Agilent Technologies 8935 Series E6381A TDMA Base Station Test Set

GPIB Syntax Reference Guide

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Notice

Information contained in this document is subject to change without notice.

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1 General Information

This chapter contains generic information about the product, safety, warranty, sales and service offices, power cables, and other information.

Manufacturer's Declaration

This statement is provided to comply with the requirements of the German Sound Emission Directive, from 18 January 1991.

This product has the following sound pressure emission specification:

- sound pressure Lp <70 dB(A)
- at the operator position
- under normal operation
- according to ISO 7779:1988/EN 27779:1991 (Type Test).

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlärminformationsverordnung vom 18 Januar 1991.

- Schalldruckpegel Lp < 70 dB(A).
- Am Arbeitsplatz.
- Normaler Betrieb.
- Nach ISO 7779:1988/EN 27779:1991 (Typprüfung).

Safety Considerations

GENERAL

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation.

This product has been designed and tested in accordance with IEC Publication 61010-1+A1+A2:1992 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use and has been supplied in a safe condition. This instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

SAFETY EARTH GROUND

A uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set.

CHASSIS GROUND TERMINAL

To prevent a potential shock hazard, always connect the rear-panel chassis ground terminal to earth ground when operating this instrument from a dc power source.

SAFETY SYMBOLS


Indicates instrument damage can occur if indicated operating limits are exceeded. Refer to the instructions in this guide.


Indicates hazardous voltages.


Indicates earth (ground) terminal

WARNING **A WARNING note denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.**

CAUTION A CAUTION note denotes a hazard. It calls attention to an operation procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond an CAUTION note until the indicated conditions are fully understood and met.

Safety Considerations for This Instrument

WARNING

Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an autotransformer (for voltage reduction), make sure the common terminal is connected to the earth terminal of the power source.

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

No operator serviceable parts in this product. Refer servicing to qualified personnel.To prevent electrical shock, do not remove covers.

Servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the product from all voltage sources while it is being opened.

Adjustments described in the manual are performed with power supplied to the instrument while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

For Continued protection against fire hazard, replace the line fuse(s) with T 250 V 5.0 A fuse(s) or the same current rating and type. Do not use repaired fuses or short circuited fuseholders.

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

WARNING **Always use the three-prong ac power cord supplied with this product. Failure to ensure adequate earth grounding by not using this cord may cause personal injury and/or product damage.**

This product is designed for use in Installation Category II and Pollution Degree 3 per IEC 61010 and IEC 60664 respectively.

This product has autoranging line voltage input, be sure the supply voltage is within the specified range.

To prevent electrical shock, disconnect instrument from mains (line) before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.

Ventilation Requirements: When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4° C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

WARNING **RUBIDIUM REFERENCE ASSEMBLY**

The optional Rubidium Reference assembly of the Test Set contains the radioactive isotope Rubidium 87. This assembly contains no user serviceable parts. DO NOT attempt to repair it. There is no measurable external radiation. This assembly does not present a safety hazard. This assembly is regulated as a hazardous waste and must be disposed of in accordance with local, state, and federal regulations. For important shipping information, see

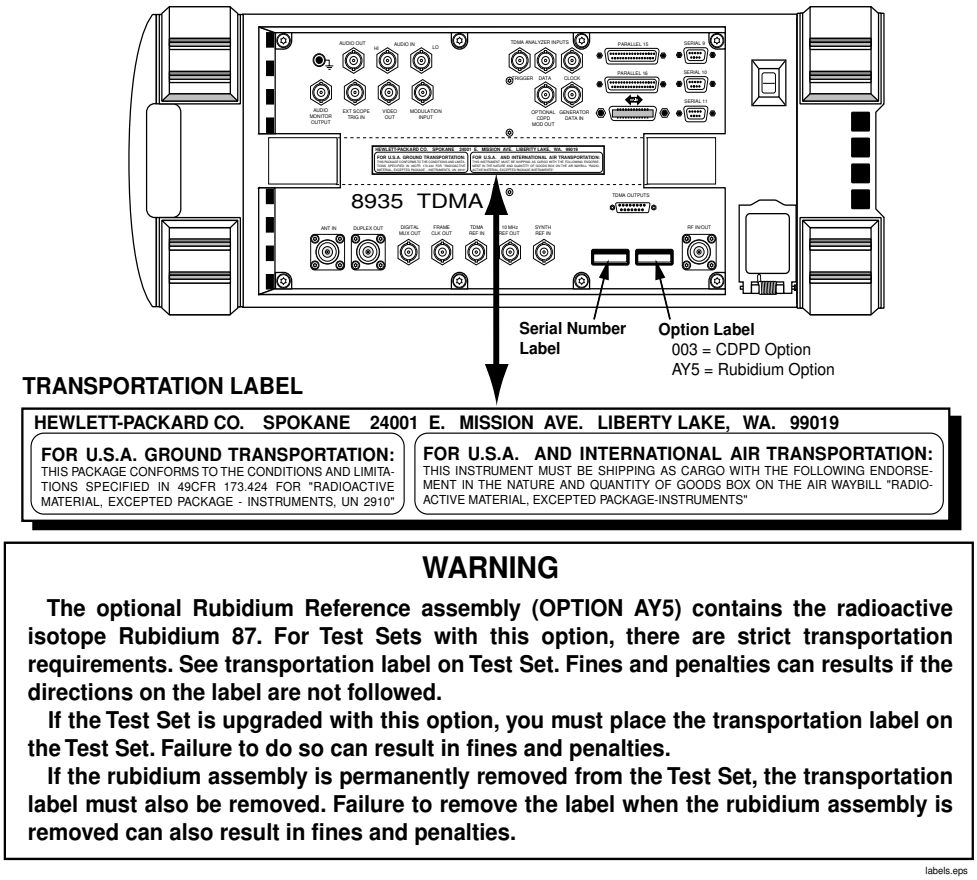
FOR GROUND TRANSPORTATION IN THE U.S.A:

This package conforms to the conditions and limitations specified in 49CFR 173.424 for radioactive material, excepted package – instruments, UN2910.

FOR AIR TRANSPORTATION IN THE U.S.A. AND INTERNATIONAL:

This instrument must be shipped as cargo with the following endorsement in the nature and quantity of goods box on the air waybill, “Radioactive material, excepted package – instruments.”

Figure 1 Rubidium Transportation Labels



WARNING

The optional Rubidium Reference assembly (OPTION AY5) contains the radioactive isotope Rubidium 87. For Test Sets with this option, there are strict transportation requirements. See transportation label on Test Set. Fines and penalties can results if the directions on the label are not followed.

If the Test Set is upgraded with this option, you must place the transportation label on the Test Set. Failure to do so can result in fines and penalties.

If the rubidium assembly is permanently removed from the Test Set, the transportation label must also be removed. Failure to remove the label when the rubidium assembly is removed can also result in fines and penalties.

labels.eps

Lifting and Handling

When lifting and handling the Agilent 8935 TDMA Cellular/PCS Base Station Test Set use ergonomically correct procedures. Lift and carry by the strap on the side panel.

When moving the Test Set more than a few feet, be sure to replace the front screen cover.

Consumables

Two AA alkalyne batteries are supplied with the Test Set and must be replaced periodically. When replacing batteries always dispose of old batteries in a conscientious manner, following manufacturer's instructions.

Product Markings

The CE mark shows that the product complies with all relevant European legal Directives (if accompanied by a year, it signifies when the design was proven).

The CSA mark is a registered trademark of the Canadian Standards Association.

Certification

Agilent Technologies certifies that this product met its published specifications at the time of shipment from the factory. Agilent further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and CEN/CENELEC EN45014

Manufacturer's Name:	**Agilent Technologies UK Limited**
Manufacturer's Address:	Electronic Products Solutions Group - Queensferry South Queensferry West Lothian, EH30 9TG Scotland, United Kingdom

Declares that the product

Product Name:	TDMA PCS Base Station Test Set
Model Number:	E6381A
Product Options:	This declaration covers all options of the above product as detailed in TCF A-5951-9852-02.

EMC:

Conforms with the protection requirements of European Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic compatibility, against EMC test specifications EN 55011:1991 (Group 1, Class A) and EN 50082-1:1992.

As Detailed in:	Electromagnetic Compatibility (EMC) Technical Construction File (TCF) No. A-5951-9852-02.
Assessed by:	DTI Appointed Competent Body EMC Test Centre, GEC-Marconi Avionics Ltd., Maxwell Building, Donibristle Industrial Park, Hillend, Dunfermline KY11 9LB Scotland, United Kingdom

Technical Report Number:6893/2201/CBR, dated 23 September 1997

Safety:

The product conforms to the following safety standards:

IEC 61010-1(1990) +A1(1992) +A2(1995) / EN 61010-1:1993
IEC 60825-1(1993) / EN 60825-1:1994
Canada / CSA-C22.2 No. 1010.1-93

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC, and carries the CE mark accordingly

South Queensferry, Scotland. ***1st November 2000*** R M Evans

R.M. Evans / Manufacturing Engineering Manager

For further information, please contact your local Agilent Technologies sales office, agent, or distributor.

Agilent Technologies Warranty Statement for Commercial Products

E6381A TDMA/Cellular PCS Base Station Test Set

Duration of Warranty: 1 Year

1. Agilent warrants Agilent hardware, accessories and supplies against defects in materials and workmanship for the period specified above. If Agilent receives notice of such defects during the warranty period, Agilent will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.
2. Agilent warrants that Agilent software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If Agilent receives notice of such defects during the warranty period, Agilent will replace software media which does not execute its programming instructions due to such defects.
3. Agilent does not warrant that the operation of Agilent products will be uninterrupted or error free. If Agilent is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.
4. Agilent products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.
5. The warranty period begins on the date of delivery or on the date of installation if installed by Agilent. If customer schedules or delays Agilent installation more than 30 days after delivery, warranty begins on the 31st day from delivery.
6. Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by Agilent, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.

7. TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTYOR CONDITION, WHETHER WRITTEN OR ORAL IS EXPRESSED OR IMPLIED AND Agilent SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OR CONDITIONS OR MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.
8. Agilent will be liable for damage to tangible property per incident up to the greater of $300,000 or the actual amount paid for the product that is the subject of the claim, and for damages for bodily injury or death, to the extent that all such damages are determined by a court of competent jurisdiction to have been directly caused by a defective Agilent product.
9. TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL Agilent OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

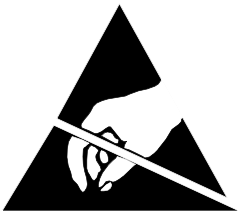
   FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND: THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products. For any assistance, contact your nearest Agilent Technologies Sales and Service Office.

Table 1-2 Regional Sales and Service Office s

United States of America: Agilent Technologies Test and Measurement Call Center P.O. Box 4026 Englewood, CO 80155-4026 (tel) 1 800 452 4844	Canada: Agilent Technologies Canada Inc. 5150 Spectrum Way Mississauga, Ontario L4W 5G1 (tel) 1 877 894 4414	Europe: Agilent Technologies European Marketing Organization P.O. Box 999 1180 AZ Amstelveen The Netherlands (tel) (3120) 547 9999
Japan: Agilent Technologies Japan Ltd. Measurement Assistance Center 9-1 Takakura-Cho, Hachioji-Shi, Tokyo 192-8510, Japan (tel) (81) 456-56-7832 (fax) (81) 426-56-7840	Latin America: Agilent Technologies Latin America Region Headquarters 5200 Blue Lagoon Drive, Suite #950 Miami, Florida 33126 U.S. A. (tel) (305) 267 4245 (fax) (305) 267 4286	Australia/New Zealand: Agilent Technologies Australia Pty Ltd. 347 Burwood Highway Forest Hill, Victoria 3131 (tel) 1 800 629 485 (Australia) (fax) (61 3) 9272 0749 (tel) 0 800 738 378 (New Zealand) (fax) (64 4) 802 6881
Asia Pacific: Agilent Technologies 24/F, Cityplaza One, 111 Kings Road, Taikoo Shing, Hong Kong (tel) (852) 3197 7777 (fax) (852) 2506 9233		



ATTENTION

Static Sensitive
Devices

This instrument was constructed in an ESD (electro-static discharge) protected environment. This is because most of the semiconductor devices used in this instrument are susceptible to damage by static discharge.

Depending on the magnitude of the charge, device substrates can be punctured or destroyed by contact or mere proximity of a static charge. The result can cause degradation of device performance, early failure, or immediate destruction.

These charges are generated in numerous ways such as simple contact, separation of materials, and normal motions of persons working with static sensitive devices.

When handling or servicing equipment containing static sensitive devices, adequate precautions must be taken to prevent device damage or destruction.

Only those who are thoroughly familiar with industry accepted techniques for handling static sensitive devices should attempt to service circuitry with these devices.

Documentation

Conventions Used in This Manual

The following conventions are used throughout this manual to help clarify instructions and reduce unnecessary text:

- **Test Set** refers to the Agilent Technologies 8935 Series E6381A TDMA Base StationTest Set.
- Test Set keys are indicated like this: **Preset**
- Test Set screen information, such as a measurement result or an error message, is shown like this: `TX Power 7.21 W`

Which Document is Required?

The following documents are part of the Test Set's document set. Use the table to help you decide which document you need.

Table 1-3 Document Navigation

Document	Part Number	Usage
AMPS Application Guide	E6381-90017	Use this manual for making AMPS base station measurements.
Programmer's Guide	E6380-90018	Use this manual to learn how to program the Test Set.
GPIB Syntax Guide	E6381-90014	Use this listing of GPIB syntax when writing control programs for the Test Set.
Assembly Level Repair Guide	E6381-90015	Use this manual to perform calibration on the Test Set and for general service information.
Reference Guide	E6381-90019	Use this manual for general information on accessing and changing settings, general Test Set operation, connector descriptions, and error messages. It also contains information on loading and running the various automated test routines (RF Tools) built in to the Test Set.
HELP Screens	(integral to Test Set)	Pressing the **Help** key accesses information on a variety of Test Set operations and tests.
CD-ROM	E6381-90020	All user documentation

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2 GPIB Command Dictionary

This is the GPIB command dictionary. It contains syntax and guidelines for the GPIB commands available in the Test Set.

If you know the name of the control field on the screen that you want to control programmatically, look that field's name up in the index of this guide. The index will guide you to the command that controls that field.

Notice

Using This Dictionary

This dictionary is arranged according to GPIB subsystem. Each subsystem contains syntax for a specific set of functions within the Test Set.

When using the electronic form of this guide, you can cut-and-paste the syntax into your programming code. It is set up especially for this purpose, and where possible, the syntax includes the limits or expected values for the command.

Description of Commands

The typical format of each entry is as follows:

```
root:branch1:branch2:branch3:command parameter !limits
root:branch1:branch2:branch3:command 'argument'
```

Equivalent Commands

Commands separated by a vertical bar | are equivalent. For example,

for the command AFG2|ENCoder:AMPS:BUSY 'Idle', either

AFG2:AMPS:BUSY 'Idle'

or

ENC:AMPS:BUSY 'Idle'

will set the AMPS encoder to the idle state.

Optional Commands

Commands enclosed in square brackets [ ] are optional. For example,

for the command AFG2|ENC:NAMP|NTAC[:FOCC]:AM 30 either

AFG2:NAMP:FOCC:AM 30

or

AFG2:NAMP:AM 30

will set the NAMPS encoder's data level on the forward control channel to AM. (Other combinations are possible with the above command.)

AFANalyzer subsystem

:AIN <string>
:AIN?

These commands set/query the input state of the AUDIO IN LO connector.

Syntax

```
AFAN:AIN 'Gnd'
         'Float'
         '600 to Hi'
AFAN:AIN?
```

Screen/field equivalent

AFAN:AIN sets the **Audio In Lo** field on the AF ANALYZER screen.

:DEMPhasis <string>
:DEMPhasis?

These commands set/query the state of the de-emphasis networks in the audio analyzer and speaker circuitry.

Syntax

```
AFAN:DEMP '750 us'
          'Off'
AFAN:DEMP?
```

Screen/field equivalent

AFAN:DEMP sets the **De-Emphasis** field on the AF ANALYZER screen.

:DEMPhasis:GAIN <string>
:DEMPhasis:GAIN?

These commands set/query the AF analyzer's amplifier gain. This command is only effective when autoranging is turned off using the AFAN:RANG 'Hold' command.

Gain is automatically set when the AFAN:RANG 'Auto' command is used. If autoranging is enabled (AFAN:RANG 'Auto') and you attempt to change the gain setting by sending the AFAN:DEMP:GAIN command, the value you send will be overridden by the autoranging function.

Syntax

```
AFAN:DEMP:GAIN '0 dB'
     '10 dB'
     '20 dB'
     '30 dB'
AFAN:DEMP:GAIN?
```

Screen/field equivalent

AFAN:DEMP:GAIN sets the **De-Emp Gain** field on the AF ANALYZER screen when the **Gain Cntl** field is set to **Hold**.

:DETector <string>
:DETector?

These commands set/query the type of detector used for AF signals.

Syntax

```
AFAN:DET 'RMS'
         'RMS*SQRT2'
         'PK+'
         'PK-'
         'PK+-/2'
         'PK+-MAX'
         'PK+ HOLD'
         'PK- HOLD'
         'PK+-/2 Hd'
         'PK+-MX Hd'
AFAN:DET?
```

Screen/field equivalent

AFAN:DET controls the **Detector** field on the AF ANALYZER screen.

:DETector:PKLocation <string>
:DETector:PKLocation?

These commands set/query the signal source for the peak detector measurements.

Syntax

```
AFAN:DET:PKL 'Filters'
             'De-Emp'
AFAN:DET:PKL?
```

Screen/field equivalent

AFAN:DET:PKL controls the **Pk Det To** field on the AF ANALYZER screen.

:DETector:SETTling <string>
:DETector:SETTling?

These commands set/query the settling time for audio measurements. (Use Fast when measuring signals greater than 200 Hz).

Syntax

```
AFAN:DET:SETT 'Fast'
              'Slow'
AFAN:DET:SETT?
```

Screen/field equivalent

AFAN:DET SETT controls the **Settling** field on the AF ANALYZER screen.

:ELResistor <real number>
:ELResistor?

These commands set/query the external load resistance for measurements using the AUDIO IN HI and LO connectors.

This command utilizes the “Real Number Setting Syntax” on page 208, but does not use the :STATe command.

Syntax

```
AFAN:ELR <real number> !valid from 1 ohm to 1 megohm
AFAN:ELR !returns the value in ohms
```

Screen/field equivalent

AFAN:ELR controls the **Ext Load R** field on the AF ANALYZER screen.

:FILT1 | FILTER1 <string>
:FILT1? | FILTER1?

These commands set/query the audio filter 1 selection.

Syntax

```
AFAN:FILT1 '<20Hz HPF'
           '50HZ HPF'
           '300Hz HPF'
           'C MESSAGE'
AFAN:FILT1?
```

Screen/field equivalent

AFAN:FILT1 controls the **`Filter 1`** field on the AF ANALYZER screen

:FILT2 | FILTER2 <string>
:FILT2? | FILTER2?

These commands set/query the audio filter 2 selection.

Syntax

```
AFAN:FILT2 '300Hz LPF'
           '3kHz LPF'
           '15kHz LPF'
           '>99kHz LP'
           '6kHz BPF'
AFAN:FILT2?
```

Screen/field equivalent

AFAN:FILT2 controls the **`Filter 2`** field on the AF ANALYZER screen.

:GTIMe <real number>
:GTIMe?

This command sets the gate time (how long the AF counter samples the input signal) for the audio frequency counter.

This command utilizes the “Real Number Setting Syntax” on page 208, but does not use the :STATe command.

Syntax

```
AFAN:GTIM <real number> !valid from 10 milliseconds to 1
second

AFAN:GTIM?
```

Screen/field equivalent

AFAN:GTIM controls the **AF Cnt Gate** field on the AF ANALYZER screen.

:INPut <string>
:INPut?

These commands set/query the input to the audio analyzer.

Syntax

```
AFAN:INP  'FM Demod'
          'AM Demod'
          'SSB Demod'
          'Audio In'
          'Ext Mod'
          'FM Mod'
  'AM Mod'
          'Audio Out'

AFAN:INP?
```

Screen/field equivalent

AFAN:INP controls the **AF Anl In** field on the AF ANALYZER screen.

:INPut:GAIN <string>
:INPut:GAIN?

These commands set/query the input gain setting for the audio analyzer. This command is only effective when autoranging is turned off using the AFAN:RANG ‘Hold’ command.

Gain is automatically set when the AFAN:RANG ‘Auto’ command is used. If autoranging is enabled (AFAN:RANG ‘Auto’) and you attempt to change the gain setting by sending the AFAN:INP:GAIN command, the value you send will be overridden by the autoranging function.

Syntax

```
AFAN:INP:GAIN ‘0 dB’
              ‘20 dB’
              ‘40 dB’
AFAN:INP:GAIN
```

Screen/field equivalent

AFAN:INP:GAIN controls the **Input Gain** field on the AF ANALYZER screen when the **Gain Cntl** field is set to **Hold**.

:NOTCh:GAIN <string>
:NOTCh:GAIN?

These commands set/query the gain of the AF analyzer's notch filter amplifier. This command is only effective when autoranging is turned off using the AFAN:RANG 'Hold' command.

Gain is automatically set when the AFAN:RANG 'Auto' command is used. If autoranging is enabled (AFAN:RANG 'Auto') and you attempt to change the gain setting by sending the AFAN:NOTC:GAIN command, the value you send will be overridden by the autoranging function.

Syntax

```
AFAN:NOTC:GAIN '0 dB'
               '10 dB'
               '20 dB'
               '30 dB'
               '40 dB'
AFAN:NOTC:GAIN?
```

Screen/field equivalent

AFAN:NOTC:GAIN controls the **Notch Gain** field on the AF ANALYZER screen when the **Gain Cntl** field is set to **Hold**.

:NOTCh:FREQuency <real number>
:NOTCh:FREQuency?

These commands set/query the center frequency for the variable frequency notch filter. This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
AFAN:NOTC:FREQ <real number> !valid 330 Hz to 10 kHz
AFAN:NOTC:FREQ?
```

Screen/field equivalent

AFAN:NOTC:FREQ controls the **Notch Freq** field on the AF ANALYZER screen.

:RANGing <string>
:RANGing?

These commands set/query the gain control mode of the AF analyzer.

Syntax

```
AFAN:RANG 'Auto'
          'Hold'
AFAN:RANG?
```

Screen/field equivalent

AFAN:RANG controls the **Gain Cntl** field on the AF ANALYZER screen.

:SMPoint <string>
:SMPoint?

These commands set/query the signal source for the oscilloscope.

Syntax

```
AFAN:SMP 'De-Emp'
         'Filters'
         'Input'
         'Notch'
AFAN:SMP?
```

Screen/field equivalent

AFAN:SMP controls the **Scope To** field on the AF ANALYZER screen.

:SPEaker:MODE <string>
:SPEaker:MODE?

These commands set/query the automatic level control (ALC) function for the instrument's internal speaker.

Syntax

```
AFAN:SPE:MODE 'On'
              'Off'
AFAN:SPE:MODE?
```

Screen/field equivalent

AFAN:SPE:MODE controls the **Speaker ALC** field on the AF ANALYZER screen.

:SPEaker:VOLume <string>
:SPEaker:VOLume?

These commands set/query the speaker volume, which is controlled by the Volume knob when 'Pot' is selected.

Syntax

```
AFAN:SPE:VOL 'Pot'
             'Off'
AFAN:SPE:VOL
```

Screen/field equivalent

AFAN:SPE:VOL controls the **Speaker Vol** field on the AF ANALYZER screen.

AFG1|AFGENERATOR1 subsystem

:AM <real number>
:AM?

This command sets AM modulation depth when the AFG1:DEST 'AM' is used first.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG1:AM <real number>

AFG1:AM? !returns the value of the amplitude modulation
```

Screen/field equivalent

AFG1:AM controls the **AFGen1 To** field (lower subfield) on the RF GENERATOR screen.

:DESTination <string>
:DESTination?

AFG1:DEST sets/queries the destination of AF generator 1's signal.

Syntax

```
AFG1:DEST 'AM'
          'FM'
           'Audio Out'

AFG1:DEST?
```

Screen/field equivalent

AFG1:DEST controls the **AFGen1 To** field (upper subfield) on the RF GENERATOR screen.

:FM <real number>
:FM?

This command sets FM modulation deviation when the AFG1:DEST 'FM' command is used.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG1:FM <real number>

AFG1:FM?
```

Screen/field equivalent

AFG1:FM controls the **AFGen1 To** field (lower subfield) on the RF GENERATOR screen.

:FREQuency <real number>
:FREQuency?

This command set the frequency of audio frequency generator 1.

This command utilizes the "Real Number Setting Syntax" on page 208, not including the :STATe command.

Syntax

```
AFG1:FREQ <real number>

AFG1:FREQ
```

Screen/field equivalent

AFG1:FREQ controls the **AFGen1 Freq** field on the RF GENERATOR screen.

:OUTPut <real number>
:OUTPut?

This command sets the amplitude of the audio signal (volts rms) at the AUDIO OUT connector if the AFG1:DEST is 'Audio Out'.

This command utilizes the "Real Number Setting Syntax" on page 208

Syntax

```
AFG1:OUTP <real number>

AFG1:OUTP?
```

Screen/field equivalent

AFG1:OUTP controls the **AFGen1 To** field (lower subfield) on the RF GENERATOR screen.

AFG2|ENCoder subsystem

:AM <real number>
:AM?

This command sets AM modulation depth if the command AFG2:DEST 'AM' is used first.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AM <real number>

AFG2:AM? !returns the value of the amplitude modulation
```

Screen/field equivalent

AFG2:AM controls the **AFGen2 To** field (lower subfield) on the RF GENERATOR screen when the upper subfield is set to **AM**.

:BURSt <integer>
:BURSt?

These commands set/query the number of times the message data is output. To use this function, the AFG2:SEND:MODE command must specify 'Burst' first.

This command uses only the :INCR command of the "Integer Number Setting Syntax" on page 162.

Syntax

```
AFG2:BURS <integer>

AFG2:BURS?
```

Screen/field equivalent

AFG2:BURS controls the **Bursts** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**, **AMPS-TACS**, or **NAMP-NTAC**.

:DESTination <string>
:DESTination?

:DEST sets/queries the destination of the AF generator 2's signal.

Syntax

```
AFG2:DEST 'AM'
          'FM'
         'Audio Out'
AFG2:DEST?
```

Screen/field equivalent

AFG2:DEST controls the **AFGen2 To** field (upper subfield) on the RF GENERATOR screen.

:FILTer <string>
:FILTer?

To improve performance, one of four premodulation filters is *automatically* selected for each encoder mode. The automatically selected filter can be changed only by using GPIB commands.

We recommend that you leave this setting at its automatically selected setting.

If it is necessary to override the automatic settings, the AFG2:FILT:MODE 'ON' command must be executed first (filter mode OFF is the power up default state). The following error will occur if the user attempts to select an alternate filter without first setting the filter mode to ON: **`Entry not accepted.`** The syntax to change or query the premodulation filter is shown in the example below.

Syntax

```
AFG2:FILT 'None'
          '20 kHzLPF'
          '250 HzLPF'
          '150 HzLPF'
AFG2:FILT?
```

Example

```
AFG2:FILT:MODE 'ON' !turn filter selection mode on
AFG2:FILT:MODE? !query the current mode setting
AFG2:FILT 'NONE|20kHz LPF|250Hz LPF|150Hz LPF'
  !select one to change the setting
AFG2:FILT? !query the new filter setting
```

Screen/field equivalent

AFG2:FILT has no screen/field equivalent.

:FILTer:MODE <string>
:FILTer:MODE?

These commands set/query the premodulation filter's control.

We recommend that you leave this setting at its default setting (filter mode OFF is the power up default state). See the :FILTer command on page 55 for more information about the premodulation filters.

Syntax

```
AFG2:FILT:MODE 'ON'
               'OFF'
AFG2:FILT:MODE?
```

Screen/field equivalent

AFG2:FILT:MODE has no screen/field equivalent.

:FM <real number>
:FM?

This command sets FM modulation deviation if the AFG2:DEST is 'FM'.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:FM <real number>
AFG2:FM?
```

Screen/field equivalent

AFG2:FM controls the **AFGen2 To** field (lower subfield) on the RF GENERATOR screen when the upper subfield is set to **FM**.

:FREQuency <real number>
:FREQuency?

This command set/queries the output frequency of AF generator 2.

This command utilizes the “Real Number Setting Syntax” on page 208, but does not use the :STATe command.

Syntax

```
AFG2:FREQ <real number>

AFG2:FREQ
```

Screen/field equivalent

AFG2:FREQ controls the **AFGen2 Freq** field on the RF GENERATOR screen.

:MODE <string>

This command sets the type of signaling encoder.

Syntax

```
AFG2:MODE 'Func Gen'
          'DTMF'
          'AMPS-TACS'
          'NAMP-NTAC'

AFG2:MODE?
```

Screen/field equivalent

AFG2:MODE controls the **Mode** field on the SIGNALING ENCODER screen.

:OUTPut <real number>
:OUTPut?

This command sets the amplitude of the audio signal (volts rms) at the AUDIO OUT connector if the AFG2:DEST is 'Audio Out'.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:OUTP <real number>

AFG2:OUTP?
```

Screen/field equivalent

AFG2:OUT controls the **AFGen2 To** field (lower subfield) on the RF GENERATOR screen when the upper subfield is set to **Audio Out**.

:PEMPhasis <string>
:PEMPhasis?

This command sets pre-emphasis filters for the DTMF encoder.

