyzer option 163 required

The ngd_MCAL command allows you to initiate a frequency error self-calibration routine which is carried out prior to each frequency error measurement. This should generally be carried out whenever making frequency error measurements. The self-calibration routine can be switched off. This has the benefit of an improved update rate, but the results may not be as accurate.

Syntax

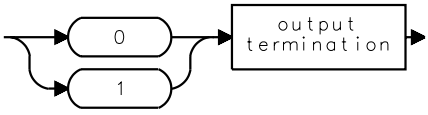


Item	Description
0	Switches the frequency error self-calibration routine off.
1	Switches the frequency error self-calibration routine on.

Description

The ngd_MCAL command is equivalent to pressing the **MEAS CAL ON OFF** key.

Query Response



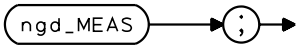
ngd_MEAS

Demodulation Measurement

Spectrum analyzer option 163 required

The ngd_MEAS command makes the demodulation measurement. The Trace A (TRA) and Trace B (TRB) results are determined by the last set-up performed.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed.	
Measurement State = 2	Measurement completed; carrier detected is smaller than –20 dBm.	
Measurement State = 3	Result not valid; bad signal.	
ngd_FRE	Contains the frequency error to a resolution of 1 Hz.	Hz
ngd_PPE	Contains the peak phase error to a resolution of 0.1 °.	°
ngd_RPE	Contains the RMS phase error to a resolution of 0.1 °.	°
TRA	Contains the results waveform for the graph measurements determined by the last setup.	Display Units
TRB	Contains the bit sequence from the data bits measurement if ngd_DBS is set-up.	
ngd_STAT[6]	Number of error bits in burst.	
ngd_STAT[1]	Results status; 0 = Good, >0 = Bad.	

Description

The ngd_MEAS command preceded with the following command:

- ngd_DBS is equivalent to pressing the **DATA BITS** key.
- ngd_FGS is equivalent to pressing the **FREQ DEV GRAPH** key.
- ngd_PFG is equivalent to pressing the **PHASE & FRQ GRAPH** key.
- ngd_PGS is equivalent to pressing the **PHASE GRAPH** key.
- ngd_PFS is equivalent to pressing the **PHASE FREQ** key.

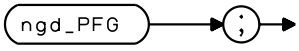
ngd_PFG

Phase and Frequency Graph Setup

Spectrum analyzer option 163 required

The ngd_PFG command performs the setup for the phase and frequency graph measurement.

Syntax



Description

The ngd_PFG command followed by the ngd_MEAS command is equivalent to pressing the **PHASE & FRQ GRAPH** key.

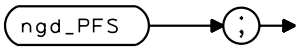
ngd_PFS

Phase Frequency Setup

Spectrum analyzer option 163 required

The ngd_PFS command performs the setup for the phase frequency measurement.

Syntax



Description

The ngd_PFS command followed by the ngd_MEAS command is equivalent to pressing the **PHASE FREQ** key.

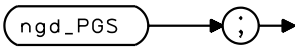
ngd_PGS

Phase Graph Setup

Spectrum analyzer option 163 required

The ngd_PGS command performs the setup for the phase graph measurement.

Syntax



Description

The ngd_PGS command followed by the ngd_MEAS command is equivalent to pressing the **PHASE GRAPH** key.

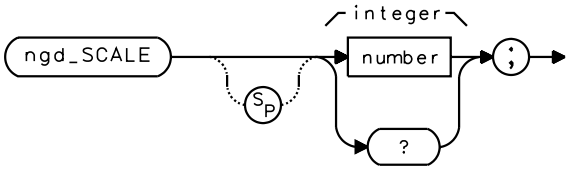
ngd_SCALE

Full Scale Deflection for Phase Graphs

Spectrum analyzer option 163 required

The ngd_SCALE command allows you to configure the scale of the graph to allow you to examine a section of the burst.

Syntax

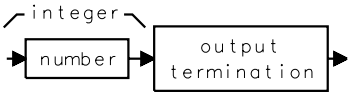


Item	Description	Range
number	A valid integer within the range specified.	1 through 4000

Description

The ngd_SCALE command is equivalent to pressing the **SCALE** key.

Query Response



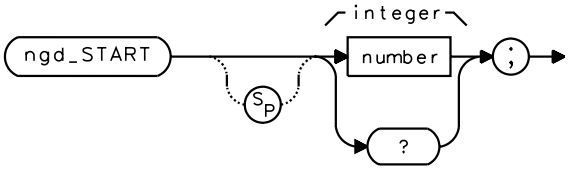
ngd_START

Start Bit Number for Graph Display

Spectrum analyzer option 163 required

The ngd_START command allows you to enter the value of the first bit number in the burst you require on the graph display. This command is used in conjunction with ngd_END.

