

**Agilent Technologies 8960 Series 10 Wireless Communications Test Set
Agilent Technologies E1963A W-CDMA Mobile Test Application**

Reference Guide

E1963A W-CDMA Mobile Test Application Revision A.01
1000-1749 (not orderable)

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www.agilent.com/find/8960support/



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U.S.A.

Edition/Print Date

All Editions and Updates of this manual and their creation dates are listed below.

November 2001 - E1963B W-CDMA Mobile Test Application Revision A.01

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies Inc. assumes no liability for the customer's failure to comply with these requirements.

GENERAL

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

All Light Emitting Diodes (LEDs) used in this product are Class 1 LEDs as per IEC 60825-1.

This product has been designed and tested in accordance with *IEC Publication 1010*, "Safety Requirements for Electronic Measuring Apparatus," 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.

ENVIRONMENTAL CONDITIONS

This instrument is intended for indoor use in an installation category II, pollution degree 2 environment. It is designed to operate at a maximum relative humidity of 95% and at altitudes of up to 2000 meters. Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

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.

BEFORE APPLYING POWER

Verify that the product is set to match the available line voltage, the correct fuse is installed, and all safety precautions are taken. Note the instrument's external markings described under Safety Symbols.

GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

FUSES

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes.

DO NOT REMOVE THE INSTRUMENT COVER







Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel.

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

WARNING **The WARNING sign 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 The CAUTION sign denotes a hazard. It calls attention to an operating procedure, 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 a CAUTION sign until the indicated conditions are fully understood and met.

Safety Symbols

-  Caution, refer to accompanying documents
-  Warning, risk of electric shock
-  Earth (ground) terminal
-  Alternating current
-  Frame or chassis terminal
-  Standby (supply). Units with this symbol are not completely disconnected from ac mains when this switch is off.

Product Markings

CE - the CE mark is a registered trademark of the European Community. A CE mark accompanied by a year indicated the year the design was proven.

CSA - 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 Technologies 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

Agilent Technologies Warranty Statement for Commercial Products

Agilent Technologies 8960 Series 10 Wireless Communications Test Set Agilent Technologies E1962B cdma2000 Mobile Test Application

Duration of Warranty: 1 year

1. Agilent Technologies warrants Agilent Technologies hardware, accessories and supplies against defects in materials and workmanship for the period specified above. If Agilent Technologies receives notice of such defects during the warranty period, Agilent Technologies 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 Technologies warrants that Agilent Technologies 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 Technologies receives notice of such defects during the warranty period, Agilent Technologies will replace software media which does not execute its programming instructions due to such defects.
3. Agilent Technologies does not warrant that the operation of Agilent Technologies products will be uninterrupted or error free. If Agilent Technologies 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 Technologies 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 Technologies. If customer schedules or delays Agilent Technologies 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 Technologies, (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 WARRANTY OR CONDITION, WHETHER WRITTEN OR ORAL IS EXPRESSED OR IMPLIED AND AGILENT TECHNOLOGIES SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OR CONDITIONS OR MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.
8. Agilent Technologies 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 Technologies 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 TECHNOLOGIES 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.

SHOULD AGILENT HAVE A NEGOTIATED CONTRACT WITH THE USER AND SHOULD ANY OF THE CONTRACT TERMS CONFLICT WITH THESE TERMS, THE CONTRACT TERMS SHALL CONTROL.

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.

Service and Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local Agilent Technologies Service Center. You can find a list of local service representatives on the Web at:

<http://www.agilent-tech.com/services/English/index.html>

If you do not have access to the Internet, one of these centers can direct you to your nearest representative:

United States Test and Measurement Call Center

(Toll free in US)

(800) 452-4844

Europe

(31 20) 547 9900

Canada

(905) 206-4725

Japan Measurement Assistance Center

(81) 426 56 7832

(81) 426 56 7840 (FAX)

Latin America

(305) 267 4288 (FAX)

Australia/New Zealand

1 800 629 485 (Australia)

0800 738 378 (New Zealand)

Asia-Pacific

(852) 2599 7777

(852) 2506 9285 (FAX)

Regional Sales Offices

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Test and Measurement Call Center
P.O. Box 4026
Englewood, CO 80155-4026

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Agilent Technologies Canada Inc.(tel) 1 877 894 4414
2660 Matheson Blvd. E
Mississauga, Ontario
L4W 5M2

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Agilent Technologies(tel) (3120) 547 9999
European Marketing Organization
P.O. Box 999
1180 AZ Amstelveen
The Netherlands

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Measurement Assistance Center(fax) (81) 426-56-7840
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Asia Pacific:

Agilent Technologies(tel) (852) 3197 7777
24/F, Cityplaza One,(fax) (852) 2506 9233
111 Kings Road,
Taikoo Shing, Hong Kong

DECLARATION OF CONFORMITY

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

Manufacturer's Name: Agilent Technologies UK Ltd. Agilent Technologies, Inc.
Manufacturer's Address: Electronic Products & Solutions 24001 E. Mission Avenue
Group - Queensferry Liberty Lake
South Queensferry Washington
West Lothian, EH30 9TG 99019-9599
Scotland, United Kingdom USA

Declares, that the product

Product Name: 8960 Series 10 Wireless Communications Test Set

Model Number: E5515B

Product Options: This declaration covers all options of the above product.