Syntax

```
AFG2:PEMP 'On'
          'Off'

AFG2:PEMP?
```

Screen/field equivalent

AFG2:PEMP controls the **Pre-Emp** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:POLarity <string>
:POLarity?

This command causes the digitally modulated signals to be sent with a normal or inverted response to the digital data. When Inverted, a digital 1 produces a frequency shift in an FM carrier opposite to normal operation.

Syntax

```
AFG2:POL   'Norm'
           'Invert'
AFG2:POL?
```

Screen/field equivalent

AFG2:POL controls the **Polarity** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** or **NAMP-NTAC**.

:SEND:MODE <string>
:SEND:MODE?

These commands set/query the mode used when a message is sent.

- 'Single' outputs the entire message once.
- 'Burst' outputs the message the number of times specified by the AFG2:BURS command.
- 'Cont' outputs the message continuously until the AFG2:STOP command is sent.
- 'Step' outputs a single step in an encoder sequence each time the AFG2:SEND command is sent. After the entire sequence is output, the encoder returns to the first character in the sequence.

Syntax

```
AFG2:SEND:MODE  'Single'
                'Burst'
                'Cont'
                'Step'
AFG2:SEND:MODE?
```

Screen/field equivalent

AFG2:SEND:MODE controls then **Send Mode** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**, **NAMP-NTAC**, or **DTMF**.

:SEND

This command sends the encoder data stream'.

Syntax

```
AFG2:SEND
```

Screen/field equivalent

AFG2:SEND controls the **Send** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS–TACS**, **NAMP–NTAC**, or **DTMF**.

:STOP

This command stops the data stream that is being output when AFG2:SEND:MODE is 'Cont' or 'Burst'.

Syntax

```
AFG2:STOP
```

Screen/field equivalent

AFG2:STOP controls the **Stop** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS–TACS**, **NAMP–NTAC**, or **DTMF**.

:AMPS|TACS:BUSY <string>
:AMPS|TACS:BUSY?

These commands set/query the busy/idle status information included in the signaling sequence.

- 'Idle' sets the busy/idle bits of the forward control channel information to indicate an idle state.
- 'Busy' sets the busy/idle bits of the forward control channel information to indicate an busy state.
- 'WS Delay' (word sync delay) prevents a busy/idle change until the word sync information has been received and a defined number of delay bits has been counted. The delay is set with the AFG2:AMPS:BUSY:DEL command.
- '1stBitDly' (first bit delay) causes the busy/idle bit to be set after a bit has been received and a defined number of delay bits has been counted. The delay is set with the AFG2:AMPS:BUSY:DEL command.

This command requires that the AFG2:AMPS:CHAN command specifies 'Cntl'.

Syntax

```
AFG2:AMPS:BUSY 'Idle'
               'Busy'
               'WS Delay
               '1stBitDly'
AFG2:AMPS:BUSY?
```

Screen/field equivalent

AFG2:AMPS:BUSY controls the **Busy/Idle** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Cntl**.

:AMPS|TACS:BUSY:DELay <integer>

These commands set/query the number of bits that are counted before a busy/idle bit changes from the idle state to the busy state. This function is used in conjunction with the WS Delay and 1stBitDly settings of the AFG2:AMPS|TACS:BUSY command. This command also requires that the AFG2:AMPS:CHAN command is specifies 'Cntl'.

This command utilizes only the :INCR command of the "Integer Number Setting Syntax" on page 162.

Syntax

```
AFG2:AMPS:BUSY:DEL <real number>
```

Screen/field equivalent

AFG2:AMPS:BUSY:DEL controls the **B/I Delay** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS and the Channel field is set to Cntl**.

:AMPS|TACS:CHANnel <string>
:AMPS|TACS:CHANnel?

These commands set/query the channel type. 'Cntl' selects the forward control channel (FOCC). 'Voice' selects the forward voice channel (FVC).

Syntax

```
AFG2:AMPS:CHAN 'Cntl'
               'Voice'
AFG2:AMPS:CHAN?
```

Screen/field equivalent

AFG2:AMPS:CHAN controls the **Channel** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:DATA:AM <real number>
:AMPS|TACS:DATA:AM?

These commands set/query the data level when the AFG2:DEST 'AM' command is used first. The data level units are %.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AMPS:DATA:AM

AFG2:AMPS:DATA:AM?
```

Screen/field equivalent

AFG2:AMPS:DATA:AM controls the **Data Level** field when **AFGen2 To** field is set to **AM** on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:DATA:FM <real number>
:AMPS|TACS:DATA:FM?

These commands set/query the data level when the AFG2:DEST 'FM' command is used. The data level units are kHz.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AMPS:DATA:FM

AFG2:AMPS:DATA:FM?
```

Screen/field equivalent

AFG2:AMPS:DATA:FM controls the **Data Level** field when **AFGen2 To** field is set to **FM** on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:DATA:LEVel <real number>
:AMPS|TACS:DATA:LEVel?

These commands set/query the data level when the AFG2:DEST 'Audio Out' command is used first. The data level units are mV.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AMPS:DATA:LEV

AFG2:AMPS:DATA:LEV?
```

Screen/field equivalent

AFG2:AMPS:DATA:LEV controls the **Data Level** field when **AFGen2 To** field is set to **Audio Out** on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:DATA:RATE <real number>

These commands set/query the data rate of the encoded message.

This command utilizes the "Real Number Setting Syntax" on page 208 but does not use the :STATe command.

Syntax

```
AFG2:AMPS:DATA:RATE
```

Screen/field equivalent

AFG2:AMPS:DATA:RATE controls the **Data Rate** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:FILLer:DATA1 <string>
:AMPS|TACS:FILLer:DATA2 <string>
:AMPS|TACS:FILLer:DATA1?
:AMPS|TACS:FILLer:DATA2?

These commands set/query FOCC filler data. Each filler contains 7 hexadecimal characters representing the 2 type bits and 26 information bits of the control filler/message word. The control filler is sent continuously when the :AMPS|TACS:FILL:SEND command is used or after a control message has been sent using :AMPS|TACS:SEND.

Both filler fields must be full (seven digits) for the forward control channel information to be structured correctly. Do not leave any blank spaces.

To use this command, AFG2:AMPS:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:AMPS:FILL:DATA1 <string>

AFG2:AMPS:FILL:DATA2 <string>

AFG2:AMPS:FILL:DATA1?

AFG2:AMPS:FILL:DATA2?
```

Screen/field equivalent

AFG2:AMPS:FILL:DATA1 and DATA 2 control the **Filler** fields for Stream A and Stream B on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Cntl**.

:AMPS|TACS:FILLer:SEND

This command sends the filler information that is entered with the AFG2:FILL:DATA1 and AFG2:FILL:DATA2 commands.

To use this command, AFG2:AMPS:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:AMPS:FILL:SEND
```

Screen/field equivalent

AFG2:AMPS:FILL:SEND controls the **Send Filler** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Cntl**.

:AMPS|TACS:FILLer:STOP

This command stops the output of filler data.

To use this command, AFG2:AMPS:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:AMPS:FILL:STOP
```

Screen/field equivalent

AFG2:AMPS:FILL:STOP controls the **Stop Filler** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Cntl**.

:AMPS|TACS:FVCMessage <string>
:AMPS|TACS:FVCMessage?

These commands set/query the 7 hexadecimal characters representing the 2 type bits and 26 information bits in the forward voice channel (FVC) message word. All seven characters must be present (with no blank spaces) for the message to be valid. The SAT is turned off while the FVC message stream is sent.

This command is used with the AFG2:AMPS:CHAN 'Voice' command.

Syntax

```
AFG2:AMPS:FVCM <string>

AFG2:AMPS:FVCM?
```

Screen/field equivalent

AFG2:AMPS:FVCM controls the **Message** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Voice**.

:AMPS|TACS:MESSage:DATA1 <string>
:AMPS|TACS:MESSage:DATA2 <string>
:AMPS|TACS:MESSage:DATA1?
:AMPS|TACS:MESSage:DATA2?

These commands set/query FOCC Stream A and Stream B message data. Like the filler data, the message information can only be input in full (seven digit) lines. Also, message streams A and B must have the same number of lines in them.

To use this command, AFG2:AMPS:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:AMPS:MESS:DATA1 <string>

AFG2:AMPS:MESS:DATA2 <string>

AFG2:AMPS:MESS:DATA1?

AFG2:AMPS:MESS:DATA2?
```

Screen/field equivalent

AFG2:AMPS:MESS controls the **Message** fields for FOCC Stream A and Stream B on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**. These fields are displayed only when the **Channel** field is set to **Cntl**.

:AMPS|TACS:SAT:AM <real number>
:AMPS|TACS:SAT:AM?

These commands set/query the SAT level when the AFG2:DEST 'AM' and AFG2:AMPS:CHAN 'Voice' commands are used. The SAT level units are %.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AMPS:SAT:AM
```

Screen/field equivalent

AFG2:AMPS:SAT:AM controls the **SAT Level** field when **AFGen2 To** field is set to **AM** on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Voice**.

:AMPS|TACS:SAT:FM <real number>
:AMPS|TACS:SAT:FM?

These commands set/query the SAT level when the AFG2:DEST 'FM' and AFG2:AMPS:CHAN 'Voice' commands are used. The SAT level's units are kHz.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AMPS:SAT:FM
```

Screen/field equivalent

AFG2:AMPS:SAT:FM controls the **SAT Level** field when **AFGen2 To** field is set to **FM** on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS and the Channel field is set to Voice**.

:AMPS|TACS:SAT:LEVel <real number>
:AMPS|TACS:SAT:LEVel

These commands set/query the SAT level when the AFG2:DEST 'Audio Out' and AFG2:AMPS:CHAN 'Voice' commands are used. The SAT level units are mV.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:AMPS:SAT:LEV
```

Screen/field equivalent

AFG2:AMPS:SAT:LEV controls the **SAT Level** field when **AFGen2 To** field is set to **Audio Out** on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Voice**.

:AMPS|TACS:SAT:FREQuency <real number>

These commands set/query the supervisory audio tone's frequency. This signal is sent continuously whenever AFG2:AMPS:CHAN 'Voice' is used, but is interrupted when a FVC message is sent.

This command utilizes the "Real Number Setting Syntax" on page 208 but does not use the :STATe command.

Syntax

```
AFG2:AMPS:SAT:FREQ
```

Screen/field equivalent

AFG2:AMPS:SAT:FREQ controls the **SAT Freq** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS** and the **Channel** field is set to **Voice**.

:AMPS|TACS:STANdard <string>
:AMPS|TACS:STANdard?

These commands set/query the radio standard for the encoder.

Syntax

```
AFG2:AMPS:STAN 'AMPS'
               'TACS'
               'JTACS'
AFG2:AMPS:STAN?
```

Screen/field equivalent

AFG2:AMPS:STAN controls the **Standard** field on the SIGNALING ENCODER screen when the **Mode** field is set to **AMPS-TACS**.

:DTMF:FREQuency:COLumn <multiple real number>
:DTMF:FREQuency:COLumn?

These commands set/query the frequencies for the vertical columns in the symbol frequencies table of the DTMF encoder.

Syntax

```
AFG2:DTMF:FREQ:COL <integer value>,<real number>
```

```
AFG2:DTMF:FREQ:COL? <integer value>
```

Screen/field equivalent

AFG2:DTMF:FREQ:COL controls vertical columns in the **Symbol Frequencies (Hz)**: table on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:DTMF:FREQuency:ROW <multiple real number>
:DTMF:FREQuency:ROW?

These commands set/query the frequencies for the horizontal rows in the symbol frequencies table of the DTMF encoder.

Syntax

```
AFG2:DTMF:FREQ:ROW <integer value>,<real number>
```

```
AFG2:DTMF:FREQ:ROW? <integer value>
```

Screen/field equivalent

AFG2:DTMF:FREQ:ROW controls horizontal rows in the **Symbol Frequencies (Hz)**: table on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:DTMF:OFFTime <real number>
:DTMF:OFFTime?

These commands set/query the length of time each DTMF tone is off during the sequence.

Syntax

```
AFG2:DTMF:OFFT <real number>
```

Screen/field equivalent

AFG2:DTMF:OFFT controls the **Off Time** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:DTMF:ONTime <real number>
:DTMF:ONTime?

These commands set/query the length of time each DTMF tone is on during the sequence.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
AFG2:DTMF:ONT <real number>
```

Screen/field equivalent

AFG2:DTMF:ONT controls the **On Time** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:DTMF:SEQuence <string>
:DTMF:SEQuence?

These commands set/query the sequence of tones output by the signaling encoder.

Syntax

```
AFG2:DTMF:SEQ <string>

AFG2:DTMF:SEQ?
```

Screen/field equivalent

AFG2:DTMF:SEQ controls the **Sequence** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:DTMF:STANdard <string>
:DTMF:STANdard?

These commands set/query the standard applied to the encoded data. The standard affects the types of frames that can be sent, the range of valid channel numbers, the encoding of the frame data, and the interpretation of received frames.

Syntax

```
AFG2:DTMF:STAN 'Bell'

AFG2:DTMF:STAN?
```

Screen/field equivalent

AFG2:DTMF:STAN controls the **Standard** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:DTMF:TWISt <real number>
:DTMF:TWISt?

These commands set/query the ratio of amplitudes (in dB) between the high frequency and low frequency tone in each DTMF pair. A positive twist value indicates a higher amplitude for the high frequency tone. A negative value indicates a higher amplitude for the low frequency tone.

Twist and pre-emphasis affect the relative levels of the high and low tones within each symbol (tone pair). See the “Twist and Pre-emphasis” in the *Reference Guide* for details about the interactions of twist and pre-emphasis.

This command utilizes the “Real Number Setting Syntax” on page 208, but does not use the :INCR or :STATe commands.

Syntax

```
AFG2:DTMF:TWIS <real number>

AFG2:DTMF:TWIS?
```

Screen/field equivalent

AFG2:DTMF:TWIS controls the **Twist** field on the SIGNALING ENCODER screen when the **Mode** field is set to **DTMF**.

:FGENerator:SUNits <string>
:FGENerator:SUNits?

These commands set/query whether the signal’s output is in units of rms or peak. The AFG2:DEST ‘Audio Out’ command must be used with this command.

Syntax

```
AFG2:FGEN:SUN 'RMS'
              'Peak'

AFG2:FGEN:SUN?
```

Screen/field equivalent

AFG2:FGEN:WAV controls the **Sine Units** field on the SIGNALING ENCODER screen when the **Mode** field is set to **Func Gen** and the **AFGen2 To** field is set to **Audio Out**.

:FGENerator:WAVeform <string>
:FGENerator:WAVeform?

These commands set/query the type of waveform generated by the function generator.

Syntax

```
AFG2:FGEN:WAV 'Sine'
              'Square'
              'Triangle'
              'Ramp(+)' !Positive-going ramp
              'Ramp(-)' !Negative-going ramp
              'DC(+)'
              'DC(-)'
              'Uni Noise' !Universal noise
              'Gau Noise' !Gaussian noise
AFG2:FGEN:WAV?
```

Screen/field equivalent

AFG2:FGEN:WAV controls the **Waveform** field on the SIGNALING ENCODER screen when the **Mode** field is set to **Func Gen**.

:NAMPs|NTACs:BUSY <string>
:NAMPs|NTACs:BUSY?

These commands set/query the busy/idle status information included in the signaling sequence.

- 'Idle' sets the busy/idle bits of the forward control channel information to indicate an idle state.
- 'Busy' sets the busy/idle bits of the forward control channel information to indicate an busy state.
- 'WS Delay' (word sync delay) prevents a busy/idle change until the word sync information has been received and a defined number of delay bits has been counted. The delay is set with the AFG2:NAMPS:BUSY:DEL command.
- '1stBitDly' (first bit delay) causes the busy/idle bit to be set after a bit has been received and a defined number of delay bits has been counted. The delay is set with the AFG2:NAMPS:BUSY:DEL command.

This command requires that the AFG2:NAMPS:CHAN command specifies 'Cntl'.

Syntax

```
AFG2:NAMP:BUSY 'Idle'
               'Busy'
               'WS Delay
               '1stBitDly'
AFG2:NAMP:BUSY?
```

Screen/field equivalent

AFG2:NAMP:BUSY controls the **Busy/Idle** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC** and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs:BUSY:DELay <integer>

These commands set/query the number of bits that are counted before a busy/idle bit changes form the idle state to the busy state. This function is used in conjunction with the WS Delay and 1stBitDly settings of the :NAMPs|NTACs:BUSY command.

This command utilizes only the :INCR command of the "Integer Number Setting Syntax" on page 162.

Syntax

```
AFG2:NAMP:BUSY:DEL <real number>
```

Screen/field equivalent

AFG2:NAMP:BUSY:DEL controls the **B/I Delay** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC** and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs:CHANnel <string>
:NAMPs|NTACs:CHANnel?

These commands set/query the channel type. 'Cntl' selects the forward control channel (FOCC). 'Voice' selects the forward voice channel (FVC).

Syntax

```
AFG2:NAMP:CHAN 'Cntl'
               'Voice'
AFG2:NAMP:CHAN?
```

Screen/field equivalent

AFG2:NAMP:CHAN controls the **Channel** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**.

:NAMPs|NTACs:DSAT:MESS <string>
:NAMPs|NTACs:DSAT:MESS?

These commands set/query the 24-bit digital supervisory audio tone (DSAT) sequence. The seven standard sequences are: 2556CB, 255B2B, 256A9B, 25AD4D, 26AB2B, 26B2AD, and 2969AB. (These codes are the inverse of the seven DST codes.)

DSAT is output continuously when AFG2:NAMP:DSAT:SEND is sent. It is only stopped when AFG2:NAMP:DSAT:STOP is sent, or when the DST message stream is sent.

Syntax

```
AFG2:NAMP:DSAT:MESS <string>
```

Screen/field equivalent

AFG2:NAMP:DSAT:MESS controls the FVC **DSAT** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:DSAT:SEND <string>

This command sends the 24-bit digital supervisory audio tone (DSAT) sequence. DSAT is output continuously when AFG2:NAMP:DSAT:SEND is sent. It is only stopped when AFG2:NAMP:DSAT:STOP is sent, or when a message or DST is sent. If a message or DST is sent, the DSAT data is output *after* the message is output.

Syntax

```
AFG2:NAMP:DSAT:SEND
```

```
AFG2:NAMP:DSAT:SEND?
```

Screen/field equivalent

AFG2:NAMP:DSAT:SEND controls the FVC **Send DSAT** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:DSAT:STOP

If a DSAT is being sent, this command stops the DSAT. See ":NAMPs|NTACs:DSAT:SEND <string>" on page 76.

Syntax

```
AFG2:NAMP:DSAT:STOP
```

Screen/Field Equivalent

AFG2:NAMP:DSAT:STOP controls the **Stop DSAT** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs[:FOCC]:AM <real number>
:NAMPs|NTACs[:FOCC]:AM?

This command sets/queries the data level when the AFG2:DEST 'AM' command is used. The data level units are %.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:NAMP:FOCC:AM
```

```
AFG2:NAMP:FOCC:AM?
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:AM controls the **Data Level** field when **AFGen2 To** field is set to **AM** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs[:FOCC]:FM <real number>
:NAMPs|NTACs[:FOCC]:FM?

This command sets/queries the data level when the AFG2:DEST 'FM' command is used. The data level units are kHz.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:NAMP:FOCC:FM
```

```
AFG2:NAMP:FOCC:FM?
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:FM controls the **Data Level** field when **AFGen2 To** field is set to **FM** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs[:FOCC]:LEVel <real number>
:NAMPs|NTACs[:FOCC]:LEVel?

These commands set/query the data level when the AFG2:DEST 'Audio Out' command is used. The data level units are mV.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:NAMP:FOCC:LEV

AFG2:NAMP:FOCC:LEV?
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:LEV controls the **Data Level** field when **AFGen2 To** field is set to **Audio Out** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs[:FOCC]:RATE <real number>
:NAMPs|NTACs[:FOCC]:RATE?

These commands set/query the data rate of the encoded message.

This command utilizes the "Real Number Setting Syntax" on page 208 but does not use the :STATe command.

Syntax

```
AFG2:NAMP:FOCC:RATE

AFG2:NAMP:FOCC:RATE?
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:RATE controls the **Data Rate** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs[:FOCC]:FILLer:DATA1 <string>
:NAMPs|NTACs[:FOCC]:FILLer:DATA2 <string>
:NAMPs|NTACs[:FOCC]:FILLer:DATA1?
:NAMPs|NTACs[:FOCC]:FILLer:DATA2?

These commands set/query FOCC filler data. Each filler contains 7 hexadecimal characters representing the 2 type bits and 26 information bits of the control filler/message word. The control filler is sent continuously when the :NAMPs|NTACs[:FOCC]:FILL:SEND command is used or after a control message has been sent using :NAMPs|NTACs:SEND.

Both filler fields must be full (seven digits) for the forward control channel information to be structured correctly. Do not leave any blank spaces.

To use this command, AFG2:NAMP:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:NAMP[:FOCC]:FILL:DATA1 <string>

AFG2:NAMP[:FOCC]:FILL:DATA2 <string>

AFG2:NAMP[:FOCC]:FILL:DATA1?

AFG2:NAMP[:FOCC]:FILL:DATA2?
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:FILL:DATA1 and DATA 2 control the **Filler** fields for Stream A and Stream B on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs[:FOCC]:FILLer:SEND

This command sends the filler information that is entered with the AFG2:FILL:DATA1 and AFG2:FILL:DATA2 commands.

To use this command, AFG2:NAMP:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:NAMP[:FOCC]:FILL:SEND
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:FILL:SEND controls the **Send Filler** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPs|NTACs[:FOCC]:FILLer:STOP

This command stops the output of filler data.

To use this command, AFG2:NAMP:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:NAMP[:FOCC]:FILL:STOP
```

Screen/field equivalent

AFG2:NAMP[:FOCC]:FILL:STOP controls the **Stop Filler** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

:NAMPS|NTACS[:FOCC]:MESSage:DATA1 <string>
:NAMPS|NTACS[:FOCC]:MESSage:DATA2 <string>
:NAMPS|NTACS[:FOCC]:MESSage:DATA1?
:NAMPS|NTACS[:FOCC]:MESSage:DATA2?

These commands set/query FOCC Stream A and Stream B message data. Like the filler data, the message information can only be input in full (seven digit) lines. Also, message streams A and B must have the same number of lines in them.

To use this command, AFG2:NAMP:CHAN must be set to 'Cntl'.

Syntax

```
AFG2:NAMP[:FOCC]:MESS:DATA1 <string>

AFG2:NAMP[:FOCC]:MESS:DATA2 <string>

AFG2:NAMP[:FOCC]:MESS:DATA1?

AFG2:NAMP[:FOCC]:MESS:DATA2?
```

Screen/field equivalent

AFG2:NAMP:MESS controls the **Message** fields for FOCC Stream A and Stream B on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**. These fields are displayed only when the **Channel** field is set to **Cntl**.

:NAMPs|NTACs:FVC:MESS <string>
:NAMPs|NTACs:FVC:MESS?

These commands set/query the seven hexadecimal characters (28 bits) of the FVC message. These 7 characters are combined with 12 parity bits calculated by the encoder to output a 40-character data stream. This data is output when the AFG2:NAMP:FVC:SEND 'Message' command is sent.

The entire field must contain data. No blank spaces are allowed. The DSAT is turned off while the FVC message stream is sent.

Syntax

```
AFG2:NAMP:FVC:MESS <string>

AFG2:NAMP:FVC:MESS?
```

Screen/field equivalent

AFG2:NAMP:FVC:MESS controls the FVC **Message** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:FVC:RATE <real number>
:NAMPs|NTACs:FVC:RATE?

These commands set/query the data rate of the encoded message.

This command utilizes the "Real Number Setting Syntax" on page 208 but does not use the :STATe command.

Syntax

```
AFG2:NAMP:FVC:RATE <real number>

AFG2:NAMP:FVC:RATE?
```

Screen/field equivalent

AFG2:NAMP:FVC:RATE controls the **Data Rate** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:FVC:AM <real number>
:NAMPs|NTACs:FVC:AM?

This command sets/queries the data level when the AFG2:DEST 'AM' command is used. The data level units are %.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:NAMP:FVC:AM

AFG2:NAMP:FVC:AM?
```

Screen/field equivalent

AFG2:NAMP:FVC:AM controls the **Data Level** field when **AFGen2 To** field is set to **AM** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:FVC:FM <real number>
:NAMPs|NTACs:FVC:FM?

This command sets/queries the data level when the AFG2:DEST 'FM' command is used. The data level units are kHz.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:NAMP:FVC:FM

AFG2:NAMP:FVC:FM?
```

Screen/field equivalent

AFG2:NAMP:FVC:FM controls the **Data Level** field when **AFGen2 To** field is set to **FM** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:FVC:LEVel <real number>
:NAMPs|NTACs:FVC:LEVel?

These commands set/query the data level when the AFG2:DEST 'Audio Out' command is used. The data level units are mV.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
AFG2:NAMP:FVC:LEV

AFG2:NAMP:FVC:LEV?
```

Screen/field equivalent

AFG2:NAMP:FVC:LEV controls the **Data Level** field when **AFGen2 To** field is set to **Audio Out** on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:SEND
:NAMPs|NTACs:SEND?

This command sets/queries the type of data sent when the AFG2:SEND command is used.

- Selecting 'Message' sends the contents of the forward voice message (AFG2:NAMP:FVC:MESS <string>).
- Selecting 'DST' causes the digital signaling tone sequence to be output. The DST sequence that is sent is the inverse of the sequence entered in the DSAT message (AFG2:DSAT:MESS <string>).

Syntax

```
AFG2:NAMP:FVC:SEND 'Message'
                   'DST'

AFG2:NAMP:FVC:SEND?
```

Screen/Field Equivalent

AFG2:NAMP:FVC:SEND controls the FVC **Message/DST** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP-NTAC** and the **Channel** field is set to **Voice**.

:NAMPS|NTACS:STANdard <string>
:NAMPS|NTACS:STANdard?

These commands set/query the radio standard for the encoder.

Syntax

```
AFG2:NAMP:STAN 'NAMPS'
               'NTACS'
AFG2:NAMP:STAN?
```

Screen/field equivalent

AFG2:NAMP:STAN controls the **Standard** field on the SIGNALING ENCODER screen when the **Mode** field is set to **NAMP–NTAC**.

CDPD subsystem

The CDPD subsystem is not fully programmable over GPIB. For optimal CDPD measurement performance, use the Agilent Technologies CDPD software.

CONFigure subsystem

The CONFigure subsystem contains commands that control several different screens: I/O CONFIGURE, INSTRUMENT CONFIGURE, and PRINTER CONFIGURE.

:BADDress <integer>
:BADDerss?

These commands set/query the GPIB address for the Test Set. This command utilizes the "Integer Number Setting Syntax" on page 162.

Syntax

```
CONF:BADD <integer>  !valid from 0 to 30

CONF:BADD?
```

Screen/field equivalent

CONF:BADD controls the **GPIB Adrs** field of the I/O CONFIGURE screen.

:BEEPer <string>
:BEEPer?

These commands set/query the volume of the Test Set's beeper.

Syntax

```
CONF:BEEP 'Off'
          'Quiet'
          'Loud'

CONF:BEEP?
```

Screen/field equivalent

CONF:BEEP controls the **Beeper** field of the INSTRUMENT CONFIGURE screen.

:BMODe <string>
:BMODe?

These commands set/query the GPIB control mode.

Syntax

```
CONF:BMOD 'Control'
          'Talk&Lstn'
CONF:BMOD?
```

Screen/field equivalent

CONF:BMOD controls the **Mode** field of the I/O CONFIGURE screen.

:DISPlay:MESSages
:DISPlay:MESSages?

These commands set/query the reporting of messages during normal operation. A 'Yes' setting means that all messages are displayed as they occur.

Syntax

```
CONF:DISP:MESS 'Yes'
               'No'
CONF:DISP:MESS
```

Screen/field equivalent

CONF:DISP:MESS controls the **Display User Messages** field of the INSTRUMENT CONFIGURE screen.

:DATE <integer>
:DATE?

These commands set/query the date set within theTest Set. This command utilizes the "Integer Number Setting Syntax" on page 162.

Syntax

```
CONF:DATE <integer> !Use MMDDYY format
CONF:DATE?
```

Screen/field equivalent

CONF:DATE controls the **Date** field of the INSTRUMENT CONFIGURE screen.

:KNOB <string>
:KNOB?

This command is the equivalent of the pressing the cursor-control knob.

Syntax

```
CONF:KNOB 'On'
          'Off'
CONF:KNOB?
```

Screen/field equivalent

CONF:KNOB has no field associated with this command.

:NOTChmode <string>
:NOTChmode?

These commands set/query the coupling between the AF Generator 1 and a notch filter. The frequency and gain of the notch filter is set by the AFAN:NOTC:GAIN and AFAN:NOTC:FREQ commands.

Syntax

```
CONF:NOTC 'AFGen1' !notch filter switched in
          'None'  !no notch filter
CONF:NOTC?
```

Screen/field equivalent

CONF:NOTC controls the **`Notch Coupl`** field of the INSTRUMENT CONFIGURE screen.

:OFLevel:MODE <string>
:OFLevel:MODE?

These commands set/query the RF level offset, and is typically used to compensate for path loss between the Test Set and the base station.

Syntax

```
CONF:OFL:MODE 'On'
              'Off'
CONF:OFL:MODE?
```

Screen/field equivalent

CONF:OFL:MODE controls the **`RF Level Offset`** field of the INSTRUMENT CONFIGURE screen.