Syntax

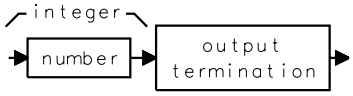


Item	Description	Range
number	A valid integer within the range specified.	0 through 147

Description

The ngd_START command is equivalent to pressing the **START BIT** key.

Query Response



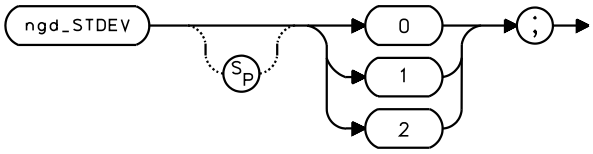
ngd_STDEV

Standard Deviation

Spectrum analyzer option 163 required

The ngd_STDEV command selects standard deviation measurement for the Phase and Frequency Error measurements. When on, this mode overrides the Peak Average (ng_PKAVG) setting.

Syntax

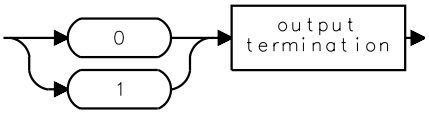


Item	Description
0	Mode off.
1	Mode on.

Description

The ngd_STDEV command is equivalent to pressing the **STD DEV ON OFF** key.

Query Response



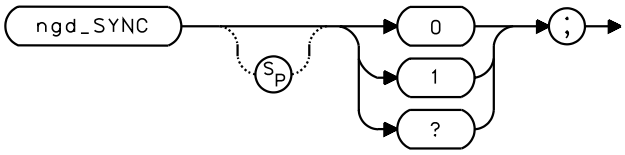
ngd_SYNC

Synchronization Selection

Spectrum analyzer option 163 required

The ngd_SYNC command selects which part of the burst the spectrum analyzer uses for synchronization.

Syntax

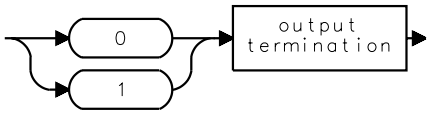


Item	Description
0	Midamble section of the burst is used.
1	Rising edge of the burst is used.

Description

The ngd_SYNC command is equivalent to pressing the **SYNC MID AMPL** key.

Query Response



ngi_INTRARX

Intra-BSS Intermod Attenuation in RX Band Measurement

The ngi_INTRARX command makes the RX band, intra-BSS intermodulation attenuation measurement.

Syntax

Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement aborted; carrier detected in transmit band is larger than –20 dBm.	
ngi_IRESRX	Contains the measurement result.	dBm
ngi_OK = 0	The measurement caution flag: the product measured greater than the GSM specification, and the calculated system DANL is greater than the GSM specification.	
ngi_OK = 1	The measurement caution flag: the product measured less than the GSM specification.	

Description

The ngi_INTRARX command is equivalent to pressing **RX BAND** in the Intra-BSS menu. The default specification for this measurement is contained in the variable ng_ISPECRX.

ngi_INTRATX

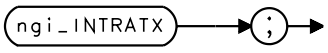
Intra-BSS TX Band Measurement

The ng_INTRATX command makes the TX band, intra-BSS intermodulation attenuation measurement.

The measurement requires a signal that is larger than the quantity:

(–30 dB + EXT ATTEN)

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement aborted; carrier detected is smaller than (–30 dBm + EXT ATTEN).	
Measurement State = 3	Measurement aborted; reference channel error is more than 200 kHz or more than 20 dB lower than total incident power.	
ngi_IRESTXB	Contains the measurement result. The value is in absolute dBm.	dBm
ngi_IRESTXA	Contains the measurement result. The value is in dB relative to the reference channel.	dB
ngi_OK = 0	The measurement caution flag: the product measured greater than the GSM specification, and the calculated system DANL is greater than the GSM specification.	
ngi_OK = 1	The measurement caution flag: the product measured less than the GSM specification.	

Description

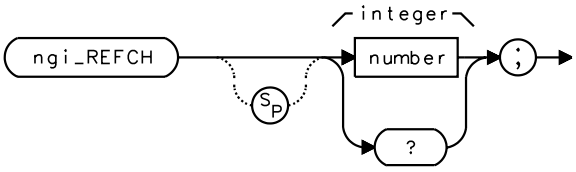
The ngi_INTRATX command is equivalent to pressing **TX BAND** in the Intra-BSS menu. The default specifications for this measurement are contained in the variables ng_ISPCTXA (70 dB from the reference channel) and ng_ISPCTXB (–36 dBm). The test automatically uses the smallest of these two values as the specification.

ngi_REFCH

Reference Channel

The ngi_REFCH command allows you to enter the reference channel (ARFCN) to use during the Intra-BSS TX band measurement.

Syntax

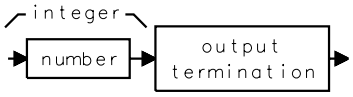


Item	Description	Range
number	An integer within the specified range.	1 through 124, 512 through 885 and 955 through 1023

Description

The ngi_REFCH command is equivalent to pressing the **REF CHANNEL** key.