:OFLevel:ANTenna <real number>
:OFLevel:ANTenna?

These commands set/query the path loss from the device-under-test to the Test Set's ANT IN port. This correction is applied when the CONF:OFL:MODE 'On' command is used.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
CONF:OFL:ANT <real number> !values: –100.0 to 100.0

CONF:OFL:ANT?
```

Screen/field equivalent

CONF:OFL:ANT controls the **Antenna In** field of the INSTRUMENT CONFIGURE screen. This value in this field is used when the **RF Level Offset** field is set to **On**.

:OFLevel:DUPLex <real number>
:OFLevel:DUPLex?

These commands set/query the path loss from the DUPLEX OUT connector to the device-under-test. This correction is applied when the CONF:OFL:MODE 'On' command is used.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
CONF:OFL:DUPL <real number> !values: –100.0 to 100.0

CONF:OFL:DUPL?
```

Screen/field equivalent

CONF:OFL:DUPL controls the **Duplex Out** field on the INSTRUMENT CONFIGURE screen. This value in this field is used when the **RF Level Offset** field is set to **On**.

:OFLevel:RFINout <real number>
:OFLevel:RFINout?

These commands set/query the path loss from the RF IN/OUT connector to the device-under-test. This correction is applied when the CONF:OFL:MODE 'On' command is used.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
CONF:OFL:RFIN <real number> !values: minus 100.0 to 100.0

CONF:OFL:RFIN?
```

Screen/field equivalent

CONF:OFL:RFIN controls the **RF In/Out** field of the INSTRUMENT CONFIGURE screen. This value in this field is used when the **RF Level Offset** field is set to **On**.

:OFRequency <real number>
:OFRequency?

These commands set/query the frequency offset between the Test Set's generator and analyzer. This command is used only in frequency tuning mode (CONF:RFD 'Freq') and RF offset must be turned on (CONF:OMODE 'On').

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
CONF:OFR <real number>

CONF:OFR?
```

Screen/field equivalent

CONF:OFR controls the **(Gen)–(Anl)** field of the INSTRUMENT CONFIGURE screen.

:OMODe <string>
:OMODe?

These commands set/query the state of the RF offset defined in the CONF:OFR command.

Syntax

```
CONF:OMOD 'On'
          'Off'
CONF:OMOD?
```

Screen/field equivalent

CONF:OMOD controls the **RF Offset** field of the INSTRUMENT CONFIGURE screen.

:OPERation:AUTO
:OPERation:HOLD

These commands control the autoranging routine in the Test Set. :AUTO enables the routines, :HOLD disables them.

Syntax

```
CONF:OPER:AUTO !enables and autoranging
CONF:OPER:HOLD !disables and autoranging
```

Screen/field equivalent

CONF:OPER:AUTO and :OPER:HOLD control the **Range Hold** field of the INSTRUMENT CONFIGURE screen.

:PCMCia:CARD:STATus?

This command queries whether or not a PC card is inserted in the Test Set's front-panel card slot (No Card, or Inserted).

Syntax

```
CONF:PCMC:CARD:STAT?
```

Screen/Field Equivalent

CONF:PCMC:CARD:STAT? queries the **Card Status** field on the I/O CONFIGURE screen.

:PCMCia:CARD:TYPE?

This command queries the type of PC card inserted in the Test Set's front-panel card slot (such as, RAM or ROM).

Syntax

```
CONF:PCMC:CARD:TYPE?
```

Screen/Field Equivalent

CONF:PCMC:CARD:TYPE? queries the **Card Status** field on the I/O CONFIGURE screen.

:PCMCia:CARD:SIZE?

This command queries the size of the PC card inserted in the Test Set's front-panel card slot (such as, 1M Bytes).

Syntax

```
CONF:PCMC:CARD:SIZE?
```

Screen/Field Equivalent

CONF:PCMC:CARD:SIZE? queries the **Card Status** field on the I/O CONFIGURE screen.

:PRINt:ADDRess <integer>
:PRINt:ADDRess?

These commands set/query the printer address used when CONF:PRIN:DEST is 'GPIB'.

This command utilizes the "Integer Number Setting Syntax" on page 162.

Syntax

```
CONF:PRIN:ADDR <integer> !values 0 to 30

CONF:PRIN:ADDR?
```

Screen/field equivalent

CONF:PRIN:ADDR controls the **Printer Adrs** field of the PRINTER CONFIGURE screen. This field is displayed only when the **Printer Port** field is set to **GPIB**.

:PRINt:LINes|LINE <integer>
:PRINt:LINes|LINE?

:PRIN:LIN sets/queries the number of lines to be printed per page. This command utilizes the "Integer Number Setting Syntax" on page 162.

Syntax

```
CONF:PRIN:LIN <integer> !values: 5 to 120

CONF:PRIN:LIN?
```

Screen/field equivalent

CONF:PRIN:LIN controls the **Lines/Page** field of the PRINTER CONFIGURE screen.

:PRINt:DESTination|PORTs <string>
:PRINt:DESTination?|PORTs?

These commands set/query the port setting for the printer. The :PRIN:DEST command is equivalent to the :PRIN:PORT command.

Syntax

```
CONF:PRIN:DEST 'Serial 9'
               'Parallel 15'
               'HP-IB'

CONF:PRIN:DEST?
```

Screen/field equivalent

CONF:PRIN:DEST controls the **Printer Port** field of the PRINTER CONFIGURE screen.

:PRINt:FFSTart <string>
:PRINt:FFSTart?

These commands set/query a form feed (blank page) at the start of printing.

Syntax

```
CONF:PRIN:FFST 'Yes'
               'No'

CONF:PRIN:FFST?
```

Screen/field equivalent

CONF:PRIN:FFST controls the **FF at Start** field of the PRINTER CONFIGURE screen.

:PRINt:FFENd <string>
:PRINt:FFENd?

These commands set/query a form feed (blank page) at the end of printing.

Syntax

```
CONF:PRIN:FFEN 'Yes'
    'No'
CONF:PRIN:FFEN?
```

Screen/field equivalent

CONF:PRIN:FFEN controls the **FF at End** field of the PRINTER CONFIGURE screen.

:PRINt:TITLe <string>
:PRINt:TITLe?

These commands set/query the title of the print output.

Available character set:

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

_0123456789 !@#$%^&*()-+=<>?[]{}\|';:",./

Syntax

```
CONF:PRIN:TITL '<string>' !up to 50 characters
CONF:PRIN:TITL
```

Screen/field equivalent

CONF:PRIN:TITL controls the **Print Title** field of the PRINTER CONFIGURE screen.

:PRINt:PRINter|HPModel|HPMO <string>
:PRINt:PRINter|HPModel|HPMO?

These commands set/query the type of printer chosen for printing.

Syntax

```
CONF:PRIN:PRIN 'ThinkJet'
               'QuietJet'
               'PaintJet'
               'DeskJet'
               'LaserJet'
               'Epson FX-80'
               'Epson LX-850'
CONF:PRIN:PRIN?
```

Screen/field equivalent

CONF:PRIN:PRIN controls the **Model** field of the PRINTER CONFIGURE screen.

:REFerence:INPut:SELect <string>
:REFerence:INPut:SELect

These commands set/query the reference input selection. 'Internal' and 'External' define an internal or external reference. 'Auto' will switch between external and internal inputs, based on the signal's presence. However, you must still set the frequency of the external reference input (CONF:REF:INP:EXT) even though this is set to 'Auto'. It does not automatically select the frequency.

Syntax

```
CONF:REF:INP:SEL 'Auto'
                 'Internal'
                 'External'
CONF:REF:INP:SEL?
```

Screen/field equivalent

CONF:REF:INP:SEL controls the **Ref Select** field of the INSTRUMENT CONFIGURE screen.

:REFerence:TDMA <string>
:REFerence:TDMA?

These commands set/query the frequency of the TDMA reference.

Syntax

```
:REF:TDMA '25 Hz Ext'
          '50 Hz Ext'
          '24.3kHz Ext'
          '48.6kHz Ext'
          '10 MHz Ext'
          '10 MHz Int'
:REF:TDMA?
```

Screen/field equivalent

CONF:REF:TDMA controls the **TDMA Ref** field of the INSTRUMENT CONFIGURE screen.

:REFerence:SYNthesizer <string>
:REFerence:SYNthesizer?

These commands set/query the frequency of the synthesizer reference.

Syntax

```
:REF:SYN '1 MHz Ext'
         '2 MHz Ext'
         '3 MHz Ext'
         '4.8 MHz Ext'
         '5 MHz Ext'
         '10 MHz Ext'
         '15 MHz Ext'
         'Int OCXO'
         'TDMA Ref'
:REF:SYN?
```

Screen/field equivalent

CONF:REF:SYN controls the **Synth Ref** field of the INSTRUMENT CONFIGURE screen.

:REFerence:PCM <string>
:REFerence:PCM?

These commands set/query the state of the PCM reference.

Syntax

```
:REF:PCM 'On'
         'Off'
:REF:PCM?
```

Screen/field equivalent

CONF:REF:PCM controls the **PCM Ref** field of the INSTRUMENT CONFIGURE screen.

:RFCStandard <string>
:RFCStandard?

These commands set/query the RF channel standard. This command is used in conjunction with the CONF:RFD 'Chan' command.

Syntax

```
CONF:RFCS 'MS US PCS'
    'LS US PCS'
           'MS AMPS'
           'LS AMPS'
           'MSL NAMPS'
           'MSM NAMPS'
           'MSU NAMPS'
           'LSL NAMPS'
           'LSM NAMPS'
           'LSU NAMPS'
           'MS TACS'
           'LS TACS'
           'MS ETACS'
           'LS ETACS'
           'MS NTACS'
           'LS NTACS'
           'MS JTACS'
           'LS JTACS'
           'USER-DEF'
CONF:RFCS?
```

Screen/field equivalent

CONF:RFCS controls the **RF Chan Std** field of the INSTRUMENT CONFIGURE screen. This field is displayed only when the **RF Display** field is set to **Chan**.

:RFDisplay <string>
:RFDisplay?

These commands set/query the RF display mode. See the *Reference Guide* for more information about frequency and channel tuning.

Syntax

```
CONF:RFD 'Freq' !sets RF display to frequency tuning mode
         'Chan' !sets RF display to channel tuning mode
CONF:RFD?
```

Screen/field equivalent

CONF:RFD controls the **RF Display** field of the INSTRUMENT CONFIGURE screen.

:RFIMped <string>
:RFIMPed?

These commands set/query the way that RF generator's voltages are expressed (across a 50 ohm load or open circuit). The RF generator's amplitude units must be V, mV, uV, or dbuV for this command to have an effect.

Syntax

```
CONF:RFIM '50 ohm'
          'emf'
CONF:RFIM?
```

Screen/field equivalent

CONF:RFIM controls the **RFGen Volts** field of the INSTRUMENT CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:BAUD <string>
:SPOR9|SPORT9|SB9|SP9:BAUD?

These commands set/query the baud rate of the SERIAL 9 port.

Syntax

```
CONF:SPOR9:BAUD ‘150’
                ‘300’
                ‘600‘
                ‘1200‘
                ‘2400‘
                ‘4800‘
                ‘9600‘
               ‘19200‘

CONF:SPOR9:BAUD?
```

Screen/field equivalent

CONF:SPOR9:BAUD controls the **`Serial Baud`** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:PARity <string>
:SPOR9|SPORT9|SB9|SP9:PARity?

These commands set/query the parity of the SERIAL 9 port.

Syntax

```
CONF:SPOR9:PAR ‘None’

           'Odd'
                'Even'
                'Always 1'
              'Always 0'

CONF:SPOR9:PAR?
```

Screen/field equivalent

CONF:SPOR9:PAR controls the **`Parity`** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:DATA <string>
:SPOR9|SPORT9|SB9|SP9:DATA?

These commands set/query the number of data bits per data word sent over the SERIAL 9 port.

Syntax

```
CONF:SPOR9:DATA '7 bits'
                '8 bits'
CONF:SPOR9:DATA?
```

Screen/field equivalent

CONF:SPOR9:DATA controls the **Data Length** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:STOP <string>
:SPOR9|SPORT9|SB9|SP9:STOP?

These commands set/query the number of stop bits used for serial communication over the SERIAL 9 port.

Syntax

```
CONF:SPOR9:STOP '1 bit'
                '2 bits'
CONF:SPOR9:STOP?
```

Screen/field equivalent

CONF:SPOR9:STOP controls the **Stop Length** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:FCONtrol|FLOW <string>
:SPOR9|SPORT9|SB9|SP9:FCONtrol|FLOW?

These commands set/query the flow control to set the pace of serial communications for the SERIAL 9 port.

Syntax

```
CONF:SPOR9:FCON 'Xon/Xoff'
                'None'
CONF:SPOR9:FCON?
```

Screen/field equivalent

CONF:SPOR9:FCON controls the **Flow Control** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:IBECho <string>
:SPOR9|SPORT9|SB9|SP9:IBECho?

These commands set/query the screen and error message echoing from IBASIC.

Syntax

```
CONF:SPOR9:IBEC 'On'
                'Off'
CONF:SPOR9:IBEC
```

Screen/field equivalent

CONF:SPOR9:IBEC controls the **IBASIC Echo** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:IECHo <string>
:SPOR9|SPORT9|SB9|SP9:IECHo?

These commands set/query the character and screen echoing (instrument echo) when using an external ASCII RS-232 terminal or computer to enter or edit the IBASIC program.

Syntax

```
CONF:SPOR9:IECH 'On'
                'Off'
CONF:SPOR9:IECH
```

Screen/field equivalent

CONF:SPOR9:IECH controls the **Inst Echo** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:MODem:MODE <string>
:SPOR9|SPORT9|SB9|SP9:MODem:MODE?

These commands set/query the modem mode.

Syntax

```
CONF:SPOR9:MOD:MODE 'Disable'
    'Ignore'
                    'Answer'
                    'Dial Back'

CONF:SPOR9:MOD:MODE? <returns quoted string>
```

Screen/field equivalent

CONF:SPOR9:MOD:MODE controls the **Modem Mode** field of the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CALL:ORIGinate

This command causes the modem to place a call using the dialing string entered with the CONF:SPOR9:MOD:CONN:NUMB command.

Syntax

```
CONF:SPOR9:MOD:CALL:ORIG
```

Screen/field equivalent

CONF:SPOR9:MOD:CALL:ORIG controls the **Orignate** subfield of the **Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CALL:DISConnect

This command causes the modem to disconnect from the call in progress. It also cancels any pending call origination retry (CONF:SPOR9:MOD:CONN:RETRy). This field is inactive when CONF:SPOR9:MOD:MODE 'Disable' command is used.

Syntax

```
CONF:SPOR9:MOD:CALL:DISC
```

Screen/field equivalent

CONF:SPOR9:MOD:CALL:DISC controls the **Disconnect** subfield of the **Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CALL:STATus?

This command queries the status of the modem.

Syntax

```
CONF:SPOR9:MOD:CALL:STAT?
```

Screen/field equivalent

CONF:SPOR9:MOD:CALL:STAT? queries the **Status** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:NUMBer
:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:NUMBer?

This command queries the status of the modem.

Syntax

```
CONF:SPOR9:MOD:CONN:NUMB <string up to 40 characters>
CONF:SPOR9:MOD:CONN:NUMB?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONN:NUMB controls the **Number to Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:TIMeout
:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:TIMeout?

This command sets/queries the number of seconds to wait before aborting a connection attempt. This applies to both answer and originate activities.

Syntax

```
CONF:SPOR9:MOD:CONN:TIM <integer>
CONF:SPOR9:MOD:CONN:TIM?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONN:TIM controls the **Connection Timeout** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:HDELay
:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:HDELay?

This command sets/queries the number of seconds to wait before attempting an origination. This applies to the delay prior to attempting a dialback as well as the delay prior to retrying an origination as part of the retry sequence.

Syntax

```
CONF:SPOR9:MOD:CONN:HDEL <integer>
CONF:SPOR9:MOD:CONN:HDEL?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONN:HDEL controls the **Holdoff Delay** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:RETRy
:SPOR9|SPORT9|SB9|SP9:MODem:CONNect:RETRy?

This command sets/queries the number of calls that will be tried before an origination attempt is terminated. The total number of tries will be the number entered in this field, plus one for the original attempt.

Syntax

```
CONF:SPOR9:MOD:CONN:RETR <integer>
CONF:SPOR9:MOD:CONN:RETR?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONN:RETR controls the **Retrys** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:UPDate

This command is used to send the modem configuration strings entered in the CONF:SPOR9:MOD:CONF:STR1, STR2, and STR3 commands.

Syntax

```
CONF:SPOR9:MOD:CONF:UPD
```

Screen/field equivalent

CONF:SPOR9:MOD:CONF:UPD controls the **Modem Configuration** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:STRing1
:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:STRing1?
:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:STRing2
:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:STRing2?
:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:STRing3
:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:STRing3?

These commands are used to enter the modem configuration strings to be sent when the CONF:SPOR9:MOD:CONF:UPD command is executed. Each string has a maximum of 40 characters.

STR 1 is the initial configuration string sent to the modem when the CONF:SPOR9:MOD:CONF:UPD command is executed. The second line is the second string sent, and the third line is the third string sent. The second and third lines can be left blank.

Syntax

```
CONF:SPOR9:MOD:CONF:STR1 <string>
CONF:SPOR9:MOD:CONF:STR1?
CONF:SPOR9:MOD:CONF:STR2 <string>
CONF:SPOR9:MOD:CONF:STR2?
CONF:SPOR9:MOD:CONF:STR3 <string>
CONF:SPOR9:MOD:CONF:STR3?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONF:STR1 controls the first line of the **Modem Initialization/Configuration** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:ECHaracter
:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:ECHaracter?

This command sets/queries a one-character, non-printable escape character that you use to define your own escape command sequence.

Syntax

```
CONF:SPOR9:MOD:CONF:ECH <character>
CONF:SPOR9:MOD:CONF:ECH?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONF:ECH controls the **Command Escape Character** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:CONFigure:ECEQivalent?

This command reports the decimal equivalent of the escape character entered with the CONF:SPOR9:MOD:CONF:ECH.

Syntax

```
CONF:SPOR9:MOD:CONF:ECEQ?
```

Screen/field equivalent

CONF:SPOR9:MOD:CONF:ECEQ? queries the **Decimal Equivalent** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:SECurity:STATe
:SPOR9|SPORT9|SB9|SP9:MODem:SECurity:STATe?

This command controls the usage of a password security challenge.

- 'Off' - no password challenge on connection
- 'On' - issues a password challenge on connection. The caller must enter a password. The password must match the string entered in the CONF:SPOR9:MOD:SEC:PASS command.

Syntax

```
CONF:SPOR9:MOD:SEC:STAT 'On'
                        'Off'

CONF:SPOR9:MOD:CONF:STAT?
```

Screen/field equivalent

CONF:SPOR9:MOD:SEC:STAT controls the **Incoming Call Security** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:MODem:SECurity:PASSword
:SPOR9|SPORT9|SB9|SP9:MODem:SECurity:PASSword?

This command sets/queries the password required by a security challenge when the CONF:SPOR9:MOD:SEC:STAT 'On' command is used.

Syntax

```
CONF:SPOR9:MOD:SEC:PASS <string>

CONF:SPOR9:MOD:SEC:PASS?
```

Screen/field equivalent

CONF:SPOR9:MOD:SEC:PASS controls the **Pssword** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 9**.

:SPOR9|SPORT9|SB9|SP9:SIN|SINP <string>
:SPOR9|SPORT9|SB9|SP9:SIN|SINP?

These commands set/query the destination of data characters received by the Test Set via the SERIAL 9 port.

Syntax

```
CONF:SPOR9:SIN 'Inst'
               'IBASIC'

CONF:SPOR9:SIN?
```

Screen/field equivalent

CONF:SPOR9:SIN controls the **Serial_9 In** field of the I/O CONFIGURE screen.

:SPOR9|SPORT9|SB9|SP9:STATus:LINE?

This command queries the line status register.

Syntax

```
CONF:SPOR9:STAT:LINE?
```

Screen/field equivalent

No screen/field equivalent.

:SPOR9|SPORT9|SB9|SP9:STATus:MODem?

This command queries the modem status register.

Syntax

```
CONF:SPOR9:STAT:MOD?
```

Screen/field equivalent

No screen/field equivalent.

:SPOR10|SPORT10|SB10|SP10:BAUD <string>
:SPOR10|SPORT10|SB10|SP10:BAUD?

These commands set/query the baud rate of the SERIAL 10 port.

Syntax

```
CONF:SPOR10:BAUD ‘150’
                 ‘300’
                 ‘600‘
                 ‘1200‘
                 ‘2400‘
                 ‘4800‘
                 ‘9600‘
                   ‘19200‘

CONF:SPOR10:BAUD?
```

Screen/field equivalent

CONF:SPOR10:BAUD controls the **`Serial Baud`** field of the I/O CONFIGURE screen.

:SPOR10|SPORT10|SB10|SP10:PARity <string>
:SPOR10|SPORT10|SB10|SP10:PARity?

These commands set/query the parity of the SERIAL 10 port.

Syntax

```
CONF:SPOR10:PAR ‘None’

           'Odd'
                  'Even'
                  'Always 1'
                  'Always 0'

CONF:SPOR10:PAR?
```

Screen/field equivalent

CONF:SPOR10:PAR controls the **`Parity`** field of the I/O CONFIGURE screen.

:SPOR10|SPORT10|SB10|SP10:DATA <string>
:SPOR10|SPORT10|SB10|SP10:DATA?

These commands set/query the number of data bits per data word sent over the SERIAL 10 port.

Syntax

```
CONF:SPOR10:DATA '7 bits'
                 '8 bits'
CONF:SPOR10:DATA?
```

Screen/field equivalent

CONF:SPOR10:DATA controls the **Data Length** field of the I/O CONFIGURE screen.

:SPOR10|SPORT10|SB10|SP10:STOP <string>
:SPOR10|SPORT10|SB10|SP10:STOP?

These commands set/query the number of stop bits used for serial communication over the SERIAL 10 port.

Syntax

```
CONF:SPOR10:STOP '1 bit'
                 '2 bits'
CONF:SPOR10:STOP?
```

Screen/field equivalent

CONF:SPOR10:STOP controls the **Stop Length** field of the I/O CONFIGURE screen.

:SPOR10|SPORT10|SB10|SP10:FCONtrol|FLOW <string>
:SPOR10|SPORT10|SB10|SP10:FCONtrol|FLOW?

These commands set/query the flow control to set the pace of serial communications for the SERIAL 10 port.

Syntax

```
CONF:SPOR10:FCON 'Xon/Xoff'
                 'None'
CONF:SPOR10:FCON?
```

Screen/field equivalent

CONF:SPOR10:FCON controls the **Flow Control** field of the I/O CONFIGURE screen.

:SPOR10|SPORT10|SB10|SP10:STATus:LINE?

This command queries the line status register.

Syntax

```
CONF:SPOR10:STAT:LINE?
```

Screen/field equivalent

No screen/field equivalent.

:SPOR10|SPORT10|SB10|SP10:STATus:MODem?

This command queries the modem status register.

Syntax

```
CONF:SPOR10:STAT:MOD?
```

Screen/field equivalent

No screen/field equivalent.

:SPOR10|SPORT10|SB10|SP10:MODem:MODE <string>
:SPOR10|SPORT10|SB10|SP10:MODem:MODE?

These commands set/query the modem mode.

Syntax

```
CONF:SPOR10:MOD:MODE 'Disable'
    'Ignore'
                     'Answer'
                     'Dial Back'

CONF:SPOR10:MOD:MODE? <returns quoted string>
```

Screen/field equivalent

CONF:SPOR10:MOD:MODE controls the **`Modem Mode`** field of the MODEM CONFIGURE screen when the **`Serial Port`** field is set to **`Port 10`**.

:SPOR10|SPORT10|SB10|SP10:MODem:CALL:ORIGinate

This command causes the modem to place a call using the dialing string entered with the CONF:SPOR10:MOD:CONN:NUMB command.

Syntax

```
CONF:SPOR10:MOD:CALL:ORIG
```

Screen/field equivalent

CONF:SPOR10:MOD:CALL:ORIG controls the **Orignate** subfield of the **Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CALL:DISConnect

This command causes the modem to disconnect from the call in progress. It also cancels any pending call origination retrys (CONF:SPOR10:MOD:CONN:RETRy). This field is inactive when CONF:SPOR10:MOD:MODE 'Disable' command is used.

Syntax

```
CONF:SPOR10:MOD:CALL:DISC
```

Screen/field equivalent

CONF:SPOR10:MOD:CALL:DISC controls the **Disconnect** subfield of the **Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CALL:STATus?

This command queries the status of the modem.

Syntax

```
CONF:SPOR10:MOD:CALL:STAT?
```

Screen/field equivalent

CONF:SPOR10:MOD:CALL:STAT? queries the **Status** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:NUMBer
:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:NUMBer?

This command queries the status of the modem.

Syntax

```
CONF:SPOR10:MOD:CONN:NUMB <string up to 40 characters>
CONF:SPOR10:MOD:CONN:NUMB?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONN:NUMB controls the **Number to Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:TIMeout
:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:TIMeout?

This command sets/queries the number of seconds to wait before aborting a connection attempt. This applies to both answer and originate activities.

Syntax

```
CONF:SPOR10:MOD:CONN:TIM <integer>
CONF:SPOR10:MOD:CONN:TIM?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONN:TIM controls the **Connection Timeout** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:HDELay
:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:HDELay?

This command sets/queries the number of seconds to wait before attempting an origination. This applies to the delay prior to attempting a dialback as well as the delay prior to retrying an origination as part of the retry sequence.

Syntax

```
CONF:SPOR10:MOD:CONN:HDEL <integer>
CONF:SPOR10:MOD:CONN:HDEL?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONN:HDEL controls the **Holdoff Delay** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:RETRy
:SPOR10|SPORT10|SB10|SP10:MODem:CONNect:RETRy?

This command sets/queries the number of calls that will be tried before an origination attempt is terminated. The total number of tries will be the number entered in this field, plus one for the original attempt.

Syntax

```
CONF:SPOR10:MOD:CONN:RETR <integer>
CONF:SPOR10:MOD:CONN:RETR?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONN:RETR controls the **Retrys** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:UPDate

This command is used to send the modem configuration strings entered in the CONF:SPOR10:MOD:CONF:STR1, STR2, and STR3 commands.

Syntax

```
CONF:SPOR10:MOD:CONF:UPD
```

Screen/field equivalent

CONF:SPOR10:MOD:CONF:UPD controls the **Modem Configuration** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:STRing1
:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:STRing1?
:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:STRing2
:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:STRing2?
:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:STRing3
:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:STRing3?

These commands are used to enter the modem configuration strings to be sent when the CONF:SPOR10:MOD:CONF:UPD command is executed. Each string has a maximum of 40 characters.

STR 1 is the initial configuration string sent to the modem when the CONF:SPOR10:MOD:CONF:UPD command is executed. The second line is the second string sent, and the third line is the third string sent. The second and third lines can be left blank

Syntax

```
CONF:SPOR10:MOD:CONF:STR1 <string>
CONF:SPOR10:MOD:CONF:STR1?
CONF:SPOR10:MOD:CONF:STR2 <string>
CONF:SPOR10:MOD:CONF:STR2?
CONF:SPOR10:MOD:CONF:STR3 <string>
CONF:SPOR10:MOD:CONF:STR3?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONF:STR1 controls the first line of the **Modem Initialization/Configuration** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:ECHaracter
:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:ECHaracter?

This command sets/queries a one-character, non-printable escape character that you use to define your own escape command sequence.

Syntax

```
CONF:SPOR10:MOD:CONF:ECH <character>
CONF:SPOR10:MOD:CONF:ECH?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONF:ECH controls the **Command Escape Character** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:CONFigure:ECEQivalent?

This command reports the decimal equivalent of the escape character entered with the CONF:SPOR10:MOD:CONF:ECH.

Syntax

```
CONF:SPOR10:MOD:CONF:ECEQ?
```

Screen/field equivalent

CONF:SPOR10:MOD:CONF:ECEQ? queries the **Decimal Equivalent** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:SECurity:STATe
:SPOR10|SPORT10|SB10|SP10:MODem:SECurity:STATe?

This command controls the usage of a password security challenge.

- 'Off' - no password challenge on connection
- 'On' - issues a password challenge on connection. The caller must enter a password. The password must match the string entered in the CONF:SPOR10:MOD:SEC:PASS command.

Syntax

```
CONF:SPOR10:MOD:SEC:STAT 'On'
                         'Off'

CONF:SPOR10:MOD:CONF:STAT?
```

Screen/field equivalent

CONF:SPOR10:MOD:SEC:STAT controls the **Incoming Call Security** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR10|SPORT10|SB10|SP10:MODem:SECurity:PASSword
:SPOR10|SPORT10|SB10|SP10:MODem:SECurity:PASSword?

This command sets/queries the password required by a security challenge when the CONF:SPOR10:MOD:SEC:STAT 'On' command is used.

Syntax

```
CONF:SPOR10:MOD:SEC:PASS <string>

CONF:SPOR10:MOD:SEC:PASS?
```

Screen/field equivalent

CONF:SPOR10:MOD:SEC:PASS controls the **Pssword** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 10**.

:SPOR11|SPORT11|SB11|SP11:BAUD <string>
:SPOR11|SPORT11|SB11|SP11:BAUD?

These commands set/query the baud rate of the SERIAL 11 port.

Syntax

```
CONF:SPOR11:BAUD '150'
                 '300'
                 '600'
                 '1200'
                 '2400'
                 '4800'
                 '9600'
                 '19200'

CONF:SPOR11:BAUD?
```

Screen/field equivalent

CONF:SPOR11:BAUD controls the **Serial Baud** field of the I/O CONFIGURE screen.

:SPOR11|SPORT11|SB11|SP11:PARity <string>
:SPOR11|SPORT11|SB11|SP11:PARity?

These commands set/query the parity of the SERIAL 11 port.

Syntax

```
CONF:SPOR11:PAR 'None'
            'Odd'
                 'Even'
                 'Always 1'
                 'Always 0'
CONF:SPOR11:PAR?
```

Screen/field equivalent

CONF:SPOR11:PAR controls the **Parity** field of the I/O CONFIGURE screen.

:SPOR11|SPORT11|SB11|SP11:DATA <string>
:SPOR11|SPORT11|SB11|SP11:DATA?

These commands set/query the number of data bits per data word sent over the SERIAL 11 port.

Syntax

```
CONF:SPOR11:DATA '7 bits'
            '8 bits'
CONF:SPOR11:DATA?
```

Screen/field equivalent

CONF:SPOR11:DATA controls the **Data Length** field of the I/O CONFIGURE screen.

:SPOR11|SPORT11|SB11|SP11:STOP <string>
:SPOR11|SPORT11|SB11|SP11:STOP?

These commands set/query the number of stop bits used for serial communication over the SERIAL 11 port.

Syntax

```
CONF:SPOR11:STOP '1 bit'
                 '2 bits'
CONF:SPOR11:STOP?
```

Screen/field equivalent

CONF:SPOR11:STOP controls the **Stop Length** field of the I/O CONFIGURE screen.

:SPOR11|SPORT11|SB11|SP11:FCONtrol|FLOW <string>
:SPOR11|SPORT11|SB11|SP11:FCONtrol|FLOW?

These commands set/query the flow control to set the pace of serial communications for the SERIAL 11 port.

Syntax

```
CONF:SPOR11:FCON 'Xon/Xoff'
        'None'
CONF:SPOR11:FCON?
```

Screen/field equivalent

CONF:SPOR11:FCON controls the **Flow Control** field of the I/O CONFIGURE screen.

:SPOR11|SPORT11|SB11|SP11:STATus:LINE?

This command queries the line status register.

Syntax

```
CONF:SPOR11:STAT:LINE?
```

Screen/field equivalent

No screen/field equivalent.

:SPOR11|SPORT11|SB11|SP11:STATus:MODem?

This command queries the modem status register.

Syntax

```
CONF:SPOR11:STAT:MOD?
```

Screen/field equivalent

No screen/field equivalent.

:SPOR11|SPORT11|SB11|SP11:MODem:MODE <string>
:SPOR11|SPORT11|SB11|SP11:MODem:MODE?

These commands set/query the modem mode.

Syntax

```
CONF:SPOR11:MOD:MODE 'Disable'
    'Ignore'
                    'Answer'
                    'Dial Back'

CONF:SPOR11:MOD:MODE? <returns quoted string>
```

Screen/field equivalent

CONF:SPOR11:MOD:MODE controls the **Modem Mode** field of the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CALL:ORIGinate

This command causes the modem to place a call using the dialing string entered with the CONF:SPOR11:MOD:CONN:NUMB command.

Syntax

```
CONF:SPOR11:MOD:CALL:ORIG
```

Screen/field equivalent

CONF:SPOR11:MOD:CALL:ORIG controls the **Orignate** subfield of the **Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CALL:DISConnect

This command causes the modem to disconnect from the call in progress. It also cancels any pending call origination retrys (CONF:SPOR11:MOD:CONN:RETRy). This field is inactive when CONF:SPOR11:MOD:MODE 'Disable' command is used.

Syntax

```
CONF:SPOR11:MOD:CALL:DISC
```

Screen/field equivalent

CONF:SPOR11:MOD:CALL:DISC controls the **Disconnect** subfield of the **Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CALL:STATus?

This command queries the status of the modem.

Syntax

```
CONF:SPOR11:MOD:CALL:STAT?
```

Screen/field equivalent

CONF:SPOR11:MOD:CALL:STAT? queries the **Status** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:NUMBer
:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:NUMBer?

This command queries the status of the modem.

Syntax

```
CONF:SPOR11:MOD:CONN:NUMB <string up to 40 characters>
CONF:SPOR11:MOD:CONN:NUMB?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONN:NUMB controls the **Number to Call** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:TIMeout
:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:TIMeout?

This command sets/queries the number of seconds to wait before aborting a connection attempt. This applies to both answer and originate activities.

Syntax

```
CONF:SPOR11:MOD:CONN:TIM <integer>
CONF:SPOR11:MOD:CONN:TIM?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONN:TIM controls the **Connection Timeout** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:HDELay
:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:HDELay?

This command sets/queries the number of seconds to wait before attempting an origination. This applies to the delay prior to attempting a dialback as well as the delay prior to retrying an origination as part of the retry sequence.

Syntax

```
CONF:SPOR11:MOD:CONN:HDEL <integer>
CONF:SPOR11:MOD:CONN:HDEL?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONN:HDEL controls the **Holdoff Delay** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:RETRy
:SPOR11|SPORT11|SB11|SP11:MODem:CONNect:RETRy?

This command sets/queries the number of calls that will be tried before an origination attempt is terminated. The total number of tries will be the number entered in this field, plus one for the original attempt.

Syntax

```
CONF:SPOR11:MOD:CONN:RETR <integer>
CONF:SPOR11:MOD:CONN:RETR?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONN:RETR controls the **Retrys** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:UPDate

This command is used to send the modem configuration strings entered in the CONF:SPOR11:MOD:CONF:STR1, STR2, and STR3 commands.

Syntax

```
CONF:SPOR11:MOD:CONF:UPD
```

Screen/field equivalent

CONF:SPOR11:MOD:CONF:UPD controls the **Modem Configuration** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:STRing1
:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:STRing1?
:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:STRing2
:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:STRing2?
:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:STRing3
:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:STRing3?

These commands are used to enter the modem configuration strings to be sent when the CONF:SPOR11:MOD:CONF:UPD command is executed. Each string has a maximum of 40 characters.

STR 1 is the initial configuration string sent to the modem when the CONF:SPOR11:MOD:CONF:UPD command is executed. The second line is the second string sent, and the third line is the third string sent. The second and third lines can be left blank.

Syntax

```
CONF:SPOR11:MOD:CONF:STR1 <string>
CONF:SPOR11:MOD:CONF:STR1?
CONF:SPOR11:MOD:CONF:STR2 <string>
CONF:SPOR11:MOD:CONF:STR2?
CONF:SPOR11:MOD:CONF:STR3 <string>
CONF:SPOR11:MOD:CONF:STR3?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONF:STR1 controls the first line of the **Modem Initialization/Configuration** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:ECHaracter
:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:ECHaracter?

This command sets/queries a one-character, non-printable escape character that you use to define your own escape command sequence.

Syntax

```
CONF:SPOR11:MOD:CONF:ECH <character>
CONF:SPOR11:MOD:CONF:ECH?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONF:ECH controls the **Command Escape Character** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:CONFigure:ECEQivalent?

This command reports the decimal equivalent of the escape character entered with the CONF:SPOR11:MOD:CONF:ECH.

Syntax

```
CONF:SPOR11:MOD:CONF:ECEQ?
```

Screen/field equivalent

CONF:SPOR11:MOD:CONF:ECEQ? queries the **Decimal Equivalent** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:SECurity:STATe
:SPOR11|SPORT11|SB11|SP11:MODem:SECurity:STATe?

This command controls the usage of a password security challenge.

- 'Off' - no password challenge on connection
- 'On' - issues a password challenge on connection. The caller must enter a password. The password must match the string entered in the CONF:SPOR11:MOD:SEC:PASS command.

Syntax

```
CONF:SPOR11:MOD:SEC:STAT 'On'
                         'Off'

CONF:SPOR11:MOD:CONF:STAT?
```

Screen/field equivalent

CONF:SPOR11:MOD:SEC:STAT controls the **Incoming Call Security** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPOR11|SPORT11|SB11|SP11:MODem:SECurity:PASSword
:SPOR11|SPORT11|SB11|SP11:MODem:SECurity:PASSword?

This command sets/queries the password required by a security challenge when the CONF:SPOR11:MOD:SEC:STAT 'On' command is used.

Syntax

```
CONF:SPOR11:MOD:SEC:PASS <string>

CONF:SPOR11:MOD:SEC:PASS?
```

Screen/field equivalent

CONF:SPOR11:MOD:SEC:PASS controls the **Pssword** field on the MODEM CONFIGURE screen when the **Serial Port** field is set to **Port 11**.

:SPSelect <string>
:SPSelect?

These commands set/query the selected serial port for configuration purposes. It defines which port's configuration settings are displayed on the I/O CONFIGURE screen.

Syntax

```
CONF:SPS 'Serial 9'
         'Serial 10'
         'Serial 11'

CONF:SPS?
```

Screen/field equivalent

CONF:SPS controls the **Serial Port** field of the I/O CONFIGURE screen.

:SRLocation <string>
:SRLocation?

These commands set/query the save and recall locations.

Syntax

```
CONF:SRL 'INTERNAL'
         'CARD'
         'RAM'
CONF:SRL?
```

Screen/field equivalent

CONF:SRL controls the **Save/Recall** field of the I/O CONFIGURE screen.

:TIME <real number>
:TIME?

These commands set/query the Test Set's time-of-day clock (hh.mm). The clock uses the 24-hour format. For example 1:30 pm is 13.30.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STAT, :DUN, :INCR, or :UNITs command.

Syntax

```
CONF:TIME <real number> !hh.mm where hh is hours, mm is
minutes
CONF:TIME?
```

Screen/field equivalent

CONF:TIME controls the **Time** field of the INSTRUMENT CONFIGURE screen.

DECoder subsystem

:ARM:MODE <string>
:ARM:MODE?

These commands set/query the measurement arming mode. This command specifies how long you want the analyzer to decode incoming signals.

- 'Single' tells the analyzer to display the information received during one gate time. Measurements are triggered using the DGAN:TRIG:ARM and retriggered using the same command. To disarm the measurement, use the DEC:STOP command.
- 'Cont' is used to automatically re-arm the analyzer and display the measurements continuously until the DEC:ARM:MODE 'Single' command is sent. Each measurement is overwritten by subsequent measurements.

Syntax

```
DEC:ARM:MODE 'Single'
             'Cont'
DEC:ARM:MODE?
```

Screen/field equivalent

DEC:ARM:MODE controls the **Single/Cont** field on the SIGNALING DECODER screens.

:LEVel:AM <real number>
:LEVel:AM?

These commands set/query the expected data signal level (after de-emphasis, if used). For more information about the effects of de-emphasis, see the “De-emphasis and Input Level” description in the *Reference Guide*.

The higher the level of signal expected by the analyzer, the higher the trigger level is set. The input level should be set high enough to prevent false triggering, but low enough to allow triggering for valid signals. *This may require you to set the input level well below the expected level.*

This command requires one of the following settings for the AF analyzer’s input (AFAN:INP), ‘AM Mod’ or ‘AM Demod’.

This command utilizes the “Real Number Setting Syntax” on page 208 , but does not use the :STATe command.

Syntax

```
DEC:LEV:AM <real number>

DEC:LEV:AM?
```

Screen/field equivalent

DEC:LEV:AM controls the **`Input Level`** field on the SIGNALING DECODER screen when the **`AF Anl In`** field is set to **`AM Mod`** or **`AM Demod`**.

:LEVel:FM <real number>
:LEVel:FM?

These commands set/query the expected data signal level (after de-emphasis, if used). For more information about the effects of de-emphasis, see the “De-emphasis and Input Level” in the *Reference Guide*.

The higher the level of signal expected by the analyzer, the higher the trigger level is set.The input level should be set high enough to prevent false triggering, but low enough to allow triggering for valid signals. *This may require you to set the input level well below the expected level.*

This command requires one of the following settings for the AF analyzer’s input (AFAN:INP), ‘FM Mod’ or ‘FM Demod’.

This command utilizes the “Real Number Setting Syntax” on page 208 , but does not use the :STATe command.

Syntax

```
DEC:LEV:FM <real number>

DEC:LEV:FM?
```

Screen/field equivalent

DEC:LEV:FM controls the **Input Level** field on the SIGNALING DECODER screen when the **AF Anl In** field is set to **FM Mod** or **FM Demod**.

:LEVel:VOLTs <real number>
:LEVel:VOLTs?

These commands set/query the expected data signal level (after de-emphasis, if used). For more information about the effects of de-emphasis, see the “De-emphasis and Input Level” in the *Reference Guide*.

The higher the level of signal expected by the analyzer, the higher the trigger level is set. The input level should be set high enough to prevent false triggering, but low enough to allow triggering for valid signals. *This may require you to set the input level well below the expected level.*

This command requires one of the following settings for the AF analyzer’s input (AFAN:INP), ‘Audio In’, ‘Audio Out’, ‘Ext Mod’ or ‘SSB Demod’.

This command utilizes the “Real Number Setting Syntax” on page 208 , but does not use the :STATe command.

Syntax

```
DEC:LEV:VOLT <real number>

DEC:LEV:VOLT?
```

Screen/field equivalent

DEC:LEV:VOLT controls the **Input Level** field on the SIGNALING DECODER screen when the **AF Anl In** field is set to **Audio In**, **Audio Out**, **Ext Mod**, or **SSB Demod**.

:MODE <string>
:MODE?

These commands set/query the mode of the signaling decoder.

Syntax

```
DEC:MODE 'Func Gen'
          'DTMF'
          'AMPS-TACS'
          'NAMP-NTAC'

DEC:MODE?
```

Screen/field equivalent

DEC:MODE controls the **Mode** field on the SIGNALING DECODER screen.

:POLarity <string>
:POLarity?

These commands match/query the polarity of the encoded signal being analyzed. This function is helpful for restoring the proper data polarity when the transmitter, repeater, or receiver in you communications system has an odd number of inversions. These inversions cause the received data to be inverted when decoded.

- When DEC:POL 'Norm' is used, a logical high (1) is displayed when a positive peak in the received signal is detected. A negative peak displays a logical low (0).
- When DEC:POL 'Invert' is used, a logical low (0) is displayed when a positive peak in the received signal is detected. A negative peak displays a logical high (1).

Inverting amplifiers used in transmitters, receivers, and repeaters can cause an inversion of the modulating digital data. If the decoded signal does not display the expected results, change the polarity to see if the signal is being inverted before it is decoded.

Syntax

```
DEC:POL 'Norm'
        'Invert'
DEC:POL?
```

Screen/field equivalent

DEC:POL controls the **Polarity** field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS** or **NAMP-NTAC**.

:STOP

This command is used to disarm the decoder when you are making single measurements (DEC:ARM:MODE 'Single'). It is not used with continuous measurements.

Syntax

```
DEC:STOP
```

Screen/field equivalent

DEC:STOP controls the **Stop Meas** field on the SIGNALING DECODER screens.

:AMPS|TACS:GATE <real number>
:AMPS|TACS:GATE?

This command specifies how long the decoder analyzes a signal after it has been triggered. Up to 6.55 seconds of gate time can be specified. The minimum gate time must be long enough to allow the preamble and all necessary data bits to be captured.

If the gate time is too long, the decoder's buffer becomes full. A message is displayed instructing you to decrease the gate time.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
DEC:AMPS:GATE <real number>

DEC:AMPS:GATE?
```

Screen/field equivalent

DEC:AMPS:GATE controls the **Gate Time** field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:MESSage <string>
:AMPS|TACS:MESSage?

These commands set/query which of the message streams (entered in the encoder's message fields) will be decoded.

Syntax

```
DEC:AMPS:MESS 'FOCC A&B'
              'FOCC A'
              'FOCC B'
              'RECC'
              'FVC'
              'RVC'

DEC:AMPS:MESS?
```

Screen/field equivalent

DEC:AMPS:MESS has no equivalent screen control field.

:AMPS|TACS:STANdard <string>
:AMPS|TACS:STANdard?

These commands set/query the expected frame structure and channel range of the decoder's incoming signal. Trying to run a test with the wrong standard selected will result in incorrectly decoded data, or will result in a displayed error message.

Syntax

```
DEC:AMPS:STAN 'AMPS'
              'TACS'
              'JTACS'
DEC:AMPS:STAN?
```

Screen/field equivalent

DEC:AMPS:STAN controls the **Standard** field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS**.

:AMPS|TACS:TRIGger:PATTern <string>
:AMPS|TACS:TRIGger:PATTern?

These commands set/query the bit pattern to filter displayed information. The decoder only displays the received data when this binary pattern is encountered immediately after triggering. This is helpful when you only want to display messages containing very specific information.

The trigger pattern is entered as a sequence of ones, zeros, and dots. A dot will cause the decoder to trigger for either a one or a zero in that bit position in the received data stream.

Syntax

```
DEC:AMPS:TRIG:PATT <string>
DEC:AMPS:TRIG:PATT?
```

Screen/field equivalent

DEC:AMPS:TRIG:PATT controls the **Trigger Pattern (bin)** field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS**.

:DTMF:GATE <real number>
:DTMF:GATE?

This command specifies how long the decoder analyzes a signal after it has been triggered. Up to 6.55 seconds of gate time can be specified.

If the gate time is too long, the decoder's buffer becomes full. A message is displayed instructing you to decrease the gate time.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
DEC:DTMF:GATE <real number>

DEC:DTMF:GATE?
```

Screen/field equivalent

DEC:DTMF:GATE controls the **Gate Time** field on the SIGNALING DECODER screen when the **Mode** field is set to **DTMF**.

:FGEN:GATE <real number>

This command specifies how long the decoder analyzes a signal after it has been triggered. Up to 6.55 seconds of gate time can be specified.

If the gate time is too long, the decoder's buffer becomes full. A message is displayed instructing you to decrease the gate time.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
DEC:FGEN:GATE <real number>
```

Screen/field equivalent

DEC:FGEN:GATE controls the **Gate Time** field on the SIGNALING DECODER screen when the **Mode** field is set to **Func Gen**.

:NAMPs|NTACs:CHANnel <string>
:NAMPs|NTACs:CHANnel?

These commands set/query the type of data to decode.

- 'Cntl' selects reverse control channel (RECC) data.
- 'Voice' selects reverse voice channel (RVC) data.

Syntax

```
DEC:NAMP:CHAN 'Cntl'
              'Voice'
DEC:NAMP:CHAN?
```

Screen/field equivalent

DEC:NAMP:CHAN controls the **Channel** field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS** or **NAMP-NTAC**.

:NAMPs|NTACs:GATE <real number>
:NAMPs|NTACs:GATE?

This command specifies how long the decoder analyzes a signal after it has been triggered. Up to 6.55 seconds of gate time can be specified. The minimum gate time must be long enough to allow the preamble and all necessary data bits to be captured.

If the gate time is too long, the decoder's buffer becomes full. A message is displayed instructing you to decrease the gate time.

This function is not used with the NAMPS-NTACS RVC decoder.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
DEC:NAMP:GATE <real number>
```

Screen/field equivalent

DEC:NAMP:GATE controls the **Gate Time** field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC**.

:NAMPs|NTACs:DTMF:GATE <real number>
:NAMPs|NTACs:DTMF:GATE?

These commands set/query how long the decoder analyzes a signal after it has been triggered. Up to 6.55 seconds of gate time can be specified. The minimum gate time must be long enough to allow the preamble and all necessary data bits to be captured.

If the gate time is too long, the decoder's buffer becomes full. A message is displayed instructing you to decrease the gate time.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
DEC:NAMP:DTMF:GATE <real number>

DEC:NAMP:DTMF:GATE?
```

Screen/field equivalent

DEC:NAMP:DTMF:GATE controls the Gate Time field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC**, the **Channel** field is set to **Voice**, and the **Measure** field is set to **DTMF**.

:NAMPs|NTACs:RVC <string>
:NAMPs|NTACs:RVC?

These commands set/query the type of decoded data to display. This command is used in conjunction with the DEC:NAMP:CHAN 'Voice' command.

Syntax

```
DEC:NAMP:RVC 'DSAT'
             'Data'
             'DTMF'

DEC:NAMP:RVC?
```

Screen/field equivalent

DEC:NAMP:RVC controls the **Measure** field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC** and the **Channel** field is set to **Voice**.

:NAMPs|NTACs:STANdard <string>
:NAMPs|NTACs:STANdard?

These commands set/query the expected frame structure and channel range of the decoder's incoming signal. Trying to run a test with the wrong standard selected will result in incorrectly decoded data, or will result in a displayed error message.

Syntax

```
DEC:NAMP:STAN 'NAMP'
              'NTAC'
DEC:NAMP:STAN?
```

Screen/field equivalent

DEC:NAMP:STAN controls the **Standard** field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC**.

:NAMPs|NTACs:TRIGger:PATTern <string>
:NAMPs|NTACs:TRIGger:PATTern?

These commands set/query the bit pattern to filter displayed information. The decoder only displays the received data when this binary pattern is encountered immediately after triggering. This is helpful when you only want to display messages containing very specific information.

The trigger pattern is entered as a sequence of ones, zeros, and dots. A dot will cause the decoder to trigger for either a one or a zero in that bit position in the received data stream.

This function is not available for decoding NAMPS-NTACS RVC information.

Syntax

```
DEC:NAMP:TRIG:PATT <string>
DEC:NAMP:TRIG:PATT?
```

Screen/field equivalent

DEC:NAMP:TRIG:PATT controls the **Trigger Pattern (bin)** field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC**, and the **Channel** field is set to **Cntl**.

DGANalyzer subsystem

:AUTO:POWer:GAIN?

This command queries the power gain of the digital generator when in automatic mode (:POW:GAIN:MODE 'Auto').

Syntax

```
DGAN:AUTO:POW:GAIN?
```

Screen/Field Equivalent

DGAN:AUTO:POW:GAIN? reads the lower subfield of the **Pwr Gain** field on the TDMA TEST screen when the **Measurement** field is set to **Avg Pwr** and the upper **Pwr Gain** subfield is set to **Auto**.

:CORRelate <string>
:CORRelate?

These commands set/query the alignment of the digitally analyzed data with the sync word in the time slot.

- 'Sync' enables the digital analyzer to identify the beginning of the time slot from the total data captured. Sync should be used for all measurements where specific data must be measured, such as bit error measurements. It should be used for all measurements on mobile radios.
- 'None' causes measurements to be made at an arbitrary point within the captured data.

Syntax

```
DGAN:CORR 'Sync'
          'None'
DGAN:CORR?
```

Screen/field equivalent

DGAN:CORR controls the **Correlate** field on the TDMA TEST screen. This field is not used for average power measurements.

:INPut <string>
:INPut?

These commands set/query the input path for the digital analyzer.

- 'Int IF' selects the input path for using the RF IN/OUT port.
- 'EXT IF IN' is not used for this product.
- 'ANL DT IN' is not used for this product.
- 'IQ Mod' selects an internal path that connects the output of the digital generator to the data input on the digital analyzer. The output of the digital generator is also available at the TDMA OUTPUTS port.

Syntax

```
DGAN:INP 'Int IF'
         'Ext IF'
         'ANL DT IN'
         'IQ Mod'
DGAN:INP?
```

Screen/field equivalent

DGAN:INP controls the **Input** field on the TDMA TEST screen.

:GAIN <string>
:GAIN?

These commands set/query the gain of the digital analyzer's input path. This setting affects all digital analyzer measurements except when digital data is being measured using the TDMA ANALYZER INPUTS port for operations such as loopback bit error rate testing.

Syntax

```
DGAN:GAIN '0 dB'
          '6 dB'
          '12 dB'
          '18 dB'
DGAN:GAIN?
```

Screen/field equivalent

DGAN:GAIN controls the **Gain** field on the TDMA TEST screen.

:MEASure <string>
:MEASure?

These commands set/query the measurement mode of the digital analyzer.

Syntax

```
DGAN:MEAS 'EVM 1'
          'EVM 10'
          'BERT'
          'Power'
          'Ad Ch Pwr'
          'Sync Srch'
          'MAHO'
          'Avg Pwr'
          'Chan Pwr'
DGAN:MEAS?
```

Screen/field equivalent

DGAN:MEAS controls the **Measurement** field on the TDMA TEST screen.

:NMSLots <integer>
:NMSLots?

These commands set/query the number of slots from which the digital analyzer will calculate its bit error rate measurement.

Syntax

```
DGAN:NMSL <integer>
```

!See "Integer Number Setting Syntax" on page 162.

Screen/field equivalent

DGAN:NMSL controls the **Num Slots** field in the digital analyzer section (left column) of the TDMA TEST screen.

:POWer:CAL

This command calibrates the channel power measurement.

Syntax

```
DGAN:POW:CAL
```

Screen/Field Equivalent

DGAN:POW:CAL controls the **Ch Pwr Cal** field on the TDMA TEST screen when the **Measurement** field is set to **Chan Pwr**.

:POWer:CHANnelgain:MODE <string>
:POWer:CHANnelgain:MODE?

These commands set/query the channel power gain mode of the digital analyzer.

Syntax

```
DGAN:POW:CHAN:MODE  'Auto'
                    'Hold'
DGAN:POW:CHAN:MODE?
```

Screen/Field Equivalent

DGAN:POW:CHAN:MODE controls the **Auto/Hold** subfield of the **Ch Pwr Gain** field on the TDMA TEST screen when the **Measurement** field is set to **Chan Pwr**.

:POWer:CHANnelgain <string>
:POWer:CHANnelgain?

These commands set/query the channel power gain of the digital analyzer when in hold mode (:POW:CHAN:MODE 'Hold').

Syntax

```
DGAN:POW:CHAN '0 dB'
              '6 dB'
              '12 dB'
              '18 dB'
              '24 dB'
              '30 dB'
              '36 dB'
DGAN:POW:CHAN?
```

Screen/Field Equivalent

DGAN:POW:CHAN controls the lower subfield of the **Ch Pwr Gain** field on the TDMA TEST screen when the **Measurement** field is set to **Chan Pwr** and the upper **Ch Pwr Gain** subfield is set to **Hold**.

:AUTO:CHANnel:GAIN?

This command queries the channel power gain of the digital analyzer when in automatic mode (:POW:CHAN:MODE 'Auto').

Syntax

```
DGAN:AUTO:CHAN:GAIN?
```

Screen/Field Equivalent

DGAN:AUTO:CHAN:GAIN queries the lower subfield of the **Ch Pwr Gain** field on the TDMA TEST screen when the **Measurement** field is set to **Chan Pwr** and the upper **Ch Pwr Gain** subfield is set to **Auto**.

:POWer:GAIN <string>
:POWer:GAIN?

These commands set/query the power gain of the digital analyzer when in hold mode (:POW:GAIN:MODE 'Hold').

Syntax

```
DGAN:POW:GAIN '0 dB'
              '6 dB'
              '12 dB'
              '18 dB'
              '24 dB'
              '30 dB'
              '36 dB'
              '42 dB'
              '48 dB'
              '54 dB'
              '60 dB'
              '66 dB'
              '72 dB'
DGAN:POW:GAIN?
```

Screen/Field Equivalent

DGAN:POW:GAIN controls the lower subfield of the **Pwr Gain** field on the TDMA TEST screen when the **Measurement** field is set to **Avg Pwr** and the upper **Pwr Gain** subfield is set to **Hold**.

:POWer:GAIN:MODE <string>
:POWer:GAIN:MODE?

This command queries the power gain mode of the digital analyzer.

Syntax

```
DGAN:POW:MODE 'Auto'
              'Hold'
DGAN:POW:MODE?
```

Screen/Field Equivalent

DGAN:AUTO:POW:MODE controls the **Auto/Hold** subfield of the **Pwr Gain** field on the TDMA TEST screen. This field appears when the **Measurement** field is set to **Avg Pwr**.

:POWer:ZERO

This command zeros the average power measurement.

Syntax

```
DGAN:POW:ZERO
```

Screen/Field Equivalent

DGAN:POW:ZERO controls the **Avg Pwr**, **Zero** field on the TDMA TEST screen. This field appears when the **Measurement** field is set to **Avg Pwr**.

:SCLK <string>
:SCLK?

These commands set/query sample clock rate for the digital analyzer. The 121.5 kHz, 1 MHz, and 2.5 MHz clocks are provided by the digital generator. ANL CK IN is provided by an external source connected to the TDMA ANALYZER INPUTS clock port. The frequency range for the external clock is dc to 48.6 kHz at TTL levels.

Syntax

```
DGAN:SCLK '121.5 kHz'
          '1 MHz'
          '2.5 MHz'
          'ANL CK IN'
DGAN:SCLK?
```

Screen/field equivalent

DGAN:SCLK controls the **Sample Clk** field on the TDMA TEST screen.

:SLOTtype <string>
:SLOTtype?

These commands set/query the type of TDMA slot (mobile or base) that the digital analyzer is to measure.

Syntax

```
DGAN:SLOT 'TDMA Mobl'
          'TDMA Base'
DGAN:SLOT?
```

Screen/field equivalent

DGAN:SLOT controls the **Slot Type** field in the digital analyzer column of the screen. This field is *not* displayed when the **Measurement** field is set to **Avg Pwr**.

:SPECial <integer>
:SPECial?

These commands set/query the special operating modes for the digital analyzer. At this time, there are no special operating modes available. This command must be set to 0.

Syntax

```
DGAN:SPEC <integer>
   !See "Integer Number Setting Syntax" on page  162.
```

Screen/field equivalent

DGAN:SPEC controls the **Special** field in the digital analyzer section (second column from left of screen) of the TDMA TEST screen.

:STATus?

This command returns the status of the digital analyzer (idle or armed).

Syntax

```
DGAN:STAT? !returns a quoted string
```

Screen/field equivalent

DGAN:STAT queries the **Dig Anl:** field in top-right window of the TDMA TEST screen.

:TRIGger:ARM

This command sets the analyzer to make a measurement as soon as it is triggered. Making changes to any settings after the DGAN:TRIG:ARM command is executed will terminate any active measurement and re-arm a new measurement at the new setting. However, if the digital generator is also active, changing field settings will cause the generator to stop sending data. The :DGEN:SEND command must be sent to commence sending data. Therefore, when making measurements with the digital generator, it is generally best to send the :DGEN:SEND command and then the DGAN:TRIG:ARM command.

Syntax

```
DGAN:TRIG:ARM
```

Screen/field equivalent

DGAN:TRIG:ARM controls the **`Arm Meas`** subfield of the **`Digital Anl`** field TDMA TEST screen.

:TRIGger:DARM

This command affects operation only when the analyzer has been armed but measurements have not yet been displayed.

Syntax

```
DGAN:TRIG:DARM
```

Screen/field equivalent

DGAN:TRIG:DARM controls the **`Disarm`** subfield of the **`Digital Anl`** field

:TRIGger:DELay <integer>
:TRIGger:DELay?

These commands set/query the number of bits that the trigger signal will be delayed before it is sent to the digital analyzer's trigger input. This delay is applied only when the trigger type (DGAN:TRIG:TYPE) is 'ANL TG IN'.

Delaying the trigger can be useful when you need to capture a timeslot of data that is delayed relative to an external trigger.

The range of acceptable settings is from 1 to 1943 bits.

Syntax

```
DGAN:TRIG:DEL <integer>
   !See "Integer Number Setting Syntax" on page  162.