Query Response

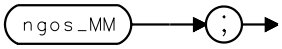


ngos_MM

Modulation Measurement Mode

The ngos_MM command starts the Output RF Spectrum due to Modulation measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement completed; carrier detected is smaller than –20 dBm.	
For ngos_MODE0 Swept Measurement		
TRA	Contains the swept RF spectrum.	dBm
ng_LIMF = 0	Limit pass/fail flag: limit test pass.	
ng_LIMF = 1	Limit pass/fail flag: limit test fail.	
ng_LIMF = 2	Limit pass/fail flag: limit test off.	
For ngos_MODE1 Multiple Offset Measurement		
	Results stored in groups of 5, where n = 0 to n^{th}frequency offset (n = 16, maximum).	
ngos_RES[5n+1]	Contains the magnitude of the offset frequency.	kHz
ngos_RES[5n+2]	Contains the relative amplitude for negative offset frequency.	$\frac{1}{10}$ dB*
ngos_RES[5n+3]	Contains the absolute amplitude for negative offset frequency.	$\frac{1}{10}$ dB*
ngos_RES[5n+4]	Contains the relative amplitude for positive offset frequency.	$\frac{1}{10}$ dB*

Variable or Trace	Description of Contents	Units
ngos_RES[5n+5]	Contains the absolute amplitude for positive offset frequency.	$\frac{1}{10}$ dB*
For ngos_MODE2 Single Offset Measurement		
ng_COFST	Contains the offset frequency.	Hz
ngos_DBC	Contains the relative average amplitude value.	dB
ngos_DBM	Contains the absolute average amplitude value.	dBm
TRA	Contains the results waveform.	dBm
***** Divide the value by 10 to convert to dB.		

Description

For ngos_MODE0, the ngos_MS command followed by the ngos_MM command is equivalent to pressing **MODULAT SWEPT**.
For ngos_MODE1, the ngos_MS command followed by the ngos_MM command is equivalent to pressing **MODULAT MULTIPLE**.
For ngos_MODE2, the ngos_MS command followed by the ngos_MM command is equivalent to pressing **MODULAT SINGLE**.

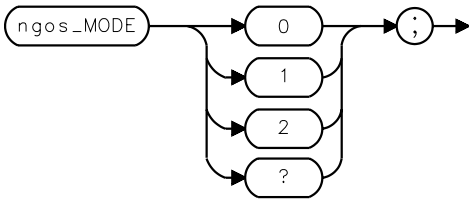
Use the ng_COFST command followed by ng_RPT command to make a measurement at the selected carrier offset frequency.

ngos_MODE

Output RF Spectrum Measurement Mode

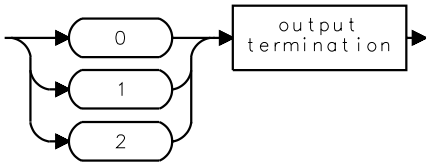
The ngos_MODE command allows you to select the measurement mode for the Output RF Spectrum measurements. The ngos_MODE command must precede the ngos_MS command or ngos_TS command.

Syntax



Item	Description
0	The swept spectrum measurement.
1	The multiple discrete frequency measurement mode.
2	The single frequency measurement mode.

Query Response

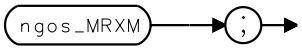


ngos_MRXM

Modulation RX Band Measurement

The ngos_MRXM command starts the Output RF Spectrum due to Modulation in the RX Band measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
TRA	Contains the measurement result for RX band spectrum measurement.	dBm
ng_LIMF = 0	Limit pass/fail flag: limit test pass.	
ng_LIMF = 1	Limit pass/fail flag: limit test fail.	
ng_LIMF = 4	Limit pass/fail flag: limit test off.	

Description

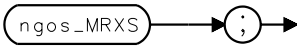
The ngos_MRXS command followed by the ngos_MRXM command is equivalent to pressing the **MODULAT RX BAND** key.

ngos_MRXS

Modulation RX Band Setup

The ngos_MRXS command sets up the parameters of the spectrum analyzer to make the Output RF Spectrum due to Modulation in the RX band measurement.

Syntax



Description

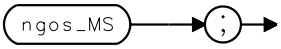
The ngos_MRXS command followed by the ngos_MRXM command is equivalent to pressing the **MODULAT RX BAND** key.

ngos_MS

Modulation Setup

The ngos_MS command sets the spectrum analyzer to make the Output RF Spectrum due to Modulation measurement.