DGAN:TRIG:DEL?
```

Screen/field equivalent

DGAN:TRIG:DEL controls the **`Trig Delay`** field on the TDMA TEST screen.

:TRIGger:MODE <string>
:TRIGger:MODE?

These commands set/query the digital analyzer's trigger mode.

- 'Single' causes the analyzer to make a single measurement each time it is armed (DGAN:TRIG:ARM).
- 'Cont' causes the analyzer to continuously repeat measurements and update measurement results on the display.

Syntax

```
DGAN:TRIG:MODE 'Single'
               'Cont'
DGAN:TRIG:MODE?
```

Operating Considerations

NOTE When using single triggering mode on the digital analyzer (DGAN:TRIG:MODE 'Single') the RF analyzer power meter should be set to manual zeroing (RFAN:PME:ZERO:MODE 'Manual') to ensure power meter zeroing does not interrupt the TDMA measurement results. When the RF analyzer power results are needed, the power meter can be zeroed as needed (RFAN:PME:ZERO).

Screen/field equivalent

DGAN:TRIG:MODE controls the **`Single/Cont`** subfield of the **`Digital Anl`** field.

:TRIGger:TYPE <string>
:TRIGger:TYPE?

These commands set/query the trigger conditions for the digital analyzer.

- 'Amptd Hi', 'Amptd Mid', and 'Amptd Low' uses low-to-high amplitude transitions in pulsed carriers as the trigger source. The trigger thresholds are at –6 dB (Hi), –12 dB (Mid), and –18 dB (Low) from the Max Abs level. The digital analyzer's input (DGAN:INP) must be set to 'Int If'.
- 'Immediate' causes the analyzer to be triggered immediately after it is armed (DGAN:TRIG:ARM).
- 'ANL TG IN' causes the analyzer to be triggered by the signal at the TDMA ANALYZER INPUTS TRIGGER port.
- 'Frame Clk' causes the analyzer to be triggered by the 25 Hz frame clock provided by the digital generator.
- '2x Frame' causes the analyzer to be triggered by the 50 Hz, 2× frame clock provided by the digital generator.

Syntax

```
DGAN:TRIG:TYPE  'Amptd Hi'
                'Amptd Mid'
                'Amptd Low'
                'Immediate'
                'ANLG TG IN'
                'Frame Clk'
                '2x Frame'
DGAN:TRIG:TYPE?
```

Screen/field equivalent

DGAN:TRIG:TYPE controls the **`Trig Type`** field on the TDMA TEST screen.

DGCommon subsystem

:DTAFields <string>
:DTAFields?

These commands set/query whether the sequence of data output by the digital generator and measured by the digital analyzer will be random or repeating.

- 'Random' causes the digital generator output a random data pattern over the number of bursts selected. It also causes the digital analyzer to use the same data pattern output by the generator for measuring BERT. Random is generally the best choice for BERT measurements.
- 'Rpt' causes the data pattern selected with the DGC:MSSG command to be repeated in each slot. Rpt (repeat) is useful when you want a stable data pattern for troubleshooting, for repeatable power measurements, or for EVM measurements.

Syntax

```
DGC:DTAF 'Random'
         'Rpt'
DGC:DTAF?
```

Screen/field equivalent

DGC:DTAF controls the **Data Fields** field on the TDMA TEST screen.

:DVCC <integer>
:DVCC?

These commands set/query the digital verification color code to be used by the digital analyzer and digital generator. The range of acceptable values is 0 to 255. The appropriate setting is determined by the unit-under-test.

Syntax

```
DGC:DVCC <integer>
   !See "Integer Number Setting Syntax" on page  162.
DGC:DVCC?
```

Screen/field equivalent

DGC:DVCC controls the **DVCC** field on the TDMA TEST screen.

:MSSG <string>
:MSSG?

These commands set/query the type of data that the digital generator will transmit. It also specifies the type of data the digital analyzer will expect to receive for a BERT measurement.

- 'Raw BER' selects uncoded (non-convolutionally encoded) data.
- 'FACCH' selects a fast associated control channel data pattern.
- 'SACCH' selects a slow associated control channel data pattern.
- 'Speech' selects encoded speech.
- 'Call Proc' selects a FACCH data pattern, supplied by the user, and output it on a specified slot number. This FACCH pattern and the slot number must be defined via GPIB. See "Sending FACCH Messages" on page 259.
- 'Talk Back' selects a mode in which the instrument echoes back what is spoken into the radio.
- 'Ericcson' selects the data pattern for making a bit error measurement on Ericsson base station transceivers.
- Custom 1 through 3 are provided for selecting other custom data patterns that have been installed

Syntax

```
DGC:MSSG 'Raw BER'
         'FACCH'
         'SACCH'
         'Speech'
         'Call Proc'
         'Talk Back'
         'Ericsson'
         'Custom 1'
         'Custom 2'
         'Custom 3'
DGC:MSSG?
```

Screen/field equivalent

DGAN:MSSG controls the **Mssg Type** field on the TDMA TEST screen.

:SETup <string>
:SETup?

These commands set/query the standard setups for the various TDMA measurements. When DGC:SET is changed, various other settings are also changed to factory pre-set values.

Syntax

```
DGC:SET 'Preset'
        'EVM Base'
        'EVM Mobl'
        'EVM 10'
        'ACP Base'
        'ACP Mobl
        'BER Mobl'
        'Eric Base'
        'Sync Loc'
DGC:SET?
```

Screen/field equivalent

DGC:SET controls the **`Std Setup`** field on the TDMA TEST screen.

:SYNC <integer>
:SYNC?

These commands set/query which sync word the digital generator will output as part of its time slot data. It also specifies which sync word the digital analyzer will use to align its measurement with the appropriate time slots.

For EVM measurements, the digital analyzer uses the sync word only if DGAN:CORR 'Sync' is used. 'Sync' must be used for EVM measurements made on mobile radios.

For BERT or Sync Search measurements, the digital analyzer always uses the sync word to align its measurements.

- 1 specifies time slots 1 and 4
- 2 specifies time slots 2 and 5
- 3 specifies time slots 3 and 6
- 4, 5, and 6 (should not be used for the digital generator)

Syntax

```
DGC:SYNC <integer>
   !See "Integer Number Setting Syntax" on page  162.

DGC:SYNC?
```

Screen/field equivalent

DGC:SYNC controls the **Sync Word** field on the TDMA TEST screen.

:TNSLots <integer>
:TNSLots?

These commands set/query the number of training slots the digital generator outputs before outputting the data to be measured. The training slots contain a predetermined data pattern. Training slots are necessary to enable the analyzer to align its demodulated measurements such as BERT.

The valid range of values for training slot is 0 to 500.

When a BERT measurement is made, a measurement field is displayed that indicates the number of training slots received before synchronization occurred.

Syntax

```
DGC:TNSL <integer>
   !See "Integer Number Setting Syntax" on page  162.

DGC:TNSL?
```

Screen/field equivalent

DGC:TNSL controls the **`Train Slots`** field on the TDMA TEST screen.

DGGenerator subsystem

:DATA:DELay <integer>
:DATA:DELay?

These commands set/query the number of bits that the digital generator will wait to send its baseband data after the :DGEN:SEND command is received and the frame clock goes high. This delay is valid only for internal data. External data is not affected.

The data delay is important when you are aligning the Test Set's data pattern to a base station that requires proper time alignment. The appropriate amount of delay depends on the particular base station that you are testing

The range of acceptable settings for delay is 0 to 1943 bits.

When 'Int' is specified in the DGG:DATA:SOUR command, the delay affects the baseband signal sent to the instrument's IQ modulator, digital analyzer, and TDMA OUTPUTS connector.

Mobile radios will adjust to the Test Set, so the delay is not required for mobile radio tests.

Syntax

```
DGG:DATA:DEL <integer>
   !See "Integer Number Setting Syntax" on page  162.

DGG:DATA:DEL?
```

Screen/field equivalent

DGG:DATA:DEL controls the **Data Delay** field on the TDMA TEST screen.

:DATA:SOURce <string>
:DATA:SOURce?

These commands set/query the data source for the IQ modulator, digital analyzer, and TDMA OUTPUTS connector.

- 'Int' selects the baseband signal provided by the instrument's digital analyzer.
- 'GEN IN' selects the signal at the GENERATOR DATA IN connector.

Syntax

```
DGG:DATA:SOUR 'Int'
      'GEN IN'
DGG:DATA SOUR?
```

Screen/field equivalent

DGG:DATA:SOUR controls the **Data Source** field on the TDMA TEST screen.

:NERRors <integer>
:NERRors?

These commands set/query the number of bit errors the digital generator includes in the data pattern each time it sends its data. The errors can be used to validate a bit error measurement. Adding a known number of errors can be useful for verifying that the measurement results reflect the actual conditions of the input signal.

Up to 15 errors can be added.

Syntax

```
DGG:NERR <integer>
   !See "Integer Number Setting Syntax" on page  162.
DGG:NERR?
```

Screen/field equivalent

DGG:NERR controls the **Add Errors** field on the TDMA TEST screen.

:NMSLots <integer>
:NMSLots?

These commands set/query the total number of slots of data (not including training slots) that the digital generator will output when the DGG:SEND command is executed.

The number of slots determines the number of bits over which a BERT measurement is made, and as a result, the length of time it takes to compute data before it is sent.

Syntax

```
DGG:NMSL <integer>
   !See "Integer Number Setting Syntax" on page  162.

DGG:NMSL?
```

Screen/field equivalent

DGG:NMSL controls the **Num Slots** field in the digital generator section (third column from left of screen) of the TDMA TEST screen.

:PATH <string>
:PATH?

These commands set/query whether or not the RF input signal is IQ modulated.

Syntax

```
DGG:PATH 'Bypass'

          'IQ'

DGG:PATH?
```

Screen/field equivalent

DGG:PATH controls the **RF Path** field on the TDMA TEST screen.

l:SEND

This command causes the digital generator to begin sending data. The data is sent immediately unless a delay is entered using the DGG:DATA:DELAY command.

When making BERT measurements, it is generally best to send this command prior to arming the digital analyzer. This ensures that the training slots and transmitted data are aligned with the analyzer.

Syntax

```
DGG:SEND
```

Screen/field equivalent

DGG:SEND control the **Send** subfield of the **Digital Gen** field on the TDMA TEST screen.

:SLOTtype <string>
:SLOTtype?

These commands set/query the slot type output by the digital generator

Syntax

```
DGG:SLOT 'TDMA Mobl'
         'TDMA Base'
DGG:SLOT?
```

Screen/field equivalent

DGG:SLOT controls the **Slot Type** field on the TDMA TEST screen.

:SPECial <integer>
:SPECial?

These commands set/query the special operating modes for the digital generator. At this time, there are no special operating modes available. This command must be set to 0.

Syntax

```
DGG:SPEC <integer>
   !See "Integer Number Setting Syntax" on page  162.
DGG:SPEC?
```

Screen/field equivalent

DGG:SPEC controls the **Special** field in the digital generator section (fourth column from left of screen) of the TDMA TEST screen.

:STATus?

This command queries the status of the digital generator (idle or sending).

Syntax

```
DGG:STAT?
```

Screen/field equivalent

DGG:STAT queries the **Dig Gen:** field in the top right window of the TDMA TEST screen.

:STOP

This command causes the digital generator to stop sending data. Making changes to other settings on the TDMA TEST screen can also cause the generator to stop sending data.

Syntax

```
DGG:STOP
```

Screen/field equivalent

DGG:STOP control the **Stop** subfield of the **Digital Gen** field on the TDMA TEST screen.

DISPlay subsystem

The DISPlay subsystem controls the display of screens. A screen should be displayed before a measurement from that screen is made.

DISPlay
DISPlay?

DISP sets/queries which screen is displayed. You use the DISP REM command to lock the Test Set's display.

Syntax

```
DISP AFANalyzer !AF ANALYZER screen
CONFigure !INSTRUMENT CONFIGURE screen
DECoder !SIGNALING DECODER screen
ENCoder|AFG2 !SIGNALING DECODER screen
HELP !HELP screen
IOConfigure !I/O CONFIGURE screen
MESSages !MESSAGES screen
OSCilloscope !SCOPE screen
PCONfigure !PRINTER CONFIGURE screen
RFANalyzer !RF ANALYZER screen
RFGen !RF GENERATOR screen
SANalyzer !SPEC ANL screen
SERVice !SERVICE screen
TCONfigure !TESTS (External  Devices) screen
TDMA !TDMA Test screen
REMote !locks the display
DISP? !returns the name of the screen being displayed
```

Integer Number Setting Syntax

This syntax is for setting values of commands which require integer values. It is to be used with commands which call for the Integer Number Setting Syntax.

An example of a command that requires the Integer Setting Syntax is the RFANalyzer:RFCHannel command (see "RFANalyzer subsystem" on page 213).

Syntax

```
:Previous Syntax <integer_value> !decimal value
:Previous Syntax #B<Binary_integer_value> !maximum 32 bits
:Previous Syntax #O<Octal_integer_value>
:Previous Syntax #H<Hexadecimal_integer_value>
:Previous Syntax:INCRement UP !Increments the present value
:Previous Syntax:INCRement DOWN !Decrements the present value
:Previous Syntax? !Query Returns the present value
```

Example 2-1 Examples

```
RFAN:RFCH 47
RFAN:RFCH #B101111 !sets channel to 47 binary
RFAN:RFCH #O57 !sets channel to 47 octal
RFAN:RFCH #H2F !sets channel to 47 hexadecimal
RFAN:RFCH:INCR UP !increments by 1
RFAN:RFCH:INCR DOWN !decrements by 1
```

MEASure subsystem

The MEAS subsystem has a set of unique commands. These are the <meas cmnd> set. They control features of the Test Set such as setting measurement limits, units and the meters. See "Number Measurement Syntax" on page 191 for more details about these commands.

Most commands have both a <meas cmnd> parameter and a query command.

- The command using the <meas cmnd> allows you to set certain parameters of the measurement such as limits, averages, and units.
- The query command is the command that reads the measurement and returns a value.

:RESet

This command resets all measurements in progress.

Syntax

```
MEAS:RESET
```

Screen/field equivalent

MEAS:RESET does not have an equivalent control field on the Test Set.

:AFRequency:ACLevel <meas cmnd>
:AFRequency:ACLevel?

These commands set/query the AC level measurement. It measures the AC level of the audio source (SSB Demod, Audio In, Ext Mod, or Audio Out) as selected by the AFAN:INP command on page 45.

Syntax

```
MEAS:AFR:ACL <meas cmd>
    !See "Number Measurement Syntax" on page 191.

MEAS:AFR:ACL? !returns real value
```

Screen/field equivalent

MEAS:AFR:ACL? reads the **AC Level** measurement field on the AF ANALYZER screen when the **AF Anl In** field is set to **Audio In**, **Audio Out**, **Ext Mod**, or **SSB Demod**. This measurement is also displayed on the RF ANALYZER and RF GENERATOR screens.

:AFRequency:AM <meas cmnd>
:AFRequency:AM?

These commands set/query the AM depth measurement. To use this measurement you must select either the AM Mod or AM Demod audio source (AFAN:INP).

Syntax

```
MEAS:AFR:AM <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:AM? !returns real value
```

Example

```
MEAS:AFR:AM:METer ON !displays the measurement in the meter
```

Screen/field equivalent

MEAS:AFR:AM? reads the **AM Depth** measurement field on the AF ANALYZER screen when the **AF Anl In** field is set to **AM Mod**, or **AM Demod**. This measurement is also displayed on the RF ANALYZER and RF GENERATOR screens.

:AFRequency:DCAM <meas cmnd>
:AFRequency:DCAM?

These commands set/query the DC AM measurement. To use this measurement, you must have the DC level measurement selected (see MEAS:AFR:SEL on page 168), and you must be using the AM Demod or AM Mod audio source (see AFAN:INP on pag e45).

Syntax

```
MEAS:AFR:DCAM <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:DCAM? !returns a real value
```

Example

```
MEAS:AFR:DCAM:AVERage 4 !averages DCAM over 4 measurements

MEAS:AFR:DCAM? !returns the measured value
```

Screen/field equivalent

MEAS:AFR:DCAM? reads the **DC Level** (%) measurement field on the AF ANALYZER screen when the **AF Anl In** field is set to **AM Mod**, or **AM Demod**. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:DCFM <meas cmnd>
:AFRequency:DCFM?

These commands set/query the DC FM measurement. To use this measurement, you must have the DC level measurement selected (see MEAS:AFR:SEL on page 168), and you must be using the FM Demod or FM Mod audio source (see AFAN:INP on pag e45).

Syntax

```
MEAS:AFR:DCFM <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:DCFM? !returns a real value
```

Example

```
MEAS:AFR:DCFM:AVERage 4 !averages DCFM over 4 measurements

MEAS:AFR:DCFM? !returns the measured value
```

Screen/field equivalent

MEAS:AFR:DCFM? reads the **DC Level** (kHz) measurement field on the AF ANALYZER screen when the **AF Anl In** field is set to **FM Mod**, or **FM Demod**. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:DCVolts <meas cmnd>
:AFRequency:DCVolts?

These commands set/query the DC voltmeter. To use this measurement, you must have the DC level measurement selected (see MEAS:AFR:SEL on page 168), and have selected one of the following audio sources: SSB Demod, Audio In, Ext Mod, or Audio Out (see AFAN:INP on page 45).

Syntax

```
MEAS:AFR:DCV <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:DCV? !returns a real value
```

Example

```
MEAS:AFR:DCV mV !sets the measurement unit to mV

MEAS:AFR:DCV? !returns the real value in millivolts
```

Screen/field equivalent

MEAS:AFR:DCV? reads the **DC Level** (V) measurement field on the AF ANALYZER screen when the **AF Anl In** field is set to **Audio In**, **Audio Out**, **Ext Mod**, or **SSB Demod**. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:DISTortion <meas cmnd>
:AFRequency:DISTortion?

These commands set/query the distortion measurement. This measurement is selected by using the MEAS:AFR:SEL 'Distn' command (see page 168). Read the measurement results using the :AFR:DIST query command.

Syntax

```
MEAS:AFR:DIST <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:DIST? ! returns a real value
```

Example

```
MEAS:AFR:SEL 'DISTN' ! selects the distortion measurement

MEAS:AFR:DIST? !returns the measured value
```

Screen/field equivalent

MEAS:AFR:DIST? reads the **Distn** measurement field on the AF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:FM <meas cmnd>
:AFRequency:FM?

These commands set/query the FM deviation measurement. This measurement is active when FM Mod or FM Demod is selected by using the AFAN:INP command (see page 45) and SNR is not selected by the MEAS:AFR:SEL command (see page 168).

Syntax

```
MEAS:AFR:FM <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:FM? !returns real value
```

Example

```
MEAS:AFR:FM:AVERage:RESet !resets the number of averages

MEAS:AFR:FM? !returns the measured value
```

Screen/field equivalent

MEAS:AFR:FM? reads the **FM Deviation** measurement field on the AF ANALYZER screen when the **AF Anl In** field is set to **FM Mod**, or **FM Demod**. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:FREQuency <meas cmnd>
:AFRequency:FREQuency?

These commands set/query the audio frequency measurement. This measurement is active when AF Freq is selected by using the MEAS:AFR:SEL 'AF Freq' command (see pag e168).

Syntax

```
MEAS:AFR:FREQ <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:AFR:FREQ? ! returns real value
```

Example

```
MEAS:AFR:SEL 'AF Freq' !selects the measurement

MEAS:AFR:FREQ? ! returns the measurement's value
```

Screen/field equivalent

MEAS:AFR:FREQ? reads the **AF Freq** measurement field on the AF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:SELect <meas cmnd>
:AFRequency:SELect?

These commands set/query which audio frequency measurement is displayed on the AF ANALYZER screen.These measurements are also displayed on the RF GENERATOR and RF ANALYZER screens.

Syntax

```
MEAS:AFR:SEL 'SINAD'
             'Distn'
             'SNR'
             'AF Freq'
             'DC Level'
MEAS:AFR:SEL ! returns the presently selected measurement
(string)
```

Example

```
MEAS:AFR:SEL 'AF Freq' !selects the AF Frequency measurement
```

Screen/field equivalent

MEAS:AFR:SEL selects the audio frequency measurement that will be displayed on the AF ANALYZER screen. These measurements are also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:SINAD <meas cmnd>
:AFRequency:SINAD?

These commands set/query the SINAD measurement. SINAD must first be selected using the MEAS:AFR:SEL 'SINAD' command (see :AFR:SEL on page 168).

Syntax

```
MEAS:AFR:SINAD <meas cmd> !controls the SINAD command
MEAS:AFR:SINAD? !returns the measured value
```

Example

```
MEAS:AFR:SINAD !selects the measurement
```

Screen/field equivalent

MEAS:AFR:SINAD? reads the **SINAD** measurement field on the AF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:AFRequency:SNR <meas cmnd>
:AFRequency:SNR?

These commands set/query the SNR measurement. SNR must first be selected using the MEAS:AFR:SEL 'SNR' command (see page 168).

Syntax

```
MEAS:AFR:SNR <meas cmd> !controls the SNR command

MEAS:AFR:SNR? !returns the measurement's value
```

Example

```
MEAS:AFR:SNR !displays the measurement
```

Screen/field equivalent

MEAS:AFR:SNR? reads to the **SNR** measurement field on the AF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and RF ANALYZER screens.

:DEC:AMPS|TACS:NBITs?

These commands set/query the number of bits measured by the signaling decoder in AMPS-TACS mode.

Syntax

```
MEAS:DEC:AMPS:NBIT <meas cmnd>

MEAS:DEC:AMPS:NBIT? !returns and integer value
```

Screen/field equivalent

MEAS:DEC:AMPS:NBIT? reads the **Num of Bits** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS**.

:DEC:AMPS|TACS:CDATa?

This command queries the decoded data for the control channel.

Syntax

```
MEAS:DEC:AMPS:CDAT <meas cmnd>

MEAS:DEC:AMPS:CDAT? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:AMPS:CDAT? reads the **Data (hex)** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS**, and the **Channel** field is set to **Cntl**.

:DEC:AMPS|TACS:DATA?

This command queries the decoded data for the voice channel.

Syntax

```
MEAS:DEC:AMPS:DATA <meas cmnd>

MEAS:DEC:AMPS:DATA? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:AMPS:DATA? reads the **Data (hex)** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **AMPS-TACS**, and the **Channel** field is set to **Voice**.

:DEC:DTMF:LOW:FREQuency:ABSolute <meas cmnd>
:DEC:DTMF:LOW:FREQuency:ABSolute?

These command set/query the frequency of the low tone in the DTMF pair. The MEAS:DEC:DTMF:LOW:FREQ:DISP 'Freq' command must be used to display the absolute frequency of the low tone.

Syntax

```
MEAS:DEC:DTMF:LOW:FREQ:ABS
    !See "Multiple Real Number Setting Syntax" on page  190

MEAS:DEC:DTMF:LOW:FREQ:ABS? !returns up to 20 real values
```

Screen/field equivalent

MEAS:DEC:DTMF:LOW:FREQ:ABS? reads the **Lo Tone** column on the SIGNALING DECODER screen. The **Mode** field must be set to **DTMF** and the upper subfield of the **Lo Tone** field must be set to **Freq**.

:DEC:DTMF:LOW:FREQuency:ERRor <meas cmnd>
:DEC:DTMF:LOW:FREQuency:ERRor?

These commands set/query the frequency error of the low tone in the DTMF pair. The MEAS:DEC:DTMF:LOW:FREQ:DISP 'Frq Err' command must be used to display the frequency error of the low tone.

Syntax

```
MEAS:DEC:DTMF:LOW:FREQ:ERR
    !See "Multiple Real Number Setting Syntax" on page  190

MEAS:DEC:DTMF:LOW:FREQ:ERR? !returns up to 20 real values
```

Screen/field equivalent

MEAS:DEC:DTMF:LOW:FREQ:ERR? reads the **Lo Tone** column on the SIGNALING DECODER screen. The **Mode** field must be set to **DTMF** and the upper subfield of the **Lo Tone** field must be set to **Frq Err**.

:DEC:DTMF:LOW:FREQuency:DISPlay <string>
:DEC:DTMF:LOW:FREQuency:DISPlay?

These command set/query the display mode of the low tone in the DTMF pair.

Syntax

```
MEAS:DEC:DTMF:LOW:FREQ:DISP 'Freq'
                            'Frq Err'

MEAS:DEC:DTMF:LOW:FREQ:ERR?
```

Screen/field equivalent

MEAS:DEC:DTMF:LOW:FREQ:DISP controls the upper subfield of the **Lo Tone** field on the SIGNALING DECODER screen.

:DEC:DTMF:HIGH:FREQuency:ABSolute <meas cmnd>
:DEC:DTMF:HIGH:FREQuency:ABSolute?

These command set/query the frequency of the high tone in the DTMF pair. The MEAS:DEC:DTMF:HIGH:FREQ:DISP 'Freq' command must be used to display the absolute frequency of the high tone.

Syntax

```
MEAS:DEC:DTMF:HIGH:FREQ:ABS
    !See "Multiple Real Number Setting Syntax" on page 190

MEAS:DEC:DTMF:HIGH:FREQ:ABS? !returns up to 20 real values
```

Screen/field equivalent

MEAS:DEC:DTMF:HIGH:FREQ:ABS? reads the **Hi Tone** column on the SIGNALING DECODER screen. The **Mode** field must be set to **DTMF** and the upper subfield of the **Hi Tone** field must be set to **Freq**.

:DEC:DTMF:HIGH:FREQuency:ERRor <meas cmnd>
:DEC:DTMF:HIGH:FREQuency:ERRor?

These command set/query the frequency error of the high tone in the DTMF pair. The MEAS:DEC:DTMF:HIGH:FREQ:DISP 'Frq Err' command must be used to display the frequency error of the high tone.

Syntax

```
MEAS:DEC:DTMF:HIGH:FREQ:ERR
    !See "Multiple Real Number Setting Syntax" on page 190

MEAS:DEC:DTMF:HIGH:FREQ:ERR? !returns up to 20 real values
```

Screen/field equivalent

MEAS:DEC:DTMF:HIGH:FREQ:ERR? reads the **Hi Tone** column on the SIGNALING DECODER screen. The **Mode** field must be set to **DTMF** and the upper subfield of the **Hi Tone** field must be set to **Frq Err**.

:DEC:DTMF:HIGH:FREQuency:DISPlay <string>
:DEC:DTMF:HIGH:FREQuency:DISPlay?

These command set/query the display mode of the high tone in the DTMF pair.

Syntax

```
MEAS:DEC:DTMF:HIGH:FREQ:DISP 'Freq'
                              'Frq Err'
MEAS:DEC:DTMF:HIGH:FREQ:ERR?
```

Screen/field equivalent

MEAS:DEC:DTMF:HIGH:FREQ:DISP controls the upper subfield of the **Hi Tone** field on the SIGNALING DECODER screen.

:DEC:DTMF:TIME:ON <meas cmnd>
:DEC:DTMF:TIME:ON?

These command set/query the timing of the DTMF frequencies.

Syntax

```
MEAS:DEC:DTMF:TIME:ON
    !See "Multiple Real Number Setting Syntax" on page 190
MEAS:DEC:DTMF:TIME:ON? !returns up to 20 real values
```

Screen/field equivalent

MEAS:DEC:DTMF:TIME:ON? reads the **On Time** column on the SIGNALING DECODER screen when the **Mode** field is set to **DTMF**.

:DEC:DTMF:TIME:OFF <meas cmnd>
:DEC:DTMF:TIME:OFF?

These command set/query the timing of the DTMF frequencies.

Syntax

```
MEAS:DEC:DTMF:TIME:OFF
    !See "Multiple Real Number Setting Syntax" on page 190
MEAS:DEC:DTMF:TIME:OFF? !returns up to 20 real values
```

Screen/field equivalent

MEAS:DEC:DTMF:TIME:OFF? reads the **Off Time** column on the SIGNALING DECODER screen when the **Mode** field is set to **DTMF**.

:DEC:DTMF:SYMBol?

These command set/query the symbol number assigned by the encoder for each of the DTMF tones. As each tone is analyzed, the symbol that represents each tone is returned as a quoted string.

Syntax

```
MEAS:DEC:DTMF:SYMB? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:DTMF:SYMB? reads the **Sym** column on the SIGNALING DECODER screen when the **Mode** field is set to **DTMF**.