Syntax



Description

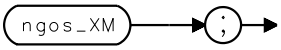
For ngos_MODE0, the ngos_MS command followed by the ngos_MM command is equivalent to pressing **MODULAT SWEPT**.
For ngos_MODE1, the ngos_MS command followed by the ngos_MM command is equivalent to pressing **MODULAT MULTIPLE**.
For ngos_MODE2, the ngos_MS command followed by the ngos_MM command is equivalent to pressing **MODULAT SINGLE**.

ngos_XM

Transient Measurement

The ngos_XM command starts the Output RF Spectrum due to Transient Switching measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1 Measurement State = 2	Measurement completed; no errors detected. Measurement completed; carrier detected is smaller than –20 dBm.	
For ngos_MODE0 Swept Measurement		
TRA ng_LIMF = 0 ng_LIMF = 1 ng_LIMF = 2	Contains the swept RF spectrum. Limit pass/fail flag: limit test pass. Limit pass/fail flag: limit test fail. Limit pass/fail flag: limit test off.	dBm

For ngos_MODE1 Multiple Offset Measurement	

Variable or Trace	Description of Contents	Units
Results are stored in groups of 5,where n = 0 to n^{th} frequency offset (n = 16,maximum).		
ngos_RES[5n+1]	Contains the magnitude of the offset frequency.	kHz
ngos_RES[5n+2]	Contains the relative amplitude for negative offset frequency.	$\frac{1}{10}$ dB*
ngos_RES[5n+3]	Contains the absolute amplitude for negative offset frequency.	$\frac{1}{10}$ dB*
ngos_RES[5n+4]	Contains the relative amplitude for positive offset frequency.	$\frac{1}{10}$ dB*
ngos_RES[5n+5]	Contains the absolute amplitude for positive offset frequency.	$\frac{1}{10}$ dB*
For ngos_MODE2 Single Offset Measurement		
ng_COFST	Contains the offset frequency.	Hz
ngos_DBC	Contains the relative peak amplitude value.	dB
ngos_DBM	Contains the absolute peak amplitude value.	dBm
TRA	Contains the results waveform.	dBm
***** Divide the value by 10 to convert to dB.		

Description

For ngos_MODE0, the ngos_XS command followed by the ngos_XM command is equivalent to pressing **`TRANSNT SWEPT`**.
For ngos_MODE1, the ngos_XS command followed by the ngos_XM command is equivalent to pressing **`TRANSNT MULTIPLE`**.
For ngos_MODE2, the ngos_XS command followed by the ngos_XM command is equivalent to pressing **`TRANSNT SINGLE`**.

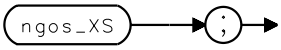
Use the ng_COFST command followed by ng_RPT command to make a measurement at the selected carrier offset frequency.

ngos_XS

Transient Measurement Setup

The ngos_XS command sets up the spectrum analyzer parameters for making the Output RF Spectrum due to Transient Switching measurement.

Syntax



Description

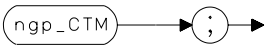
For ngos_MODE0, the ngos_XS command followed by the ngos_XM command is equivalent to pressing **`TRANSNT SWEPT`**.
For ngos_MODE1, the ngos_XS command followed by the ngos_XM command is equivalent to pressing **`TRANSNT MULTIPLE`**.
For ngos_MODE2, the ngos_XS command followed by the ngos_XM command is equivalent to pressing **`TRANSNT SINGLE`**.

ngp_CTM

Combiner Tuning Measurement

The ngp_CTM command starts the combiner tuning measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
TRA	TRA is trace A. Trace A contains the swept RF spectrum.	dBm
TRB	TRB is trace B. Trace B acts as a marker line, and it is placed at the signal peak with the maximum amplitude.	dBm
TRC	TRC is trace C. Trace C acts as a marker line, and it is placed at the signal peak with the minimum amplitude.	dBm

Description

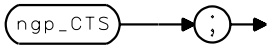
The ngp_CTS command followed by the ngp_CTM command is equivalent to pressing the **COMBINER TUNING**.

ngp_CTS

Combiner Tuning Setup

The ngp_CTS command performs the setup for the combiner tuning measurement.

Syntax



Description

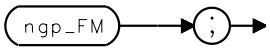
The ngp_CTS command followed by the ngp_CTM command is equivalent to pressing the **COMBINER TUNING** key.

ngp_FM

Power vs. Time Falling Edge Measurement

The ngp_FM command starts the Power vs. Time Falling Edge measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement completed; carrier detected is smaller than –20 dBm.	
ng_LIMF = 0	Limit pass/fail flag: limit test pass.	
ng_LIMF = 1	Limit pass/fail flag: limit test fail.	
ng_LIMF = 4	Limit pass/fail flag: limit test off.	
For number bursts equals 1:		
TRA	Contains the carrier power vs. time waveform.	dBm
For number bursts equals more than 1, average mode:		
TRA	Contains the average power vs. time waveform.	dBm
For number bursts equals more than 1, peaks mode:		
TRB	Contains the maximum power vs. time waveform.	dBm
TRC	Contains the minimum power vs. time waveform.	dBm