:DEC:FGENerator:FREQuency <meas cmnd>
:DEC:FGENerator:FREQuency?

These commands set/query the frequency of the signal generated by the function generator.

Syntax

```
MEAS:DEC:FGEN:FREQ <meas cmnd>

MEAS:DEC:FGEN:FREQ? !returns and integer value
```

Screen/field equivalent

MEAS:DEC:FGEN:FREQ? reads the **Frequency** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **Func Gen**.

:DEC:NAMPs|NTACs:NBITs <meas cmnd>
:DEC:NAMPs|NTACs:NBITs?

These commands set/query the number of bits measured by the signaling decoder in NAMP-NTAC mode.

Syntax

```
MEAS:DEC:NAMP:NBIT <meas cmnd>

MEAS:DEC:NAMP:NBIT? !returns and integer value
```

Screen/field equivalent

MEAS:DEC:NAMP:NBIT? reads the **Num of Bits** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP–NTAC**.

:DEC:NAMPs|NTACs:RECC:DATA?

This command reads the decoded RECC data, serially, as it is received.

Syntax

```
MEAS:DEC:NAMP:RECC:DATA? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:NAMP:CDAT? reads the **RECC Data (hex)** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC, the Measure field is set to Data and the Channel field is set to Cntl**

:DEC:NAMPs|NTACs:RVC:DATA?

This command reads the decoded RVC data, serially, as it is received.

Syntax

```
MEAS:DEC:NAMP:RVC:DATA? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:NAMP:RVC:DATA? reads the **RVC Data (hex)** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC**, the **Measure** field is set to **Data** and the **Channel** field is set to **Voice**.

:DEC:NAMPs|NTACs:DSAT:DATA?

This command reads the decoded DSAT/DST data, serially, as it is received.

Syntax

```
MEAS:DEC:NAMP:DSAT:DATA? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:NAMP:DSAT:DATA? reads the **DSAT/DST (hex)** measurement field on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC, the Measure field is set to DSAT and the Channel field is set to Voice**

:DEC:NAMP:DTMF:LOW:FREQuency:ABSolute <meas cmnd>
:DEC:NAMP:DTMF:LOW:FREQuency:ABSolute?

These commands set/query the frequency of the low tone in the DTMF pair. The MEAS:DEC:NAMP:DTMF:LOW:DISP 'Freq' command must be used to display the absolute frequency of the low tone.

Syntax

```
MEAS:DEC:NAMP:DTMF:LOW:FREQ:ABS
    !See "Multiple Real Number Setting Syntax" on page 190

MEAS:DEC:NAMAP:DTMF:LOW:FREQ:ABS? !returns up to 19 real
values
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:LOW:FREQ:ABS? reads the **Lo Tone** column on the SIGNALING DECODER screen when the **Mode** field is set to **NAMP-NTAC**, the **Measure** field is set to **DTMF**, and the upper subfield of the **Lo Tone** field is set to **Freq**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:LOW:FREQuency:ERRor <meas cmnd>
:DEC:NAMP:DTMF:LOW:FREQuency:ERRor?

These commands set/query the frequency error of the low tone in the DTMF pair. The MEAS:DEC:NAMP:DTMF:LOW:DISP 'Frq Err' command must be used to display the frequency error of the low tone.

Syntax

```
MEAS:DEC:NAMP:DTMF:LOW:FREQ:ERR
    !See "Multiple Real Number Setting Syntax" on page 190

MEAS:DEC:NAMP:DTMF:LOW:FREQ:ERR? !returns up to 19 real
values
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:LOW:FREQ:ERR? reads the **Lo Tone** column on the SIGNALING DECODER screen when **Mode** field is set to **NAMP-NTAC**, the **Measure** field is set to **DTMF**, and the upper subfield of the **Lo Tone** field is set to **Frq Err**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:LOW:DISPlay <string>
:DEC:NAMP:DTMF:LOW:DISPlay?

These commands set/query the display mode of the low tone in the DTMF pair.

Syntax

```
MEAS:DEC:NAMP:DTMF:LOW:DISP 'Freq'
                            'Frq Err'
MEAS:DEC:NAMP:DTMF:LOW:ERR?
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:LOW:DISP controls the upper subfield of the **Lo Tone** field on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC** and the **Measure** field is set to **DTMF**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:HIGH:FREQuency:ABSolute <meas cmnd>
:DEC:NAMP:DTMF:HIGH:FREQuency:ABSolute?

These commands set/query the frequency of the high tone in the DTMF pair. The MEAS:DEC:NAMP:DTMF:HIGH:DISP 'Freq' command must be used to display the absolute frequency of the high tone.

Syntax

```
MEAS:DEC:NAMP:DTMF:HIGH:FREQ:ABS
    !See "Multiple Real Number Setting Syntax" on page 190
MEAS:DEC:NAMP:DTMF:HIGH:FREQ:ABS? !returns up to 19 real
values
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:HIGH:FREQ:ABS? reads the **Hi Tone** column on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC**, the **Measure** field is set to **DTMF**, and the upper subfield of the **Hi Tone** field is set to **Freq**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:HIGH:FREQuency:ERRor <meas cmnd>
:DEC:NAMP:DTMF:HIGH:FREQuency:ERRor?

These commands set/query the frequency error of the high tone in the DTMF pair. The MEAS:DEC:NAMP:DTMF:HIGH:DISP 'Frq Err' command must be used to display the frequency error of the high tone.

Syntax

```
MEAS:DEC:NAMP:DTMF:HIGH:FREQ:ERR
    !See "Multiple Real Number Setting Syntax" on page  190

MEAS:DEC:NAMP:DTMF:HIGH:FREQ:ERR? !returns up to 19 real
values
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:HIGH:FREQ:ERR? reads the **Hi Tone** column on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC**, the **Measure** field is set to **DTMF**, and the upper subfield of the **Hi Tone** field is set to **Frq Err**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:HIGH:DISPlay <string>
:DEC:NAMP:DTMF:HIGH:DISPlay?

These commands set/query the display mode of the high tone in the DTMF pair.

Syntax

```
MEAS:DEC:NAMP:DTMF:HIGH:DISP 'Freq'
                             'Frq Err'

MEAS:DEC:NAMP:DTMF:HIGH:DISP:ERR?
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:HIGH:DISP controls the upper subfield of the **Hi Tone** field on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC** and the **Measure** field is set to **DTMF**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:TIME:ON <meas cmnd>
:DEC:NAMP:DTMF:TIME:ON?

These commands set/query the timing of the DTMF frequencies.

Syntax

```
MEAS:DEC:NAMP:DTMF:TIME:ON
    !See "Multiple Real Number Setting Syntax" on page 190

MEAS:DEC:NAMP:DTMF:TIME:ON? !returns up to 19 real values
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:TIME:ON? reads the **On Time** column on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC** and the **Measure** field is set to **DTMF**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:TIME:OFF <meas cmnd>
:DEC:NAMP:DTMF:TIME:OFF?

These commands set/query the timing of the DTMF frequencies.

Syntax

```
MEAS:DEC:NAMP:DTMF:TIME:OFF
    !See "Multiple Real Number Setting Syntax" on page 190

MEAS:DEC:NAMP:DTMF:TIME:OFF? !returns up to 19 real values
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:TIME:OFF? reads the **Off Time** column on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC** and the **Measure** field is set to **DTMF**, and the **Channel** field is set to **Voice**.

:DEC:NAMP:DTMF:SYMBol?

This command queries the symbol number assigned by the encoder for each of the DTMF tones. As each tone is analyzed, the symbol that represents each tone is returned as a quoted string.

Syntax

```
MEAS:DEC:NAMP:DTMF:SYMB? !returns a quoted string
```

Screen/field equivalent

MEAS:DEC:NAMP:DTMF:SYMB? reads the **Sym** column on the SIGNALING DECODER screen when the **Mode** field is set **NAMP-NTAC** and the **Measure** field is set to **DTMF**, and the **Channel** field is set to **Voice**.

DGAN:LABel? <integer>

This command returns the names of the measurements (labels) that are made for the measurement selected with the DGAN:MEAS command.

This command is used in conjunction with the MEAS:DGAN:VAL? query. For an example of how to parse the labels with their corresponding values, see "Reading TDMA Test Results" on page 256.

For more information about the value returned for of the Status (0) label, refer to "Status Codes for Digital Analyzer Measurements" in the *Reference Guide*.

Syntax

```
MEAS:DGAN:LAB? <integer>
```

Screen/field equivalent

MEAS:DGAN:LAB? reads the names of the measurements displayed in the measurement results window of the TDMA TEST screen.

:DGAN:VALues <meas cmd>
:DGAN:VALues?

This command reads the measurement values for the measurement selected with the DGAN:MEAS command. Measurement values are returned as a comma-separated list of floating-point numbers that correspond to the measurement labels (MEAS:DGAN:LAB). For an example of how to parse the labels with their corresponding values, see "Reading TDMA Test Results" on page 256.

This command uses the :STATe command of the "Number Measurement Syntax" on page 191.

Syntax

```
MEAS:DGAN:VAL:STAT

MEAS:DGAN:VAL?
```

Screen/field equivalent

MEAS:DGAN:VAL? reads the numeric results of the measurements displayed in the measurement results window of the TDMA TEST screen.

:OSCilloscope:MARKer:LEVel:AM <meas cmnd>
:OSCilloscope:MARKer:LEVel:AM?

These commands set/query the AM depth measurement at the oscilloscope's marker position. For this measurement to be valid, you must have AM Mod or AM Demod chosen as the audio input (see AFAN:INP on page 45).

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:OSC:MARK:LEV:AM <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:OSC:MARK:LEV:AM?
```

Example

```
MEAS:OSC:MARK:LEV:AM?
```

Screen/field equivalent

MEAS:OSC:MARK:LEV:AM? reads the **Lvl** measurement field on the SCOPE screen. The **AF Anl In** field on the AF ANALYZER screen must be set to **AM Mod** or **AM Demod** to measure AM depth in this field.

:OSCilloscope:MARKer:LEVel:FM <meas cmnd>
:OSCilloscope:MARKer:LEVel:FM?

These commands set/query the FM deviation measurement at the oscilloscope's marker position. For this measurement to be valid, you must have FM Mod or FM Demod chosen as the audio input (see AFAN:INP on page 45)

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:OSC:MARK:LEV:FM <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:OSC:MARK:LEV:FM?
```

Example

```
MEAS:OSC:MARK:LEV:FM?
```

Screen/field equivalent

MEAS:OSC:MARK:LEV:FM? reads the **Lvl** measurement field on the SCOPE screen. The **AF Anl In** field on the AF ANALYZER screen must be set to **FM Mod** or **FM Demod** to measure FM deviation in this field.

:OSCilloscope:MARKer:LEVel:VOLTs <meas cmnd>
:OSCilloscope:MARKer:LEVel:VOLTs?

These commands set/query the voltage measurement at the oscilloscope's marker position. For this measurement to be valid, you must have Audio In, Audio Out, Ext Mod, or SSB Demod chosen as the audio input (see AFAN:INP on page 45)

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:OSC:MARK:LEV:VOLT <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:OSC:MARK:LEV:VOLT?
```

Example

```
MEAS:OSC:MARK:LEV:VOLT?
```

Screen/field equivalent

MEAS:OSC:MARK:LEV:VOLT? reads the **Lvl** measurement field on the SCOPE screen. The **AF Anl In** field on the AF ANALYZER screen must be set to **Audio In**, **Audio Out**, or **Ext Mod**, **SSB Demod** to measure voltage in this field.

:OSCilloscope:MARKer:TIME <meas cmnd>
:OSCilloscope:MARKer:TIME?

These commands set/query the time elapsed from the trigger event to the marker location.

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:OSC:MARK:TIME <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:OSC:MARK:TIME? !returns a real number
```

Example

```
MEAS:OSC:MARK:TIME? !displays the measurement
```

Screen/field equivalent

MEAS:OSC:MARK:TIME? reads the **Time** field on the **Marker** menu of the SCOPE screen.

:OSCilloscope:TRACe?

This command returns an array of 417 real values, corresponding to points on the oscilloscope's display. 0 corresponds to the first value (left side of trace display) and 416 is the last value (right side of the trace display).

Syntax

```
MEAS:OSC:TRAC?
```

Screen/field equivalent

MEAS:OSC:TRAC has no corresponding field on the SCOPE screen.

:RFRequency:SELect <string>
:RFRequency:SELect?

These commands set/query the RF measurements for the RF analyzer.

Syntax

```
MEAS:RFR:SEL <meas cmd>
```

!See "Number Measurement Syntax" on page 191.

```
MEAS:RFR:SEL?
```

Example

```
MEAS:RFR:SEL 'Frequency'
             'Freq Error'
MEAS:RFR:SEL?
```

Screen/field equivalent

MEAS:RFR:SEL selects which measurement, **Frequency** or **Freq Error** is displayed the RF ANALYZER screen. These measurements are also displayed on the RF GENERATOR and AF ANALYZER screens.

:RFRequency:FREQuency:ABSolute <meas cmnd>
:RFRequency:FREQuency:ABSolute?

These commands set/query the RF frequency measurement when the :RFR:SEL 'Frequency' command is used.

Syntax

```
:RFR:FREQ:ABS <meas syntax>
   !See "Number Measurement Syntax" on page 191.

:RFR:FREQ:ABS?
```

Screen/field equivalent

MEAS:RFR:FREQ:ABS? reads the **Frequency** measurement field on the RF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and AF ANALYZER screens.

:RFRequency:FREQuency:ERRor <meas cmnd>
:RFRequency:FREQuency:ERRor?

These commands set/query the RF frequency error measurement when the :RFR:SEL 'Freq Err' command is used.

Syntax

```
:RFR:FREQ:ERR <meas syntax>
   !See "Number Measurement Syntax" on page 191.

:RFR:FREQ:ERR?
```

Screen/field equivalent

MEAS:RFR:FREQ:ERR? reads the **Freq Error** measurement field on the RF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and AF ANALYZER screens.

:RFRequency:POWer <meas cmnd>
:RFRequency:POWer?

These commands set/query the transmitter power measurement. The measurement is either peak or sampled, as determined by the RFAN:PME:DET command on page 215.

Syntax

```
MEAS:RFR:POW <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:RFR:POW? !returns real value
```

Example

```
MEAS:RFR:POW? !returns the value
```

Screen/field equivalent

MEAS:RFR:POW? reads the **TX Power** measurement field on the RF ANALYZER screen. This measurement is also displayed on the RF GENERATOR and AF ANALYZER screens.

:SANalyzer:MARKer:DELTa:FREQuency <meas cmnd>
:SANalyzer:MARKer:DELTa:FREQuency?

These commands set/query the delta marker frequency measurement. This measurement is the frequency of the delta marker minus the frequency of the normal marker. If the delta marker is to the right of the normal marker, the delta frequency is positive. If the delta marker is to the left of the normal marker, the delta frequency is negative.

The units for this measurement are GHz, MHz, kHz, and Hz.

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:SAN:MARK:DELT:FREQ <meas cmd>
    !See "Number Measurement Syntax" on page 191.

MEAS:SAN:MARK:DELT:FREQ? !returns real value
```

Example

```
SAN:MARK:PEAK

MEAS:SAN:MARK:DELT:FREQ? !returns the value
```

Screen/field equivalent

MEAS:SAN:MARK:DELT:FREQ? reads the **Delta Mrkr**, **Freq** measurement field on the SPEC ANL screen when **Norm/Delta** field is set to **Delta** on the **Marker** controls menu.

:SANalyzer:MARKer:DELTa:LEVel <meas cmnd>
:SANalyzer:MARKer:DELTa:LEVel?

These commands set/query the delta marker level measurement. This measurement is the level of the normal marker minus the frequency of the delta marker in dBm. If the delta marker is higher than normal marker, the delta level is positive. If the delta marker is lower than the normal marker, the delta level is negative.

The units for this measurement are dB. (There is a percent unit available; however, since the spectrum analyzer level is always displayed on a logarithmic scale, linear units are inappropriate.)

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:SAN:MARK:DELT:LEV <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:SAN:MARK:DELT:LEV? !returns real value
```

Example

```
MEAS:SAN:MARK:DELT:LEV? !returns the value
```

Screen/field equivalent

MEAS:SAN:MARK:DELT:LEV? reads the **Delta Mrkr**, **Lvl** measurement field on the SPEC ANL screen when **Norm/Delta** field is set to **Delta** on the **Marker** controls menu.

:SANalyzer:MARKer[:NORMal]:FREQuency <meas cmnd>
:SANalyzer:MARKer[:NORMal]:FREQuency?

These commands set/query the frequency at the marker on the spectrum analyzer's trace.

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:SAN:MARK:NORM:FREQ <meas cmd>
    !See "Number Measurement Syntax" on page 191.

MEAS:SAN:MARK:NORM:FREQ? !returns real value
```

Example

```
MEAS:SAN:MARK:NORM:FREQ? !returns the value
```

Screen/field equivalent

MEAS:SAN:MARK[:NORM]:FREQ? reads the **Freq** measurement field on the SPEC ANL screen.

:SANalyzer:MARKer[:NORMal]:LEVel <meas cmnd>
:SANalyzer:MARKer[:NORMal]:LEVel?

These commands set/query the RF level at the marker on the spectrum analyzer's trace.

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:SAN:MARK:NORM:LEV <meas cmd>
   !See "Number Measurement Syntax" on page 191.

MEAS:SAN:MARK:NORM:LEV? !returns real value
```

Example

```
MEAS:SAN:MARK:NORM:LEV? !returns the value
```

Screen/field equivalent

MEAS:SAN:MARK[:NORM]:LEV? reads the **Lvl** measurement field on the SPEC ANL.

:SANalyzer:TRACe?

This command returns an array of 417 real values, corresponding to points on the spectrum analyzer's display. 0 corresponds to the first value (left side of trace display) and 416 is the last value (right side of the trace display).

This measurement utilizes the Number Measurement Syntax, but does not use the :METer command.

Syntax

```
MEAS:SAN:TRAC?
```

Example

```
MEAS:SAN:TRAC? !returns the array
```

Screen/field equivalent

MEAS:SAN:TRAC has no corresponding field on the SPEC ANL screen.

Multiple Real Number Setting Syntax

This section defines the syntax to be used with commands that require the Real Number Setting Syntax, but allow multiple numbers to be set in one command.

This format is typically used for entering values that are grouped in rows or columns.

The format is the same as for the Real Number Setting Syntax, except that each real number is preceded by an integer that identifies the relative position in the list of numbers.

Syntax

```
:Previous Syntax <integer_value>,<real_value>[display  unit_of_measure]
    !integer_value is the position, real_value is the actual value

:Previous Syntax? <integer_value> !returns the value of the position

:Previous Syntax:DUNits <integer_value>,<display unit_of_measure>

    !sets the units

:Previous Syntax:DUNits? <integer_value> !returns the display units

:Previous Syntax:UNits <integer_value>,<HP-IB unit_of_measure>

:Previous Syntax:UNits? <integer_value> !Displays the HP-IB units

:Previous Syntax:INCRement <integer_value>,<incr_value>[display
unit_of_measure]

     !increments the present value

:Previous Syntax:INCRement <integer_value>,UP|DOWN

:Previous Syntax:INCRement? <integer_value> !returns the incr. value

:Previous Syntax:MODe <integer_value>,LINear|LOGarithm

     !sets mode of the command

:Previous Syntax:MODe? <integer_value> !returns mode (LIN or LOG)

:Previous Syntax:MULTiply <integer_value>!multiplies current setting

:Previous Syntax:DIVide <integer_value>!divides current setting by 10
```

Number Measurement Syntax

This syntax is used with measurement commands. It applies to both real and integer values.

This syntax is typically used with subsystems like the MEASure subsystem/

Syntax

```
:Previous Syntax:AUNits <HP-IB units> !sets the HP-IB units

:Previous Syntax:AUNits !returns the HP-IB units

:Previous Syntax:AVERage[:VALue] <real_value>
     !sets the number of averages

:Previous Syntax:AVERage? !returns the number of averages

:Previous Syntax:AVERage:RESet !resets the number of averages to 1

:Previous Syntax:AVERage:STATe 1|ON

:Previous Syntax:AVERage:STATe 0|OFF

:Previous Syntax:AVERage:STATe? !returns 1 or 0

:Previous Syntax:DUNits <display unit_of_measure>
    !sets the disp. units

:Previous Syntax:DUNits? !returns the display units

:Previous Syntax:HLIMit[:VALue] <real_value>[<units>]
     !sets the value of the High Limit for a measurement display

:Previous Syntax:HLIMit? !returns the High Limit setting

:Previous Syntax:HLIMit:DUNits <units> !display units

:Previous Syntax:HLIMit:DUNits? !returns the display units

:Previous Syntax:HLIMit:EXCeeded?
      !returns 1 or 0 to indicate if the HighLimit was exceeded

:Previous Syntax:HLIMit:RESet !resets the limit

:Previous Syntax:HLIMit:STATe 1|ON !sets state of the limit

:Previous Syntax:HLIMit:STATe 0|OFF !sets state of the limit

:Previous Syntax:HLIMit:STATe? !returns 1 or 0

:Previous Syntax:LLIMit[:VALue] <real_value>[<units>]
     !sets the value of the Low Limit for a measurement display

:Previous Syntax:LLIMit? !returns the Low Limit setting

:Previous Syntax:LLIMit:DUNits <units> !display units

:Previous Syntax:LLIMit:DUNits? !returns the display units
```

```
:Previous Syntax:LLIMit:EXCeeded?
    !returns 1 or 0 to indicate if the LowLimit was exceeded

:Previous Syntax:LLIMit:RESet !resets the limit

:Previous Syntax:LLIMit:STATe 1|ON !sets state of the limit

:Previous Syntax:LLIMit:STATe 0|OFF !sets state of the limit

:Previous Syntax:LLIMit:STATe? !returns 1 or 0

:Previous Syntax:METer[:STATe] 1|ON

:Previous Syntax:METer[:STATe] 0|OFF

:Previous Syntax:METer[:STATe]? !returns 1 or 0

:Previous Syntax:METer:HEND|LEND <real value><units>

:Previous Syntax:METer:HEND|LEND? !returns real value

:Previous Syntax:METer:HEND|LEND:DUNits <units>

:Previous Syntax:METer:HEND|LEND:DUNits?

:Previous Syntax:METer:INTerval <integer value>

:Previous Syntax:METer:INTerval? !returns integer value

:Previous Syntax:REFerence[:VALue] <real_value>[<units>]
     !sets the value of the reference for a measurement display

:Previous Syntax:REFerence? !returns the reference setting

:Previous Syntax:REFerence:DUNits <units> !display units

:Previous Syntax:REFerence:DUNits? !returns the display units

:Previous Syntax:REFerence:STATe 1|ON !sets state of the reference

:Previous Syntax:REFerence:STATe 0|OFF !sets state of the reference

:Previous Syntax:REFerence:STATe? !returns 1 or 0

:Previous Syntax:STATe 1|ON

:Previous Syntax:STATe 0|OFF

:Previous Syntax:STATe? ! returns 1 or 0

:Previous Syntax:UNits <HP-IB unit_of_measure>
   !sets the HP-IB units

:Previous Syntax:UNits? !returns the HP-IB units
```

Example 2-2 Examples

```
RFAN:FREQ 850.35MHz !sets the frequency to 850.35 MHz

RFAN:FREQ? !returns the frequency

RFAN:FREQ:DUNits GHz !changes the units to GigaHertz

RFAN:FREQ:INCR 3.5MHz !increments frequency by 3.5 MHz
```

```
RFAN:FREQ:INCR? !returns the increment value
RFAN:FREQ:MULT !multiplies the current frequency by 10
RFAN:FREQ:MULT !multiplies the current frequency by 10
   !Note that :STAT is not valid for RFAN:FREQ
```

OSCilloscope subsystem

:CONTrol
:CONTrol?

These commands set/query the oscilloscope's control menus.

Syntax

```
OSC:CONT 'Main'
         'Trigger'
         'Marker'
OSC:CONT?
```

Example

```
OSC:CONT 'Trigger' !displays the Trigger menu of the
oscilloscope
```

Screen/field equivalent

OSC:CONT controls the **Controls** field of the SCOPE screen.

:MARKer:NPEak

This command moves the marker to the minimum value of the average level of the display.

This command has no query.

Syntax

```
OSC:MARK:NPE !moves the marker to the minimum
```

Screen/field equivalent

OSC:MARK:NPE controls the **Marker To Peak–** field on the **Marker** menu of the SCOPE screen.

:MARKer:POSition <real number>
:MARKer:POSition?

These commands set/query the marker the number specified of scale divisions from the left side of the screen.

This measurement utilizes the Real Number Setting Syntax, but does not use the :STATe command

Syntax

```
OSC:MARK:POS <real number> !values 0 to 10.00

OSC:MARK:POS? !returns the present position value
```

Example

```
OSC:MARK:POS 4.5 !positions the marker 4.5 divs from the left
```

Screen/field equivalent

OSC:MARK:POS controls the **Position** field on the **Marker** menu of the SCOPE screen.

:MARKer:PPEak

This command moves the marker to the maximum value of the average level of the display.

This command has no query.

Syntax

```
OSC:MARK:PPE !moves the marker to the maximum
```

Screen/field equivalent

OSC:MARK:PPE controls the **Marker To Peak+** field on the **Marker** menu of the SCOPE screen.

:SCALe:TIME <string>
:SCALe:TIME?

These commands set/query the horizontal sweep time per division.

Syntax

```
OSC:SCAL:TIME ‘200 ms’
              '100 ms'
              '50 ms'
              '20 ms'
              '10 ms'
              '5 ms'
              '2 ms'
              '1 ms'
              '500 us'
              '200 us'
              '100 us'
              '50 us'
              '20 us'
              '10 us'
              '5 us'
              '2 us'
              '1 us'
OSC:SCAL:TIME? !returns present value
```

Example

```
OSC:SCAL:TIME ‘2 ms’ !sets scale to 2 ms
```

Screen/field equivalent

OSC:SCL:TIME controls the **`Time/div`** field on the **`Main`** menu of the SCOPE screen.

:SCALe:VERTical:AM <string>
:SCALe:VERTical:AM?

These commands set/query the vertical axis amplitude per division when AM Mod or AM Demod is selected as the audio source (see AFAN:INP on page 45).

Syntax

```
OSC:SCAL:VERT:AM '50%'
                 '20%'
                 '10%'
                 '5%'
                 '2%'
                 '1%'
                 '0.5%'
                 '0.2%'
                 '0.1%'
                 '0.05%'
OSC:SCAL:VERT:AM?
```

Example

```
OSC:SCAL:VERT:AM ‘20%’!sets the vert scale
```

Screen/field equivalent

OSC:SCAL:VERT:AM controls the **Vert/div** field on the **Main** menu of the SCOPE screen when the **AF Anl In** field on the AF ANALYZER screen is set to **AM Mod** or **AM Demod**.

:SCALe:VERTical:FM <string>
:SCALe:VERTical:FM?

These commands set/query the vertical axis amplitude per division when FM Mod or FM Demod is selected as the audio source (see AFAN:INP on page 45).

Syntax

```
OSC:SCAL:VERT:FM '50 kHz'
                 '20 kHz'
                 '10 kHz'
                 '5 kHz'
                 '2 kHz'
                 '1 kHz'
                 '500 Hz'
                 '200 Hz'
                 '100 Hz'
                 '50 Hz'
                 '20 Hz'
                 '10 Hz'
OSC:SCAL:VERT:FM?
```

Example

```
OSC:SCAL:VERT:FM ‘20 kHz’
```

Screen/field equivalent

OSC:SCAL:VERT:FM controls the **Vert/div** field on the **Main** menu of the SCOPE screen when the **AF Anl In** field on the AF ANALYZER screen is set to **FM Mod** or **FM Demod**.

:SCALe:VERTical:OFFSet <real number>
:SCALe:VERTical:OFFSet?

These commands set/query the vertical scale (DC) offset of the vertical axis of the oscilloscope display. This moves the signal up to four divisions up or down with respect to the oscilloscope's fixed center line.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
OSC:SCAL:VERT:OFFS <real number>

OSC:SCAL:VERT:OFFS?
```

Example

```
OSC:SCAL:VERT:OFFS 2.5 !moves the signal 2.5 divisions
```

Screen/field equivalent

OSC:SCAL:VERT:OFFS controls the **`Vert Offset`** field on the **`Main`** menu of the SCOPE screen.

:SCALe:VERTical:VOLTs <string>
:SCALe:VERTical:VOLTs?

These commands set/query the vertical scale of the oscilloscope display. This command is valid when the AFAN:INP command specifies one of the following sources: Audio Out, Audio In, Ext Mod, or SSB Demod.

Syntax

```
OSC:SCAL:VERT:VOLT '20 V'
                    '10 V'
                   '5 V'
                   '2 V'
                   '1 V'
                   '500 mv'
                   '200 mv'
                   '100 mv'
                   '50 mv'
                   '20 mv'
                   '10 mv'
                   '5 mv'
                   '2 mv'
                   '1 mv'
                   '500 uv'
                   '200 uv'
                   '100 uv'
                   '50 uv'
                   '20 uv'
OSC:SCAL:VERT:VOLT?
```

Example

```
OSC:SCAL:VERT:VOLT ‘5 V’!sets scal to 5V per division
```

Screen/field equivalent

OSC:SCAL:VERT:VOLT controls the **Vert/div** field on the **Main** menu of the SCOPE screen when the **AF Anl In** field on the AF ANALYZER screen is set to **Audio In**, **Audio Out**, **Ext Mod**, or **SSB Demod**.