Description

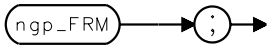
The ngp_FS command followed by the ngp_FM command is equivalent to pressing the **`P vs T FALLING`** key.

ngp_FRM

Power vs. Time Frame Measurement

The ngp_FRM command starts the Power vs. Time Full Frame measurement. The spectrum analyzer's reference level is automatically set to an appropriate value based upon the measured peak power.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement completed; carrier detected is smaller than –20 dBm.	
ng_LIMF = 0	Limit pass/fail flag: limit test pass.	
ng_LIMF = 1	Limit pass/fail flag: limit test fail.	
ng_LIMF = 4	Limit pass/fail flag: limit test off.	
For number bursts equals 1:		
TRA	Contains the carrier power vs. time waveform.	dBm
For number bursts equals more than 1, average mode:		
TRA	Contains the average power vs. time waveform.	dBm
For number bursts equals more than 1, peaks mode:		
TRB	Contains the maximum power vs. time waveform.	dBm
TRC	Contains the minimum power vs. time waveform.	dBm

Description

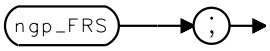
The ngp_FRS command followed by the ngp_FRM command is equivalent to pressing the **P vs T FRAME** key.

ngp_FRS

Power vs. Time Frame Measurement Setup

The ngp_FRS command sets the spectrum analyzer parameters for making the Power vs. Time Full Frame measurement.

Syntax



Description

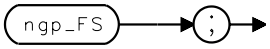
The ngp_FRS command followed by the ngp_FRM command is equivalent to pressing the **P vs T FRAME** key.

ngp_FS

Power vs. Time Falling Edge Measurement Setup

The ngp_FS command sets the spectrum analyzer parameters to make the Power vs. Time Falling Edge measurement. Precede this command with the ngp_SSS command, followed by the ngp_SSM command.

Syntax



Description

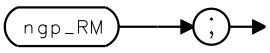
The ngp_FS command followed by the ngp_FM command is equivalent to pressing the **P vs T FALLING** key. If the transmitter power level is increased or decreased more than 0.2 dB since the last time you executed the ngp_SSS followed by ngp_SSM commands, it is necessary to set up the spectrum analyzer to make the Power vs. Time Falling Edge measurement at the new power level. Execute ngp_SSS followed by ngp_SSM commands again, before executing ngp_FS followed by ngp_FM.

ngp_RM

Power vs. Time Rising Edge Measurement

The ngp_RM command starts the Power vs. Time Rising Edge measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement completed; carrier detected is smaller than −20 dBm.	
ng_LIMF = 0	Limit pass/fail flag: limit test pass.	
ng_LIMF = 1	Limit pass/fail flag: limit test fail.	
ng_LIMF = 4	Limit pass/fail flag: limit test off.	
For number bursts equals 1:		
TRA	Contains the carrier power vs. time waveform.	dBm
For number bursts equals more than 1, average mode:		
TRA	Contains the average power vs. time waveform.	dBm
For number bursts equals more than 1, peaks mode:		
TRB	Contains the maximum power vs. time waveform.	dBm
TRC	Contains the minimum power vs. time waveform.	dBm

Description

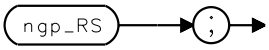
The ngp_RS command followed by the ngp_RM command is equivalent to pressing the **`P vs T RISING`** key.

ngp_RS

Power vs. Time Rising Edge Measurement Setup

The ng_RS command sets the spectrum analyzer parameters to make the Power vs. Time Rising Edge measurement. Precede this command with the ngp_SSS command, followed by ngp_SSM.

Syntax



Description

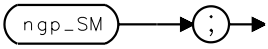
The ngp_RS command followed by the ngp_RM command is equivalent to pressing the **P vs T RISING** key. If the transmitter power level is increased or decreased more than 0.2 dB since the last time you executed the ngp_SSS followed by ngp_SSM commands, it is necessary to set up the spectrum analyzer to make the Power vs. Time Rising Edge measurement at the new power level. Execute ngp_SSS followed by ngp_SSM commands again, before executing ngp_RS followed by ngp_RM.

ngp_SM

Power vs. Time Timeslot Measurement

The ngp_SM command starts the Power vs. Time Full Timeslot measurement.

Syntax



Description

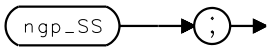
The ngp_SS command followed by the ngp_SM command is equivalent to pressing the **P vs T TIMESLOT** key.

ngp_SS

Power vs. Time Timeslot Measurement Setup

The ngp_SS command sets up the spectrum analyzer to make the Power vs. Time Timeslot measurement.

Syntax



Description

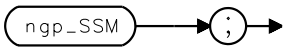
The ngp_SS command followed by the ngp_SM command is equivalent to pressing the **P vs T TIMESLOT** key.

ngp_SSM

Power vs. Time Frame Sub-Timeslot Measurement

The ngp_SSM command starts the Power vs. Time Sub-Timeslot measurement. This command operation must be executed prior to measuring the power vs. time rising edge, falling edge, or Top 10 dB measurements.

Syntax



Description

The ngp_SSS command followed by the ngp_SSM command is equivalent to pressing the **P vs T SUB TS** key. Measurement results do not immediately follow this command execution. This command is only a preliminary measurement. This command does not need to *directly* precede the Power vs. Time Rising Edge, Falling Edge or Top 10 dB measurement commands, but can be executed just once, prior to these other measurements.

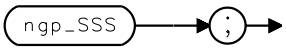
If the transmitter power level is increased or decreased more than 0.2 dB since the last time you executed the ngp_SSS command followed by the ngp_SSM command, execute ngp_SSS followed by ngp_SSM again before executing any of the Power vs. Time Rising Edge, Falling Edge or Top 10 dB commands.

ngp_SSS

Power vs. Time Sub-Timeslot Measurement Setup

The ngp_SSS sets up the spectrum analyzer parameters to make the Power vs. Time Sub-Timeslot measurements.

Syntax



Description

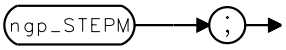
The ngp_SSS command followed by the ngp_SSM command is equivalent to pressing the **P vs T SUB TS** key.

ngp_STEPM

Power vs. Time Power Steps Measurement

The ngp_STEPM command starts the Power Steps measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
TRA	Contains the power waveform.	dBm

Description

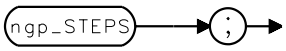
The ngp_STEPS command followed by the ngp_STEPM command is equivalent to pressing the **POWER STEPS** key.

ngp_STEPS

Power vs. Time Power Steps Measurement Setup

The ngp_STEPS command sets the spectrum analyzer parameters for making the Power Steps measurement.

Syntax



Description

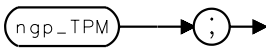
The ngp_STEPS command followed by the ngp_STEPM command is equivalent to pressing the **POWER STEPS** key.

ngp_TPM

Power vs. Time Top 10 dB Measurement

The ngp_TPM command starts the Power vs. Time Top 10 dB measurement.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 2	Measurement completed; carrier detected is smaller than –20 dBm.	
ng_LIMF = 0	Limit pass/fail flag: limit test pass.	
ng_LIMF = 1	Limit pass/fail flag: limit test fail.	
ng_LIMF = 4	Limit pass/fail flag: limit test off.	
For number bursts equals 1:		
TRA	Contains the carrier power vs. time waveform.	dBm
For number bursts equals more than 1, average mode:		
TRA	Contains the average power vs. time waveform.	dBm
For number bursts equals more than 1, peaks mode:		
TRB	Contains the maximum power vs. time waveform.	dBm
TRC	Contains the minimum power vs. time waveform.	dBm

Description

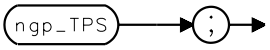
The ngp_TPS command followed by the ngp_TPM command is equivalent to pressing the `P vs T TOP 10dB` key.

ngp_TPS

Power vs. Time Top 10 dB Measurement Setup

The ng_TPS command sets up the spectrum analyzer to make the Power vs. Time Top 10 dB measurement. You must precede this command with ngp_SSS, followed by ngp_SSM. Refer to the description below.

Syntax



Description

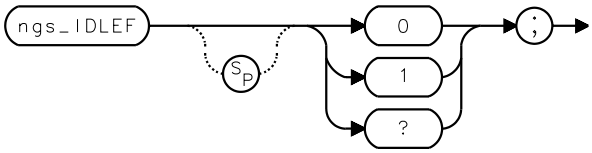
The ngp_TPS command followed by the ngp_TPM command is equivalent to pressing the **`P vs T TOP 10dB`** key. If the transmitter power level increased or decreased more than 0.2 dB since the last time you executed the ngp_SSS followed by ngp_SSM commands, it is necessary to set up the spectrum analyzer to make the Power vs. Time Top 10 dB measurement at the new power level. Execute ngp_SSS followed by ngp_SSM commands again, before executing ngp_TPS followed by ngp_TPM.

ngs_IDLEF

Spurious Emissions Measurement Carrier Idle Flag

The ngs_IDLEF command sets a flag which controls the action of the ngs_MEASTX and ngs_MEASOUT commands when making spurious emissions measurements on mobile station transmitters.

Syntax

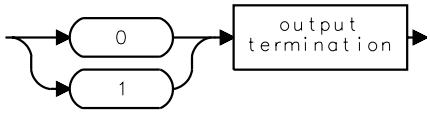


Item	Description
0	Non-idle mode.
1	The idle mode.

Description

The ngs_IDLEF command is equivalent to pressing **IDLE YES NO** in the Transmitter Spurious menu.