:TRIGger:DELay <real number>
:TRIGger:DELay?

These commands set/query the trigger delay. Positive values delay the trigger, negative values apply a pre-trigger function to each measurement.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STAT, :DUN, :UNIT, :INCR:MODE, :INCR:DUN, commands.

The valid range of the delay depends on the Time/div setting. See OSC:SCAL:TIME to set the Time/div.

Syntax

```
OSC:TRIG:DEL <real> !values depend on Time/div

OSC:TRIG:DEL?
```

Example

```
OSC:TRIG:DEL 0.2 !sets to 0.2 units
```

Screen/field equivalent

OSC:TRIG:DEL controls the **Trig-Delay** field on the **Trigger** menu of the SCOPE screen.

:TRIGger:LEVel <real number>
:TRIGger:LEVel?

These commands set/query the level of the oscilloscope's trigger.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STAT, :DUN, :UNIT, :INCR:MODE, :INCR:DUN, commands.

Syntax

```
OSC:TRIG:LEV <real> !values

OSC:TRIG:LEV? !returns the level
```

Example

```
OSC:TRIG:LEV 0.4 !sets the level to 0.4 V
```

Screen/field equivalent

OSC:TRIG:LEV controls the upper subfield of the **Level(div)** field on the **Trigger** menu of the SCOPE screen.

:TRIGger:MODE <string>
:TRIGger:MODE?

These commands set/query the retriggering mode of the trigger for the oscilloscope. If 'Cont' is chosen, then the oscilloscope is triggering continuously and is ready for another measurement after one has finished. If 'Single' is chosen then the oscilloscope requires a trigger command before making another measurement.

OSC:RESet is the trigger command for the oscilloscope.

Syntax

```
OSC:TRIG:MODE 'Cont'
              'Single'
OSC:TRIG:MODE?
```

Example

```
OSC:TRIG:MODE 'Single' !sets mode to single trigger
```

Screen/field equivalent

OSC:TRIG:MODE controls the **Cont/Single** field on the **Trigger** menu of the SCOPE screen.

:TRIGger:PRETrigger <real number>
:TRIGger:PRETrigger?

These commands set/query a pretrigger for each measurement.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STAT, :DUN, :UNIT, :INCR:MODE, :INCR:DUN, commands.

Syntax

```
OSC:TRIG:PRET <real>
OSC:TRIG:PRET?
```

Screen/field equivalent

OSC:TRIG:PRET has no equivalent field in the SCOPE screen.

:TRIGger:RESet

This command triggers an oscilloscope measurement.

Syntax

```
OSC:TRIG:RES !triggers the oscilloscope
```

Screen/field equivalent

OSC:TRIG:RESet controls the **Reset** field on the **Trigger** menu of the SCOPE screen.

:TRIGger:SENSe <string>
:TRIGger:SENSe?

These commands set/query the desired edge of the trigger. 'Pos' triggers the measurement on the positive-going edge of the input signal. 'Neg' triggers on the negative-going edge.

Syntax

```
OSC:TRIG:SENS 'Pos'
              'Neg'
OSC:TRIG:SENS?
```

Screen/field equivalent

OSC:TRIG:SENS controls the **Pos/Neg** field on the **Trigger** menu of the SCOPE screen.

:TRIGger:SOURce <string>
:TRIGger:SOURce?

These commands set/query the source of the trigger.

Syntax

```
OSC:TRIG:SOUR 'Internal'
              'Ext(TTL)'
OSC:TRIG:SOUR?
```

Screen/field equivalent

OSC:TRIG:SOUR controls the **Internal** or the **Ext (TTL)** field on the **Trigger** menu of the SCOPE screen.

:TRIGger:TYPE <string>
:TRIGger:TYPE?

These commands set/query how the trigger level is set. 'Auto' triggers a measurement if a triggering signal is not detected within approximately 50 ms of the last trigger. 'Norm' requires a specific triggering signal before triggering.

Syntax

```
OSC:TRIG:TYPE 'Auto'
              'Norm'
OSC:TRIG:TYPE?
```

Screen/field equivalent

OSC:TRIG:TYPE controls the **Auto/Norm** field on the **Trigger** menu of the SCOPE screen.

PROGram subsystem

The Program subsystem provides a set of commands which allow an external controller to generate and control an IBASIC program within the Test Set.

These commands have no equivalent fields or screens.

[:SELected]:DEFine <program data>
[:SELected]:DEFine?

PROG:SEL:DEF downloads an IBASIC program into the Test Set. The query form returns the program. The program must be transferred as IEEE 488.2 Arbitrary Block Program Data. Refer to the IEEE standard 488.2-1987 for detailed information on this data type.

[:SEL] is an optional portion of this command.

<program> is the actual program content

Syntax

```
PROG:SEL:DEF <#0><program><NL><END>

PROG:DEF <#0><program><NL><END>
```

[:SELected]:DELete
[:SELected]:DELete:ALL

These commands delete the IBASIC program currently loaded in the Test Set.

Syntax

```
PROG:SEL:DEL

PROG:DEL !equivalent command

PROG:DEL:ALL !equivalent command
```

[:SELected]:EXECute

This command executes (from an IBASIC controller) an IBASIC command in the Test Set's built-in IBASIC controller.

Syntax

```
PROG:SEL:EXEC

PROG:EXEC !equivalent command
```

[:SELected]:NUMBer <variable>(,<nvalues>)
[:SELected]:NUMBer?

These commands set/query the value of numeric variables or arrays in the IBASIC program currently loaded in the Test Set.

Syntax

```
PROG:SEL:NUMB <variable>,<nvalues>

PROG:NUMB <variable>,<nvalues> !equivalent command
```

[:SELected]:STATe <variable>
[:SELected]:STATe?

These commands set/query (from an external IBASIC controller) the execution state of the IBASIC program currently loaded in the Test Set.

Syntax

```
PROG:SEL:STAT

PROG:STAT !equivalent command
```

[:SELected]:STRing <variable>(,<nvalues>)
[:SELected]:STRing?

These commands set/query the value of string variables or arrays in the IBASIC program currently loaded in the Test Set

Syntax

```
PROG:SEL:STR <variable>,<nvalues>

PROG:STR <variable>,<nvalues> !equivalent command
```

[:SELected]:WAIT
[:SELected]:WAIT?

Syntax

```
PROG:SEL:WAIT? !returns an integer value
```

RAM Usage Information

:SPEC:RAMDISKALLOC?

:RAMDISKALLOC? returns the total RAM disk space that has been used to store programs or test setups in the Test Set.

Note that the number of bytes reported to the remote interface is different than that reported on the screen when using the IB_UTILS program. This is because to calculate kilobytes, the total is divided by 1024 before it is displayed on the screen.

Screen/Field Equivalent

:RAMDISKALLOC? reads the **`RAM Disk Allocations:`** field that can be found in the Test Set's (ROM) IB_UTILS, RAM USAGE program.

:SPEC:RAMFORIBASIC?

:SPEC:TOTALUSERRAM? returns the approximate amount of RAM available in the Test Set for IBASIC programs.

Screen/Field Equivalent

:SPEC:TOTALUSERRAM? reads the **`Approximate RAM Available for IBasic:`** field that can be found in the Test Set's (ROM) IB_UTILS, RAM USAGE program.

:SPEC:SAVEREGALLOC?

:SPEC:SAVEREGALLOC? returns the total RAM space that has been used for save registers in the Test Set.

Screen/Field Equivalent

:SPEC:SAVEREGALLOC? reads the **`Save Register Allocations:`** field that can be found in the Test Set's (ROM) IB_UTILS, RAM USAGE program.

:SPEC:TOTALUSERRAM?

:SPEC:TOTALUSERRAM? returns the total RAM installed in the Test Set.

Screen/Field Equivalent

:SPEC:TOTALUSERRAM? reads the **`Total RAM Installed:`** field that can be found in the Test Set's (ROM) IB_UTILS, RAM USAGE program.

Real Number Setting Syntax

This syntax is for setting real values in commands. It is to be used with commands that require the Real Number Setting Syntax.

An example of a command that requires the Real Number Setting Syntax is the RFANalyzer:FREQuency command. (See “RFANalyzer subsystem” on page 213.)

Syntax

```
:Previous Syntax <real_value>[display unit_of_measure]

:Previous Syntax? !returns the value

:Previous Syntax:DUNits <display unit_of_measure> !sets the units

:Previous Syntax:DUNits? !returns the display units

:Previous Syntax:UNits <HP-IB unit_of_measure>

:Previous Syntax:UNits? !Displays the HP-IB units

:Previous Syntax:INCRement <incr_value>[display unit_of_measure]
     !increments the present value

:Previous Syntax:INCRement? !returns the increment value

:Previous Syntax:INCRement UP|DOWN !increments up or down

:Previous Syntax:STATe 1|ON

:Previous Syntax:STATe 0|OFF

:Previous Syntax:STATe? ! returns 1 or 0

:Previous Syntax:MODe LINear|LOGarithm
    !sets mode of the command

:Previous Syntax:MODe? !returns mode (LIN or LOG)

:Previous Syntax:MULTiply !multiplies current setting by 10

:Previous Syntax:DIVide !divides current setting by 10
```

Example 2-3 Examples

```
RFAN:FREQ 850.35MHz !sets the frequency to 850.35 MHz

RFAN:FREQ? !returns the frequency

RFAN:FREQ:DUNits GHz !changes the units to GigaHertz

RFAN:FREQ:INCR 3.5MHz !increments frequency by 3.5 MHz

RFAN:FREQ:INCR? !returns the increment value

RFAN:FREQ:MULT !multiplies the current frequency by 10
```

```
RFAN:FREQ:MULT !multiplies the current frequency by 10
   !Note that :STAT is not valid for RFAN:FREQ
```

[REGister] subsystem

Register Subsystem contains the save/recall commands used in the Save/Recall registers.

:CLEar <integer or string>

This command clears the register defined by the integer value or string argument.

Syntax

```
:CLE '<string>' !clears the register named 'string'

:CLE '<integer value>' !clears the numbered register

REG:CLE '<string>' !equivalent command
```

Screen/field equivalent

This command corresponds to deleting a save/recall register using the front panel keys. See the *Reference Guide* for more information about using the **Save** and **Recall** keys.

:CLEar:ALL

This command clears all registers.

Syntax

```
:CLE:ALL

REG:CLE:ALL !equivalent command
```

Screen/field equivalent

This command corresponds to the *Clr All* command in the save/recall menu (accessed with the front-panel keys.)

:RECall <integer or string>

This command recalls the register defined by the integer value or string argument

Syntax

```
:REC '<string>' !recalls the register named 'string'
:REC '<integer value>' !recalls the numbered register
REG:REC '<string>' !equivalent command
```

Screen/field equivalent

This command corresponds to recalling a save/recall register using the front panel keys. See the *Reference Guide* for more information about using the **Save** and **Recall** keys.

:RECall:LIST?

This command lists the save/recall registers that have been named.

Syntax

```
REG:REC:LIST?
:REC:LIST? !equivalent command
```

Screen/field equivalent

:REC:LIST? has no equivalent field.

:SAVE <integer or string>

This command saves the register defined by the integer value or string argument.

Syntax

```
:SAVE '<string>' !recalls the register named 'string'
:SAVE '<integer value>' !recalls the numbered register
REG:SAVE '<string>' !equivalent command
```

Screen/field equivalent

This command corresponds to saving a save/recall register using the front panel keys. See the *Reference Guide* for more information about using the **Save** and **Recall** keys.

:SAVE:LIST?

:SAVE:LIST? lists the save/recall registers that have been named.

Syntax

```
REG:SAVE:LIST?
```

```
:SAVE:LIST? !equivalent command
```

Screen/field equivalent

:SAVE:LIST? has no equivalent field.

RFANalyzer subsystem

:ATTenuator <string>
:ATTenuator?

These commands set/query the amount of input attenuation in the path of the selected input port. CONF:ATT:MODE 'Auto' overrides this command.

Syntax

```
RFAN:ATT '0 dB'
         '5 dB'
         '10 dB'
         '15 dB'
         '20 dB'
         '25 dB'
         '30 dB'
         '35 dB'
RFAN:ATT?
```

Screen/field equivalent

RFAN:ATT controls to the lower subfield of the **Input Atten** field on the RF ANALYZER screen.

:ATTenuator:MODE <string>
:ATTenuator:MODE?

These commands set/query the RF autoranging mode.

CONF:ATT:MODE 'Hold' overrides this command.

Syntax

```
RFAN:ATT:MODE 'Auto'
              'Hold'
RFAN:ATT:MODE?
```

Screen/field equivalent

RFAN:ATT:MODE corresponds to the **Auto/Hold** subfield of the **Input Atten** field on the RF ANALYZER screen

:FREQuency <real number>
:FREQuency?

These commands set/query the tune frequency for the RF analyzer. This command requires that the CONF:RFD 'Freq' command is used.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
RFAN:FREQ <real>

RFAN:FREQ?
```

Screen/field equivalent

RFAN:FREQ corresponds to the **Tune Freq** field on the RF ANALYZER screen.

[:FREQuency]:GTIMe <real number>
[:FREQuency]:GTIMe?

These commands set/query the gate time for the RF Frequency counter.

This command utilizes the :DUNits and UNITs commands of the "Real Number Setting Syntax" on page 208.

Syntax

```
RFAN:FREQ:GTIM <real>

RFAN:FREQ:GTIM?
```

Screen/field equivalent

RFAN:FREQ:GTIM controls the **RF Cnt Gate** field on the RF ANALYZER screen.

:IFBW <string>
:IFBW?

These commands set/query the IF filter bandwidth.

Syntax

```
RFAN:IFBW '15 kHz'
          '230 kHz'

RFAN:IFBW?
```

Screen/field equivalent

RFAN:IFBW controls the **IF Filter** field on the RF ANALYZER screen.

:INPut <string>
:INPut?

These commands set/query the RF input port.

Note: Some measurements can only be made on one port.

Syntax

```
RFAN:INP 'RF In'
         'Ant'
RFAN:INP?
```

Screen/field equivalent

RFAN:INP controls the RF **Input Port** field on the RF ANALYZER. This field is also displayed on the SPEC ANL screen.

:PMEasurement:DETector <string>
:PMEasurement:DETector?

These commands set/query the analog TX power measurement method.

Syntax

```
RFAN:PME:DET 'Peak'
             'Sample'
RFAN:PME:DET?
```

Screen/field equivalent

RFAN:PME:DET controls the **TX Pwr Meas** field on the RF ANALYZER screen.

:PMEasurement:ZERO

This command zeroes the TX power measurement.

Syntax

```
RFAN:PME:ZERO
```

Screen/field equivalent

RFAN:PME:ZERO controls the **TX Pwr Zero** field on the RF ANALYZER screen.

:PMEasurement:ZERO:MODE

This command sets/queries the zeroing mode of the TX power measurement. ‘Auto’ periodically zeroes power automatically during operation. ‘Manual’ requires you to use the :PME:ZERO command to zero power.

Syntax

```
RFAN:PME:ZERO:MODE ‘Auto’
                   ‘Manual’

RFAN:PME;ZERO:MODE?
```

Operating Considerations

NOTE When using single triggering mode on the digital analyzer (DGAN:TRIG:MODE ‘single’) the RF analyzer power meter should be set to manual zeroing (RFAN:PME:ZERO:MODE ‘manual’) to ensure power meter zeroing does not interrupt the TDMA measurement results. When the RF analyzer power results are needed, the power meter can be zeroed as needed (RFAN:PME:ZERO).

Screen/field equivalent

RFAN:PME:ZERO:MODE controls the **Auto Zero** field on the RF ANALYZER screen.

:SENSitivity <string>
:SENSitivity?

:SENS sets/queries the RF input sensitivity.

Syntax

```
RFAN:SENS ‘Normal’

          ‘High’

RFAN:SENS?
```

Screen/field equivalent

RFAN:SENS controls the **Sensitivity** field on the RF ANALYZER screen. This field is also displayed on the SPEC ANL screen’s **Auxilliary** menu.

:SQUelch <string>
:SQUelch?

:SQU sets/queries the squelch control setting.

Syntax

```
RFAN:SQU 'Pot'
         'Open'
         'Fixed'
RFAN:SQU?
```

Screen/field equivalent

RFAN:SQU controls the **Squelch** field on the RF ANALYZER screen.

RFGenerator subsystem

The RF generator subsystem controls the functions of the RF GENERATOR screen.

:AMPLitude <real number>

This command sets/queries the amplitude of the RF generator.

This field also controls the RF generator viewed in the spectrum analyzer.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
RFG:AMPL <real>

RFG:AMPL?
```

Screen/field equivalent

RFG:AMPL controls the **Amplitude** field on the RF GENERATOR screen. This field is also displayed on the spectrum analyzer's **RF Gen** menu.

:ATTenuator <string>
:ATTenuator?

These commands set/query the RF generator's attenuator hold function. Attenuator hold prevents the fixed RF output attenuators from switching in and out, eliminating the loss of the output signal as the level is changed.

Syntax

```
RFG:ATT 'On'
        'Off'

RFG:ATT?
```

Screen/field equivalent

RFG:ATT controls the **Atten Hold** field on the RF GENERATOR screen.

:CHANnel <string>
:CHANnel?

These commands set/query the RF channel number. Channel tuning must be enabled (CONF:RFD 'Chan'). You must also choose the correct channel standard (CONF:RFCS <string>).

Syntax

```
RFG:CHAN <integer>

RFG:CHAN?
```

Screen/Field Equivalent

RFG:CHAN controls the upper subfield of the **RF Channel** field on the RF GENERATOR screen when the **RF Display** field on the INSTRUMENT CONFIGURE screen is set to **Chan**.

:FM:COUPling <string>
:FM:COUPling?

These commands set/query the coupling between the MODULATION IN port and the RF generator's FM modulator.

Syntax

```
RFG:FM:COUP  'AC'
             'DC'

RFG:FM:COUP?
```

Screen/field equivalent

RFG:FM:COUP controls the **FM Coupling** field on the RF GENERATOR screen.

:FM:DCZero

This command zeroes any dc bias that exists when the RFG:FM:COUP 'DC' command is used and FM is turned on using the AFG1:DEST 'FM' and AFG1:FM:STAT ON commands (AFG2 could be used instead of AFG1).

Syntax

```
RFG:FM:DCZ
```

Screen/field equivalent

RFG:FM:DCZ controls the **DC FM Zero** field on the RF GENERATOR screen.

:FREQuency <real number>
:FREQuency?

These commands set/query the frequency of the RF generator. The Test Set must first be in frequency tuning mode. (See CONF:RFD 'Freq' on page 99).

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
RFG:FREQ <real number>

RFG:FREQ?
```

Screen/field equivalent

RFG:FREQ controls the **RF Gen Freq** field on the RF GENERATOR screen, when in frequency tuning mode. This field is also displayed on the spectrum analyzer's **RF Gen** menu.

:MODulation:AOUT <string>
:MODulation:AOUT?

These commands set/query the coupling between the demodulated audio and the AUDIO OUT port.

Syntax

```
RFG:MOD:AOUT 'AC'
             'DC'

RFG:MOD:AOUT?
```

Screen/field equivalent

RFG:MOD:AOUT controls the **Audio Out** field on the RF GENERATOR screen.

:MODulation:EXTernal:AM <real number>
:MODulation:EXTernal:AM?

These commands set/query the AM sensitivity of the RF generator when AM is applied through the modulation input port. The modulation input must be set to AM.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
:MOD:EXT:AM <real number>

:MOD:EXT:AM?
```

Screen/field equivalent

RFG:MOD:EXT:AM controls the lower subfield of the **Mod In To** field on the RF GENERATOR screen when **AM (/Vpk)** has been selected in the upper subfield.

:MODulation:EXTernal:DESTination <string>
:MODulation:EXTernal:DESTination?

These commands set/query the type of modulation applied to the RF generator.

This command works with :MOD:EXT:AM and :MOD:EXT:FM to set the level of modulation used.

Syntax

```
:MOD:EXT:DEST 'AM (/Vpk)'
              'FM (/Vpk)'

:MOD:EXT:DEST?
```

Screen/field equivalent

RFG:MOD:DEST:EXT controls the upper subfield of **Mod In To** field on the RF GENERATOR screen.

:MODulation:EXTernal:FM <real number>
:MODulation:EXTernal:FM?

These commands set/query the FM deviation of the RF generator when FM is applied through the modulation input port. The modulation input must be set to FM.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
:MOD:EXT:FM <real number>

:MOD:EXT:FM?
```

Screen/field equivalent

RFG:MOD:EXT:FM controls the lower subfield of the **Mod In To** field on the RF GENERATOR screen when **FM (/Vpk)** is selected in the upper subfield.

:OUTPut <string>
:OUTPut?

These commands set/query the RF output port.

Syntax

```
RFG:OUTP 'RF Out'
         'Dupl'

RFG:OUTP?
```

Screen/field equivalent

RFG:OUTP controls the **Output Port** field on the RF GENERATOR screen. This field is also displayed on the spectrum analyzer's **RF Gen** menu when the spectrum analyzer is in fixed mode.

SANalyzer subsystem

:ATTenuator <string>
:ATTenuator?

These commands set/query the attenuator setting for the input port.

Syntax

```
SAN:ATT '0 dB'
    '5 dB'
         '10 dB'
         '15 dB'
         '20 dB'
         '25 dB'
         '30 dB'
         '35 dB'
SAN:ATT?
```

Screen/field equivalent

SAN:ATT controls the lower subfield of the **Input Atten** field on the SPEC ANL screen's **Auxilliary** menu.

:ATTenuator:MODE <string>
:ATTenuator:MODE?

These commands set/query the mode of the attenuator.

Syntax

```
SAN:ATT:MODE 'Auto'
     'Hold'
SAN:ATT:MODE?
```

Screen/field equivalent

SAN:ATT:MODE controls the **Auto/Hold** subfield of the **Input Atten** field on the SPEC ANL screen's **Auxilliary** menu.

:CFRequency <real number>
:CFRequency?

These commands set/query the center frequency of the spectrum analyzer's display.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
SAN:CFR <real number>

SAN:CFR?
```

Screen/field equivalent

SAN:CFR controls the **Center Freq** field on the SPEC ANL screen's **Main** menu.

:CONTrol <string>
:CONTrol?

These commands set/query the **Controls** menu for the spectrum analyzer. You can choose controls for the main, RF generator, marker, trigger, mask, or auxilliary functions.

Syntax

```
SAN:CONT 'Main'
         'RF Gen'
         'Marker'
         'Auxiliary'
         'Mask'

SAN:CONT?
```

Screen/field equivalent

SAN:CONT controls the **Controls** field on the SPEC ANL screen.

:DISPlay:SCALe <string>
:DISPlay:SCALe?

These commands set/query the vertical scale of the spectrum analyzer display.

Syntax

```
SAN:DISP:SCAL '1 dB/div'
      '2 dB/div'
      '10 dB/div'
SAN:DISP:SCAL?
```

Screen/field equivalent

SAN:DISP:SCAL controls the lower subfield of the **Sensitivity** field on the SPEC ANL screen's **Auxilliary** menu.

:INPut <string>
:INPut?

These commands set/query the input to the spectrum analyzer.

Syntax

```
SAN:INP 'RF In'
          'Ant'
SAN:INP?
```

Screen/field equivalent

SAN:INP controls the **RF In/Ant** field on **Main** menu of the SPEC ANL screen.

:MARKer:DELTa:CFRequency

This command sets the delta marker at the center frequency of the spectrum analyzer's measurement trace.

Syntax

```
SAN:MARK:DELT:CFR
```

Screen/field equivalent

SAN:MARK:DELT:CFR controls the **Marker To, Center Freq** field on the **Marker** menu of the SPEC ANL screen when the **Norm/Delta** field is set to **Delta**.

:MARKer:DELTa:NPEak

This command sets the delta marker at the next peak of the spectrum analyzer display.

Syntax

```
SAN:MARK:DELT:NPE
```

Screen/field equivalent

SAN:MARK:DELT:NPE controls the **Marker To, Next Peak** field on the **Marker** menu of the SPEC ANL screen when the **Norm/Delta** field is set to **Delta**.

:MARKer:DELTa:NPLevel <real number>
:MARKer:DELTa:NPLevel?

These commands set/query the level of the next peak signal at the delta marker.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
SAN:MARK:DELT:NPL <real number>

SAN:MARK:DELT:NPL?
```

Screen/field equivalent

SAN:MARK:DELT:NPL controls the **Level** field on the SPEC ANL screen when the **Norm/Delta** field is set to **Delta**.

:MARKer:DELTa:PEAK

This command moves the delta marker to the highest peak of the signals on the spectrum analyzer display trace.

Syntax

```
SAN:MARK:DELT:PEAK
```

Screen/field equivalent

SAN:MARK:DELT:PEAK controls the **Marker To**, **Peak** field on the **Marker** menu of the SPEC ANL screen when the **Norm/Delta** field is set to **Delta**.

:MARKer:DELTa:POSition <real number>
:MARKer:DELTa:POSition?

These commands set/query the position of the delta marker on the spectrum analyzer.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
SAN:MARK:DELT:POS <real number>

SAN:MARK:DELT:POS?
```

Screen/field equivalent

SAN:MARK:DELT:POS controls the **Position** field on the **Marker** menu of the SPEC ANL screen when the **Norm/Delta** field is set to **Delta**.

:MARKer:DELTa:RLEVel

:MARK:DELT:RLEV moves the signal at the delta marker to the reference level position of the spectrum analyzer.

Syntax

```
SAN:MARK:DELT:RLEV
```

Screen/field equivalent

SAN:MARK:DELT:RLEV controls the **Marker To**, **Ref Level** field on the **Marker** menu of the SPEC ANL screen when the **Norm/Delta** field is set to **Delta**.

:MARKer:MODE <string>
:MARKer:MODE?

These commands set/query the whether the marker is in normal mode or delta mode.

In normal mode the spectrum analyzer measures the frequency and level at the marker's position. In delta mode the spectrum analyzer displays a second marker and measures the difference (frequency and level) from the "normal" marker position. The marker is positioned using the SAN:MARK:DELT commands on page 225 through page 227, and the results are read with the MEAS:SAN:MARK:DELT commands on page page 186.

Syntax

```
SAN:MARK:MODE 'Norm'
              'Delta'
SAN:MARK:MODE?
```

Screen/field equivalent

SAN:MARK:MODE controls the **Norm/Delta** field on the **Marker** menu of the SPEC ANL screen.

:MARKer[:NORMal]:CFRequency

This command moves the marker to the center frequency of the spectrum analyzer's measurement trace.

Syntax

```
SAN:MARK:NORM:CFR
```

Screen/field equivalent

SAN:MARK:NORM:CFR controls the **Marker To, Center Freq** field on the **Marker** menu of the SPEC ANL screen when **Norm/Delta** field is set to **Norm** on the **Marker** controls menu.

:MARKer[:NORMal]:NPEak

This command moves the marker to the next peak of the spectrum analyzer's measurement trace.

Syntax

```
SAN:MARK:NORM:NPE
```

Screen/field equivalent

SAN:MARK:NORM:NPE controls the **Marker To, Next Peak** field on the **Marker** menu of the SPEC ANL screen when **Norm/Delta** field is set to **Norm** on the **Marker** controls menu.

:MARKer[:NORMal]:NPLevel <real number>
:MARKer[:NORMal]:NPLevel?

These commands set/query the level of the next peak signal.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
SAN:MARK:NORM:NPL <real number>
```

```
SAN:MARK:NORM:NPL?
```

Screen/field equivalent

SAN:MARK:NORM:NPL controls the **Level** field on the SPEC ANL screen when **Norm/Delta** field is set to **Norm** on the **Marker** controls menu.

:MARKer[:NORMal]:PEAK

This command moves the marker to the highest peak of the signals on the spectrum analyzer display trace.

Syntax

```
SAN:MARK:NORM:PEAK
```

Screen/field equivalent

SAN:MARK:NORM:PEAK controls the **Marker To**, **Peak** field on the **Marker** menu of the SPEC ANL screen when **Norm/Delta** field is set to **Norm** on the **Marker** controls menu.

:MARKer[:NORMal]:POSition <real number>
:MARKer[:NORMal]:POSition?

These commands set/query the position of the marker on the spectrum analyzer.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
SAN:MARK:NORM:POS <real number>

SAN:MARK:NORM:POS?
```

Screen/field equivalent

SAN:MARK:NORM:POS controls the **Position** field on the **Marker** menu of the SPEC ANL screen when **Norm/Delta** field is set to **Norm** on the **Marker** controls menu.

:MARKer:REFmode
:MARKer:REFmode?

These commands set/query the spectrum analyzer's reference marker mode when using the delta markers.

When the **Ref Mrkr** field is set to **Hold**, the reference marker is frozen at its current position (frequency and level) regardless of changes in the signal level or center frequency.

When you switch from **Hold** to **Norm**, the reference marker will stay at its current horizontal setting (frequency), but will track the level of the incoming signal.

Syntax

```
SAN:MARK:REF 'Norm'
             'Hold'

SAN:MARK:REF?
```

Screen/field equivalent

SAN:MARK:REF controls the **Ref Mrkr** field on the **Marker** menu of the SPEC ANL.

:MASK:BEEP
:MASK:BEEP?

This command turns the failure indicator beeper off or on.