Query Response

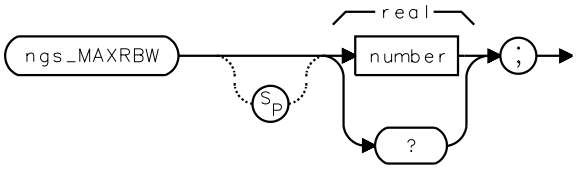


ngs_MAXRBW

Spurious Emissions Measurement Maximum Resolution Bandwidth

The ngs_MAXRBW command sets the maximum resolution bandwidth during the spurious emissions measurements. The value entered is rounded to a value closest to 300 kHz, 1 MHz, or 3 MHz.

Syntax

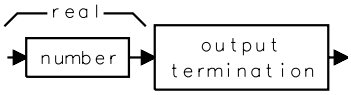


Item	Description	Range
number	Any real number within the range specified.	300E3 Hz to 3E6 Hz

Description

The ngs_MAXRBW command is equivalent to pressing the **MAXIMUM RES BW** key.

Query Response

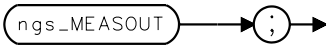


ngs_MEASOUT

Spurious Emissions Outside Band Measurement

The ngs_MEASOUT command makes the spurious emissions measurements on the outside bands.

Syntax



Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 3	Measurement aborted; carrier detected is larger than –16 dBm for Mobile Station Idle Mode measurement or for Receiver measurement.	
ngs_NOCARRF = 0	The carrier detected is larger than–16 dBm.	
ng_NOCARRF = 1	No carrier detected is larger than –16dBm.	
ngs_SPCNT	Contains the number of spurs found.	
ngs_SPAMP[n]	Contains the array of amplitude values (multiplied by 10) for spurs found.	$\frac{1}{10}$ dB
ngs_SPFRQM[n]	Contains the array of frequency values (MHz portion) of the spurs found.	MHz
ngs_SPFRQK[n]	Contains the frequency values (kHz portion) of the spurs found.	kHz
ngs_SPOK[n]	Contains the array of measurement caution flags forthe spurs found.	
= 0	The spur measured with calculated spectrum analyzer DANL larger than the quantity: (GSM specification – 6 dB).	
= 1	The spur measured with calculated spectrum analyzer DANL smaller than the quantity: (GSM specification – 6 dB).	
Index the arrays by stepping n from1to ngs_SPCNT. Divide the value in ngs_SPAMP[n] by 10 to convert the spur amplitude values to dBm. Divide the value in ngs_SPFRQK[n] by1000, then add this to the (MHz) value in ngs_SPFRQM[n] to obtain the spur's full frequency value. Spur Frequency = ngs_SPFRQM[n]+ (ngs_SPFRQK[n]/1000)		

Description

The ngs_RCVRF0 command followed by the ngs_MEASOUT command is equivalent to pressing **OUTSIDE TX RX** in the Transmitter Spurious menu.

The ngs_RCVRF1 command followed by ngs_MEASOUT command is equivalent to pressing **OUTSIDE TX BAND** in the Receiver Spurious menu.

ngs_MEASRX

Spurious Emissions RX Band Measurement

The ngs_MEASRX command makes the spurious emissions measurements in the receive band.

Syntax

Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 3	Measurement aborted; carrier detected is larger than –20 dBm.	
ngs_SPCNT	Contains the number of spurs found.	
ngs_SPAMP[n]	Contains the array of amplitude values (multiplied by 10) for spurs found.	$\frac{1}{10}$ dB
ngs_SPFRQM[n]	Contains the array of frequency values (MHz portion) of the spurs found.	MHz
ngs_SPFRQK[n]	Contains the frequency values (kHz portion) of the spurs found.	kHz
ngs_SPOK[n]	Contains the array of measurement caution flags for the spurs found.	
= 0	The spur measured with calculated spectrum analyzer DANL larger than the quantity: (GSM specification – 6 dB).	
= 1	The spur measured with calculated spectrum analyzer DANL smaller than the quantity: GSM specification – 6 dB).	
Index the arrays by stepping n from1to ngs_SPCNT. Divide the value in ngs_SPAMP[n] by 10 to convert the spur amplitude values to dBm. Divide the value in ngs_SPFRQK[n] by1000, then add this to the (MHz) value in ngs_SPFRQM[n] to obtain the spur's full frequency value. Spur Frequency = ngs_SPFRQM[n]+ (ngs_SPFRQK[n]/1000)		

Description

The ngs_RCVRF0 command followed by ngs_MEASRX command is equivalent to pressing **RX BAND** in the Transmitter Spurious menu.

ngs_MEASTX

Spurious Emissions TX Band Measurement

The ngs_MEASTX command sets up the spectrum analyzer to make spurious emissions measurements in the transmit bands, then starts the measurement.

Syntax

Variable or Trace	Description of Contents	Units
Measurement State = 1	Measurement completed; no errors detected.	
Measurement State = 3	Measurement aborted; carrier detected is larger than –16 dBm for mobile station Idle Mode measurement or for the Receiver measurement.	
ngs_NOCARRF = 0	The carrier detected is larger than –16 dBm.	
ng_NOCARRF = 1	No carrier detected is larger than –16dBm. (The test continues, using the current ARFCN value.)	
ngs_SPCNT	Contains the number of spurs found.	
ngs_SPAMP[n]	Contains the array of amplitude values (multiplied by 10) for spurs found.	$\frac{1}{10}$dB
ngs_SPFRQM[n]	Contains the array of frequency values (MHz portion) of the spurs found.	MHz
ngs_SPFRQK[n]	Contains the frequency values (kHz portion) of the spurs found.	kHz
ngs_SPOK[n]	Contains the array of measurement caution flags forthe spurs found.	
= 0	The spur measured with calculated spectrum analyzer DANL larger than the quantity: (GSM specification – 6 dB).	
= 1	The spur measured with calculated spectrum analyzer DANL smaller than the quantity: (GSM specification – 6 dB).	
Index the arrays by stepping n from1to ngs_SPCNT. Divide the value in ngs_SPAMP[n] by 10 to convert the spur amplitude values to dBm. Divide the value in ngs_SPFRQK[n] by1000, then add this to the (MHz) value in ngs_SPFRQM[n] to obtain the spur's full frequency value. Spur Frequency = ngs_SPFRQM[n]+ (ngs_SPFRQK[n]/1000)		

Description

The ngs_RCVRF0 command followed by ngs_MEASTX command is equivalent to pressing **TX BAND** in the Transmitter Spurious menu.

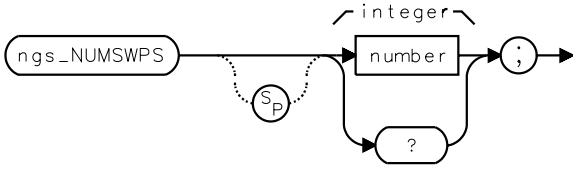
The ngs_RCVRF1 command followed by ngs_MEASX command is equivalent to pressing **TX BAND** in the Receiver Spurious menu.

ngs_NUMSWPS

Number of Sweeps

The ngs_NUMSWPS command sets the number of sweeps taken (for each frequency span) during spurious emissions measurement.

Syntax

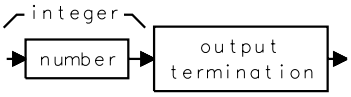


Item	Description	Range
number	An integer within the range specified.	1 through 99

Description

The ngs_NUMSWPS command is equivalent to pressing **NUMBER SWEEPS**.

Query Response

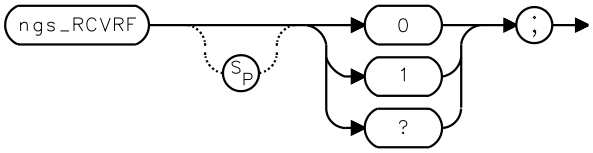


ngs_RCVRF

Receiver Flag

The ngs_RCVRF command is a flag which controls the action of the ngs_MEASTX and ngs_MEASOUT commands.

Syntax



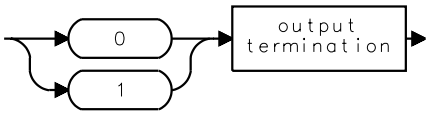
Variable	Description
ngs_RCVR = 0	The commands ngs_MEASTX and ngs_MEASOUT make transmitter spurious measurements.
ngs_RCVR = 1	The commands ngs_MEASTX and ngs_MEASOUT make receiver spurious measurements.

Description

The ngs_RCVRF0 command is equivalent to pressing **XMTR SPURIOUS**.

The ngs_RCVRF1 command is equivalent to pressing **RCVR SPURIOUS**.

Query Response

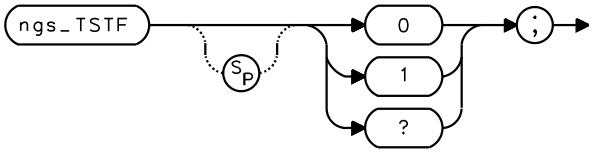


ngs_TSTF

Spur Test Flag

The ngs_TSTF command sets a flag which enables a spur test on the spurious emissions measurements. It can be used in the majority of applications to detect spurs which are internally generated by the spectrum analyzer without affecting the measurement of the external spurs. If the spur is determined to be internally generated it is removed from the table of spurious signals.

Syntax

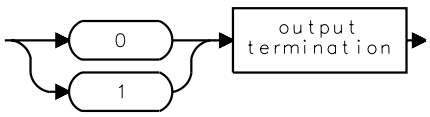


Variable	Description
ngs_TSTF = 0	Switches the spur check off.
ngs_TSTF = 1	Switches the spur check on.

Description

The ngs_TSTF command is equivalent to pressing **SPUR TST ON OFF**.

Query Response



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