Syntax

```
SAN:MASK:BEEP 'On'
              'Off'
SAN:MASK:BEEP?
```

Screen/field equivalent

SAN:MASK:BEEP controls the **Mask Beep** field on the **Mask** menu of the SPEC ANL screen.

:MASK:DISPlay
:MASK:DISPlay?

This command sets/queries which masks will be displayed: upper, lower, both, or none (Off).

Syntax

```
SAN:MASK:DISP 'UpperOnly'
              'LowerOnly'
              'Both'
              'Off'

SAN:MASK:DISP?
```

Screen/field equivalent

SAN:MASK:DISP controls the **Display** field on the **Mask** menu of the SPEC ANL screen.

:MASK:FIXed:LOWer:POINts:NUMBer
:MASK:FIXed:LOWer:POINts:NUMBer?

This command sets/queries the number of points in the lower spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:FIX:LOW:POIN:NUMB <integer 1-15>
SAN:MASK:FIX:LOW:POIN:NUMB?
```

Screen/field equivalent

SAN:MASK:FIX:LOW:POIN:NUMB controls the **#Pts** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:LOWer:POINts:EDIT

This command selects/queries the point number to edit on the lower spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:FIX:LOW:POIN:EDIT <integer 1-15>
SAN:MASK:FIX:LOW:POIN:EDIT?
```

Screen/field equivalent

SAN:MASK:FIX:LOW:POIN:EDIT controls the **EditPt** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:LOWer:POINts:LEVEL1 (through LEVEL15)
:MASK:FIXed:LOWer:POINts:LEVEL1? (through LEVEL15)

These commands set/query the level of the defined points on the lower spectrum analyzer mask.

Syntax

To define the levels in a four-point mask:

```
SAN:MASK:FIX:LOW:POIN:LEVEL1 <real number>
SAN:MASK:FIX:LOW:POIN:LEVEL2 <real number>
SAN MASK:FIX:LOW:POIN:LEVEL3 <real number>
SAN:MASK:FIX:LOW:POIN:LEVEL4 <real number>
```

```
SAN:MASK:FIX:LOW:POIN:LEVEL1?
```

Screen/field equivalent

SAN:MASK:FIX:LOW:POIN:LEVEL1 controls the **Level** field on the **Mask** menu of the SPEC ANL screen when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:LOWer:POINts:FREQuency1 (through FREQ15)
:MASK:FIXed:LOWer:POINts:FREQuency1? (through FREQ15)

These commands set/query the frequency (Hz) of the defined points on the lower spectrum analyzer mask.

Syntax

To define the frequencies in a four-point mask:

```
SAN:MASK:FIX:LOW:POIN:FREQ1 <real number>
SAN:MASK:FIX:LOW:POIN:FREQ2 <real number>
SAN MASK:FIX:LOW:POIN:FREQ3 <real number>
SAN:MASK:FIX:LOW:POIN:FREQ4 <real number>
```

```
SAN:MASK:FIX:LOW:POIN:FREQ1?
```

Screen/field equivalent

SAN:MASK:FIX:LOW:POIN:FREQ1 controls the **Freq** field on the **Mask** menu of the SPEC ANL when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:UPPer:POINts:NUMBer
:MASK:FIXed:UPPer:POINts:NUMBer?

This command sets/queries the number of points in the upper spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:FIX:UPP:POIN:NUMB <integer 1-15>
SAN:MASK:FIX:UPP:POIN:NUMB?
```

Screen/field equivalent

SAN:MASK:FIX:UPP:POIN:NUMB controls the **#Pts** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:UPPer:POINts:EDIT

This command selects/queries the point number to edit on the upper spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:FIX:UPP:POIN:EDIT <integer 1-15>
SAN:MASK:FIX:UPP:POIN:EDIT?
```

Screen/field equivalent

SAN:MASK:FIX:UPP:POIN:EDIT controls the **EditPt** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:UPPer:POINts:LEVEL1 (through LEVEL15)
:MASK:FIXed:UPPer:POINts:LEVEL1? (through LEVEL15)

These commands set/query the level of the defined points on the upper spectrum analyzer mask.

Syntax

To define the levels in a four-point mask:

```
SAN:MASK:FIX:UPP:POIN:LEVEL1 <real number>
SAN:MASK:FIX:UPP:POIN:LEVEL2 <real number>
SAN MASK:FIX:UPP:POIN:LEVEL3 <real number>
SAN:MASK:FIX:UPP:POIN:LEVEL4 <real number>

SAN:MASK:FIX:UPP:POIN:LEVEL1?
```

Screen/field equivalent

SAN:MASK:FIX:UPP:POIN:LEVEL1 controls the **Level** field on the **Mask** menu of the SPEC ANL screen when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Fix**.

:MASK:FIXed:UPPer:POINts:FREQuency1 (through FREQ15)
:MASK:FIXed:UPPer:POINts:FREQuency1? (through FREQ15)

These commands set/query the frequency (Hz) of the defined points on the upper spectrum analyzer mask.

Syntax

To define the frequencies in a four-point mask:

```
SAN:MASK:FIX:UPP:POIN:FREQ1 <real number>
SAN:MASK:FIX:UPP:POIN:FREQ2 <real number>
SAN MASK:FIX:UPP:POIN:FREQ3 <real number>
SAN:MASK:FIX:UPP:POIN:FREQ4 <real number>

SAN:MASK:FIX:UPP:POIN:FREQ1?
```

Screen/field equivalent

SAN:MASK:FIX:UPP:POIN:FREQ1 controls the **Freq** field on the **Mask** menu of the SPEC ANL when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Fix**.

:MASK:RELative:LOWer:POINts:NUMBer
:MASK:RELative:LOWer:POINts:NUMBer?

This command sets/queries the number of points in the lower spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:REL:LOW:POIN:NUMB <integer 1-15>
SAN:MASK:REL:LOW:POIN:NUMB?
```

Screen/field equivalent

SAN:MASK:REL:LOW:POIN:NUMB controls the **#Pts** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:LOWer:POINts:EDIT

This command selects/queries the point number to edit on the lower spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:REL:LOW:POIN:EDIT <integer 1-15>
SAN:MASK:REL:LOW:POIN:EDIT?
```

Screen/field equivalent

SAN:MASK:REL:LOW:POIN:EDIT controls the **EditPt** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:LOWer:POINts:LEVEL1 (through LEVEL15)
:MASK:RELative:LOWer:POINts:LEVEL1? (through LEVEL15)

These commands set/query the level of the defined points on the lower spectrum analyzer mask (relative to the top line of the display (**Ref Level**)).

Syntax

To define the levels in a four-point mask:

```
SAN:MASK:REL:LOW:POIN:LEVEL1 <real number>
SAN:MASK:REL:LOW:POIN:LEVEL2 <real number>
SAN MASK:REL:LOW:POIN:LEVEL3 <real number>
SAN:MASK:REL:LOW:POIN:LEVEL4 <real number>

SAN:MASK:REL:LOW:POIN:LEVEL1?
```

Screen/field equivalent

SAN:MASK:REL:LOW:POIN:LEVEL1 controls the **Level Ofs** field on the **Mask** menu of the SPEC ANL screen when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:LOWer:POINts:FREQuency1 (through FREQ15)
:MASK:RELative:LOWer:POINts:FREQuency1? (through FREQ15)

These commands set/query the frequency (Hz) of the defined points on the lower spectrum analyzer mask (relative to the center line of the display).

Syntax

To define the frequencies in a four-point mask:

```
SAN:MASK:REL:LOW:POIN:FREQ1 <real number>
SAN:MASK:REL:LOW:POIN:FREQ2 <real number>
SAN MASK:REL:LOW:POIN:FREQ3 <real number>
SAN:MASK:REL:LOW:POIN:FREQ4 <real number>

SAN:MASK:REL:LOW:POIN:FREQ1?
```

Screen/field equivalent

SAN:MASK:REL:LOW:POIN:FREQ1 controls the **Freq Ofs** field on the **Mask** menu of the SPEC ANL when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Lower**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:UPPer:POINts:NUMBer
:MASK:RELative:UPPer:POINts:NUMBer?

This command sets/queries the number of points in the upper spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:REL:UPP:POIN:NUMB <integer 1-15>
SAN:MASK:REL:UPP:POIN:NUMB?
```

Screen/field equivalent

SAN:MASK:REL:UPP:POIN:NUMB controls the **#Pts** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:UPPer:POINts:EDIT

This command selects/queries the point number to edit on the upper spectrum analyzer mask. The maximum number is 15.

Syntax

```
SAN:MASK:REL:UPP:POIN:EDIT <integer 1-15>
SAN:MASK:REL:UPP:POIN:EDIT?
```

Screen/field equivalent

SAN:MASK:REL:UPP:POIN:EDIT controls the **EditPt** field on the **Mask** menu of the SPEC ANL screen when the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:UPPer:POINts:LEVEL1 (through LEVEL15)
:MASK:RELative:UPPer:POINts:LEVEL1? (through LEVEL15)

These commands set/query the level of the defined points on the upper spectrum analyzer mask.

Syntax

To define the levels in a four-point mask:

```
SAN:MASK:REL:UPP:POIN:LEVEL1 <real number>
SAN:MASK:REL:UPP:POIN:LEVEL2 <real number>
SAN MASK:REL:UPP:POIN:LEVEL3 <real number>
SAN:MASK:REL:UPP:POIN:LEVEL4 <real number>

SAN:MASK:REL:UPP:POIN:LEVEL1?
```

Screen/field equivalent

SAN:MASK:REL:UPP:POIN:LEVEL1 controls the **Level Ofs** field on the **Mask** menu of the SPEC ANL screen when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Rel**.

:MASK:RELative:UPPer:POINts:FREQuency1 (through FREQ15)
:MASK:RELative:UPPer:POINts:FREQuency1? (through FREQ15)

These commands set/query the frequency (Hz) of the defined points on the upper spectrum analyzer mask.

Syntax

To define the frequencies in a four-point mask:

```
SAN:MASK:REL:UPP:POIN:FREQ1 <real number>
SAN:MASK:REL:UPP:POIN:FREQ2 <real number>
SAN MASK:REL:UPP:POIN:FREQ3 <real number>
SAN:MASK:REL:UPP:POIN:FREQ4 <real number>

SAN:MASK:REL:UPP:POIN:FREQ1?
```

Screen/field equivalent

SAN:MASK:REL:UPP:POIN:FREQ1 controls the **Freq Ofs** field on the **Mask** menu of the SPEC ANL when the **EditPt** field is set to **1**, the **Edit Mask** field is set to **Upper**, and the **Mask Type** field is set to **Rel**.

:MASK:TYPE
:MASK:TYPE?

This command selects/queries the type of mask, fixed or relative. 'Fixed' sets the mask in absolute frequency and level points. 'Relative' sets the mask relative to the center frequency and reference level set with the SAN:CFR and SAN:RLEV commands. If the center frequency is changed after setting the mask, the mask remains in the same position on the screen, and measurements are now relative to the new center frequency and reference level.

Syntax

```
SAN:MASK:TYPE 'Fix'
              'Rel'
SAN:MASK:TYPE?
```

Screen/field equivalent

SAN:MASK:DISP controls the **Mask Type** field on the **Mask** menu of the SPEC ANL screen.

:RFGenerator <string>
:RFGenerator?

This command selects between the fixed frequency generator and the tracking generator. The query form returns the mode setting of the generator.

Syntax

```
SAN:RFG 'Track'
        'Fixed'
SAN:RFG?
```

Screen/field equivalent

SAN:RFG controls the **Track/Fixed** field on the **RF Gen** menu of the SPEC ANL screen.

:RLEVel <real number>
:RLEVel?

These commands set/query the reference level of the spectrum analyzer.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
SAN:RLEV <real number>

SAN:RLEV?
```

Screen/field equivalent

SAN:RLEV controls the **Ref Level** field on **Main** menu of the SPEC ANL screen.

:SPAN <real number>
:SPAN?

These commands set/query the span of the spectrum analyzer display.

This command utilizes the "Real Number Setting Syntax" on page 208, but does not use the :STATe command.

Syntax

```
SAN:SPAN <real number>

SAN:SPAN?
```

Screen/field equivalent

SAN:SPAN controls the **Span** field on the **Main** menu SPEC ANL screen.

:TGENerator:AMPLitude <real number>
:TGENerator:AMPLitude?

These commands set/query the amplitude of the tracking generator. To select the tracking generator use the SAN:RFG 'Track' command.

This command utilizes the "Real Number Setting Syntax" on page 208.

Syntax

```
SAN:TGEN:AMPL <real>

SAN:TGEN:AMPL?
```

Screen/field equivalent

SAN:TGEN:AMPL controls the **Amplitude** field on the **RF Gen** menu of the SPEC ANL screen. The **Track/Fixed** field must be set to **Track**.

:TGENerator:DESTination <string>
:TGENerator:DESTination?

These commands set/query the output port for the tracking generator. To select the tracking generator use the SAN:RFG 'Track' command.

Syntax

```
SAN:TGEN:DEST 'RF Out'
       'Dupl'

SAN:TGEN:DEST?
```

Screen/field equivalent

SAN:TGEN:DEST controls the RF Out/Dupl subfield of the **Port/Sweep** field on the **RF Gen** menu of the SPEC ANL screen. The **Track/Fixed** field must be set to **Track**.

:TGENerator:OFRequency <real number>
:TGENerator:OFRequency?

These commands set/query the offset frequency of the tracking generator. To select the tracking generator use the SAN:RFG 'Track' command.

This command utilizes the "Real Number Setting Syntax" on page 208 , but does not use the :STATe command.

Syntax

```
SAN:TGEN:OFR <real number>

SAN:TGEN:OFR?
```

Screen/field equivalent

SAN:TGEN:OFR controls the **Offset Freq** field on the **RF Gen** menu of the SPEC ANL screen. The **Track/Fixed** field must be set to **Track**.

:TGENerator:SWEep <string>
:TGENerator:SWEep?

These commands set/query the sweep type of the tracking generator. To select the tracking generator use the SAN:RFG 'Track' command. 'Norm' specifies a sweep from low to high frequency. 'Invert' specifies a sweep from high to low frequency.

Syntax

```
SAN:TGEN:SWE 'Norm'

     'Invert'

SAN:TGEN:SWE?
```

Screen/field equivalent

SAN:TGEN:SWE controls the **Norm/Invert** subfield of the **Port/Sweep** field on the **RF Gen** menu of the SPEC ANL screen. The **Track/Fixed** field must be set to **Track**.

:TRACe:MHOLd <string>
:TRACe:MHOLd?

These commands set/query the type of averaging used in the spectrum analyzer's display.

Syntax

```
SAN:TRAC:MHOL 'No Pk/Avg'
              'Pk Hold'
              'Avg 1'
              'Avg 2'
              'Avg 3'
              'Avg 4'
              'Avg 5'
              'Avg 10'
              'Avg 20'
              'Avg 50'
              'Avg 100'
              'Off'
SAN:TRAC:MHOL?
```

Screen/field equivalent

SAN:TRAC:MHOL controls averaging field on the **Auxilliary** menu of the SPEC ANL screen. This field is located under the menu control field.

:TRACe:NORMalize <string>
:TRACe:NORMalize?

These commands set/query the type of trace display. ‘A Only’ provides a continuously updated display (normal operation). ‘A-B’ displays the difference between the trace saved using SAN:TRAC:SAVE and the currently displayed trace.

Syntax

```
SAN:TRAC:NORM ‘A Only’
      ‘A-B’
SAN:TRAC:NORM?
```

Screen/field equivalent

SAN:TRAC:NORM controls the **A Only/A-B** subfield of the **Normalize** field on the tracking generator of the SPEC ANL screen’s **Auxilliary** menu.

:TRACe:SAVE

This command stores the trace that is currently displayed on the spectrum analyzer display.

Syntax

```
SAN:TRAC:SAVE
```

Screen/field equivalent

SAN:TRAC:SAVE controls the **Save B** subfield of the **Normalize** field on the SPEC ANL screen’s **Auxilliary** menu.

STATus

The STATus subsystem reports many of the modes of the Test Set, including the states. These commands do not correspond to fields in specific screens. For detailed information about status registers, see "Status Reporting" in the Advanced Operations chapter of the Test Set's *Programmer's Guide*.

:CALibration:CONDition?

This command queries the state of the calibration.

This query returns an integer value.

Syntax

```
STAT:CAL:COND?
```

:CALibration:ENABle
:CALibration:ENABle?

This command enables the calibration.

This query returns an integer value.

Syntax

```
STAT:CAL:ENAB
```

```
STAT:CAL:ENAB
```

:CALibration[:EVENt]?

This command queries the state of the event.

Syntax

```
STAT:CAL?
```

:CALibration[:EVENt]:NTRansition
:CALibration[:EVENt]:NTRansition?

These commands set/query the state of the negative transition of the calibration.

This query returns an integer value.

Syntax

```
STAT:CAL:NTR
```

```
STAT:CAL:NTR?
```

:CALibration[:EVENt]:PTRansition
:CALibration[:EVENt]:PTRansition?

These commands set/query the state of the positive transition of the calibration.

This query returns an integer value.

Syntax

```
STAT:CAL:PTR
STAT:CAL:PTR?
```

:COMMunicate:CONDition?

This query returns an integer value.

Syntax

```
STAT:COMM:COND?
```

:COMMunicate:ENABle
:COMMunicate:ENABle?

This query returns an integer value.

Syntax

```
STAT:COMM:ENAB
STAT:COMM:ENAB?
```

:COMMunicate[:EVENt]:NTRansition
:COMMunicate[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:COMM:NTR
STAT:COMM:NTR?
```

:COMMunicate[:EVENt]:PTRansition
:COMMunicate[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:COMM:PTR
STAT:COMM:PTR?
```

:HARD1:CONDition?

Status reporting for hardware.

This query returns an integer value.

Syntax

```
STATHARD1:COND?
```

:HARD1:ENABle
:HARD1:ENABle?

This query returns an integer value.

Syntax

```
STAT:HARD1:ENAB
```

```
STAT:HARD1:ENAB?
```

:HARD1[:EVENt]:NTRansition
:HARD1[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:HARD1:NTR
```

```
STAT:HARD1:NTR?
```

:HARD1[:EVENt]:PTRansition
:HARD1[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:HARD1:PTR
```

```
STAT:HARD1:PTR?
```

:HARD2:CONDition?

This query returns an integer value.

Syntax

```
STAT:HARD2:COND
```

```
STAT:HARD2:COND?
```

:HARD2:ENABle
:HARD2:ENABle?

This query returns an integer value.

Syntax

```
STAT:HARD2:ENAB
STAT:HARD2:ENAB?
```

:HARD2[:EVENt]:NTRansition
:HARD2[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:HARD2:NTR
STAT:HARD2:NTR?
```

:HARD2[:EVENt]:PTRansition
:HARD2[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:HARD2:PTR
STAT:HARD2:PTR?
```

:IBASic:CONDition?

This query returns an integer value.

Syntax

```
STAT:IBAS:COND?
```

:IBASic:ENABle
:IBASic:ENABle?

This query returns an integer value.

Syntax

```
STAT:IBAS:ENAB
STAT:IBAS:ENAB?
```

:IBASic[:EVENt]:NTRansition
:IBASic[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:IBAS:NTR
STAT:IBAS:NTR?
```

:IBASic[:EVENt]:PTRansition
:IBASic[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:IBAS:PTR
STAT:IBAS:PTR?
```

:MEASuring:CONDition?

This query returns an integer value.

Syntax

```
STAT:MEAS:COND?
```

:MEASuring:ENABle
:MEASuring:ENABle?

This query returns an integer value.

Syntax

```
STAT:MEAS:ENAB
STAT:MEAS:ENAB?
```

:MEASuring[:EVENt]:NTRansition
:MEASuring[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:MEAS:NTR
STAT:MEAS:NTR?
```

:MEASuring[:EVENt]:PTRansition
:MEASuring[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:MEAS:PTR
STAT:MEAS:PTR?
```

:OPERation:CONDition?

This query returns an integer value.

Syntax

```
STAT:OPER:COND?
```

:OPERation:ENABle
:OPERation:ENABle?

This query returns an integer value.

Syntax

```
STAT:OPER:ENAB
STAT:OPER:ENAB?
```

:OPERation[:EVENt]:NTRansition
:OPERation[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:OPER:NTR
STAT:OPER:NTR?
```

:OPERation[:EVENt]:PTRansition
:OPERation[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:OPER:PTR
STAT:OPER:PTR?
```

:OPERation:CALibrating:CONDition?

This query returns an integer value.

Syntax

```
STAT:OPER:CAL:COND?
```

:OPERation:CALibrating:ENABle
:OPERation:CALibrating:ENABle?

This query returns an integer value.

Syntax

```
STAT:OPER:CAL:ENAB
```

```
STAT:OPER:CAL:ENAB
```

:OPERation:CALibrating[:EVENt]:NTRansition
:OPERation:CALibrating[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:OPER:CAL:NTR
```

```
STAT:OPER:CAL:NTR?
```

:OPERation:CALibrating[:EVENt]:PTRansition
:OPERation:CALibrating[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:OPER:CAL:PTR
```

```
STAT:OPER:CAL:PTR?
```

:PRESet

This command presets the Test Set.

Syntax

```
STAT:PRES
```

:QUEStionable:CONDition?

This query returns an integer value.

Syntax

```
STAT:QUES:COND?
```

:QUEStionable:ENABle
:QUEStionable:ENABle?

This query returns an integer value.

Syntax

```
STAT:QUES:ENAB
STAT:QUES:ENAB?
```

:QUEStionable[:EVENt]:NTRansition
:QUEStionable[:EVENt]:NTRansition?

This query returns an integer value.

Syntax

```
STAT:QUES:NTR
STAT:QUES:NTR?
```

:QUEStionable[:EVENt]:PTRansition
:QUEStionable[:EVENt]:PTRansition?

This query returns an integer value.

Syntax

```
STAT:QUES:PTR
STAT:QUES:PTR?
```

SYSTem

[:ERRor?]

This command returns an integer followed by quoted string.

Syntax

```
SYST:ERR?
```

TRIGger subsystem

The Trigger subsystem contains commands for triggering measurements. There are no screen/field equivalents for the trigger subsystem commands.

:ABORt

This command ends a measurement cycle in progress.

Syntax

```
TRIG:ABOR
```

[:IMMediate]

This command triggers all selected measurements.

Syntax

```
TRIG
```

:MODE:RETRigger
:MODE:RETRigger?

These commands set/query the retriggering setting.

Syntax

```
TRIG:MODE:RETR REPetitive
TRIG:MODE:RETR SINGle
TRIG:MODE:RETR?
```

:MODE:SETTling
:MODE:SETTling?

These commands set/query the transient settling function.

Syntax

```
TRIG:MODE:MODE:SETT FAST
TRIG:MODE:MODE:SETT FULL
TRIG:MODE:MODE:SETT?
```

3 Programming Examples

Reading TDMA Test Results

TDMA test results are returned using two commands. :MEAS:DGAN:LAB? returns the names of the measurements in a comma-separated string. :MEAS:DGAN:VAL? returns the measured values for each of the labeled measurements in a comma-separated string. The FNSearch and FNRead functions are used to parse these two strings into a more readable format (such as Error Vector Mag = <value>).

The following program example performs an EVM Base measurement on the Test Set's digital generator.

After connecting the RF IN/OUT port to the DUPLEX OUT port and pressing 'Continue' on your controller, the program continues until all the measurements displayed on the TDMA TEST screen are read back into your controller.

This program was written to run using the Test Set's internal IBASIC controller. To run this program on an external controller, change the bus select code in line 10 to match you controller (usually 7).

```
10    Bus=8  !Define the Bus Select Code (8=Test Set's internal controller).
20    Dut=100*Bus+14           !Define the HP-IB address of the Test Set.
30    CLEAR SCREEN
40    Print "Connect the RF IN/OUT port to the DUPLEX OUT port."
50    Print "Press 'Continue' to perform the test."
60    PAUSE
70    CLEAR SCREEN
80    OUTPUT Dut;"*RST"                              !PRESET the Test System.
90    OUTPUT Dut;"DISP RFG"                 !Display the RF Generator screen.
100   OUTPUT Dut;"RFG:FREQ 850 MHZ"               !Create an 850 MHz carrier.
110   OUTPUT Dut;"RFG:OUTP 'DUPL'"    !Send carrier out the DUPLEX OUT port.
120   OUTPUT Dut;"RFG:AMPL 5 DBM"                !Set the carrier amplitude.
130   OUTPUT Dut;"AFG1:FM:STAT OFF"  !Turn the default 3 kHz mod signal off.
140   OUTPUT Dut;"DISP RFAN"                 !Display the RF ANALYZER screen.
150   OUTPUT Dut;"RFAN:TMODE 'MANUAL'" !Set RF Analyzer Tune Mode to Manual.
160   OUTPUT Dut;"RFAN:FREQ 850 MHZ"         !Set Tune Frequency to 850 MHz.
170   OUTPUT Dut;"RFAN:INP 'RF IN'"            !Set the Input Port to RF In.
180   OUTPUT Dut;"RFAN:ATT:MODE 'HOLD'"    !Set Input Atten ranging to Hold.
190   OUTPUT Dut;"TRIG:MODE:RETR SING" !Set trigger to make one measurement.
200   OUTPUT Dut;"DISP TDMA"        !Display the TDMA TEST screen.
210   OUTPUT Dut;"DGCommon:SETup 'EVM Base'" !Select the EVM Base Std Setup.
220   OUTPUT Dut;"DGG:SEND"  !Modulate carrier with Digital Gen's TDMA data.
230   OUTPUT Dut;"TRIG"                              !Trigger the measurement.
240    DIM Values(30),Label$(30)[20]     ! Dimension measurement arrays
250    ON TIMEOUT Bus,10 GOTO Timeout    ! Set a 10 second timeout in case a
260              ! valid measurement cannot be made and the bus gets 'hung'.
270    OUTPUT Dut;"MEAS:DGAN:VAL?"       ! Query measurement values.
280    Num_values=FNRead(Dut,Values(*))  ! Enter measurement values into the
290                   ! Values array, and read the number of values returned.
```

```
300    FOR I=1 TO Num_values            ! Define number of measurement labels.
310    OUTPUT Dut;"MEAS:DGAN:LAB? ";I-1  ! Query measurement labels.
320    ENTER Dut;Label$(I)    ! Enter returned labels in the 'Label' array.
330    NEXT I
340    OFF TIMEOUT Bus                   ! Disable timeout after measurent
350    !

360    FOR I=1 TO Num_values             ! Echo the results sent to
370    PRINT Label$(I),Values(I)         ! the screen on the controller.
380    NEXT I
390    PRINT
400    !
410    ! Print selected results.  The FNSearch function is used to
420    ! return the index into the previously read Values array to
430    ! to find the values to be printed.  The following example
440    ! shows that the entire label doesn't need to be passed in as a
450    ! search string, and that the searches allow the program to
460    ! print out the values in any order.  If a label is not found
470    ! then the value MAXREAL is returned.
480    !
490    Values(0)=MAXREAL              ! Error indicator, if string not found
500  PRINT "Error Vector Mag = ";Values(FNSearch(Num_values,Label$(*),"EVM"))
510  PRINT "Origin Offset = ";Values(FNSearch(Num_values,Label$(*),"Org
Ofs"))
520  PRINT "Status = ";Values(FNSearch(Num_values,Label$(*),"Status"))
530 PRINT "Error Example= ";Values(FNSearch(Num_values,Label$(*),"No
String"))
540    !
550    STOP
560    !
570 Timeout: ! Specify what to do if a measurement timeout occurs.
580    PRINT
590    PRINT "Measurement timed out."
600    CLEAR Bus
610    STOP
620    !
630    END
640    !
650    ! Search elements 1 through Array_size (inclusive) of String_array$
660    ! for an element that includes Search_string$.  Return the index
670    ! of the first element containing it, or 0 if not found.  Array_size
680    ! must be >= 1.
690    !
700    DEF FNSearch(Array_size,String_array$(*),Search_string$)
710    N=1
720    WHILE N <=Array_size AND NOT POS(String_array$(N),Search_string$)
730    N=N+1
740    END WHILE
750    IF (N>Array_size) THEN N=0
760    RETURN N
770    FNEND
780    !

790    ! Read a comma-separated list of floating-point values from Addr
```

```
800    ! into Array, and return the number read.  Array must be
810    ! dimensioned large enough to accept the maximum number of
820    ! returned values.
830    !
840    DEF FNRead(Addr,Array(*))
850    I=1
860    ON ERROR GOTO End_loop
870    REPEAT
880    ENTER Addr USING "%,16D,B";Array(I),Separator
890    I=I+1
900    UNTIL Separator=10! New-line
910 End_loop:      !
920    OFF ERROR
930    N=I-1
940    RETURN N
950    FNEND
```

Sending FACCH Messages

FACCH messages can be pre-loaded into the digital generator for call processing before they are sent.

```
DGGenerator:DATA:MESSage<space><Slot_number>,'<facch_message>'
```

The first 12-digit hexadecimal message must be preceded by a zero (0). For example, to have the digital generator output the FACCH message 3c8230400383 in slot 200, send the command:

```
DGGenerator:DATA:MESSage 200,'03c8230400383'
```

Up to four messages can be included in one command string. The second, third, and fourth messages must be preceded by a one (1). For example to output these three FACCH messages 0c50104050c0 000303233343 5363738393a0 starting at slot 250, send the command:

```
DGG:DATA:MESS 250,'00c50104050c0100030323334315363738393a0'
```

When multiple slots are pre-loaded, the slots must be sent in ascending order, or previous messages will be erased.

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