Conforms with the following European Directives:

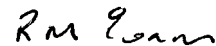
The product herewith compiles with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EFC (including 93/68/EFC) and carries the CE Marking accordingly.

EMC	Standard	Limit
	IEC 61326-1:1997+A1:1998/EN 61326-1:1997+A1:1998 CISPR 11:1990 / EN 55011:1991 IEC 61000-4-2:1995+A1:1998 / EN 61000-4-2:1995	Group 1 Class A ^[1] 4kV CD, 8kV AD 3 V/m, 80-1000 MHz
	IEC 61000-4-3:1995 / EN 61000-4-3:1995 IEC 61000-4-4:1995 / EN 61000-4-4:1995 IEC 61000-4-5:1995 / EN 61000-4-5:1995 IEC 61000-4-6:1996 / EN 61000-4-6:1996 IEC 61000-4-11:1994 / EN 61000-4-11:1994	0.5V signal lines, 1kV power lines 0.5 kV line-line, 1 kV line-ground 3V, 0.15-80 MHz 1 cycle, 100%
Safety:	IEC 61010-1:1990+A1:1992+A2:1995 / EN 61010-1:1993+A2:1995 Canada CSA C22.2 No. 1010.1:1992	

Supplemental Information:

^[1] The product was tested in a typical configuration with Agilent Technologies test systems

14 December 2000



R.M. Evans / Quality Manager

14 December 2000



W.V. Roland / Reliability & Regulatory
Engineering Manager

For further information, please contact your local Agilent Technologies sales office, agent, or distributor.
Authorized EU-representative: Agilent Technologies Deutschland GmbH, Herrenberger StraBe 130, D71034 Boblingen, Germany

DECLARATION OF CONFORMITY

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

Manufacturer's Name: Agilent Technologies UK Ltd. Agilent Technologies, Inc.
Manufacturer's Address: Electronic Products & Solutions Group - Queensferry South Queensferry West Lothian, EH30 9TG Scotland, United Kingdom 24001 E. Mission Avenue Liberty Lake Washington 99019-9599 USA

Declares, that the product

Product Name: 8960 Series 10 Wireless Communications Test Set

Model Number: E5515C

Product Options: This declaration covers all options of the above product.

Conforms with the following European Directives:

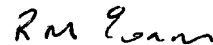
The product herewith compiles with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EFC (including 93/68/EFC) and carries the CE Marking accordingly.

EMC	Standard	Limit
	IEC 61326-1:1997+A1:1998/EN 61326:1997/A1:1998	Group 1 Class A ^[1]
	CISPR 11:1990 / EN 55011:1991	4kV CD, 8kV AD
	IEC 61000-4-2:1995+A1:1998 / EN 61000-4-2:1995	3 V/m, 80-1000 MHz
	IEC 61000-4-3:1995 / EN 61000-4-3:1995	0.5kV signal lines, 1kV power lines
	IEC 61000-4-4:1995 / EN 61000-4-4:1995	0.5 kV line-line, 1 kV line-ground
	IEC 61000-4-5:1995 / EN 61000-4-5:1995	3V, 0.15-80 MHz
	IEC 61000-4-6:1996 / EN 61000-4-6:1996	
	IEC 61000-4-11:1994 / EN 61000-4-11:1994	1 cycle, 100%
Safety:	IEC 61010-1:1990+A1:1992+A2:1995 / EN 61010-1:1993+A2:1995 Canada: CSA C22.2 No. 1010.1:1992	

Supplemental Information:

^[1] The product was tested in a typical configuration with Agilent Technologies test systems

01 May 2001



R.M. Evans / Quality Manager

01 May 2001



W.V. Roland / Reliability & Regulatory Engineering Manager

For further information, please contact your local Agilent Technologies sales office, agent, or distributor.
Authorized EU-representative: Agilent Technologies Deutschland GmbH, Herrenberger StraBe 130, D71034 Boblingen, Germany

DECLARATION OF CONFORMITY

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

Manufacturer's Name: Agilent Technologies, Inc.

Manufacturer's Address: 24001 E. Mission Avenue
Liberty Lake
Washington
99019-9599
USA

Declares, that the product

Product Name: 8960 Series 10 Wireless Communications Test Set

Model Number: E5515T

Product Options: This declaration covers all options of the above product.

Conforms with the following European Directives:

The product herewith compiles with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EFC (including 93/68/EFC) and carries the CE Marking accordingly.

EMC	Standard	Limit
	IEC 61326-1:1997+A1:1998/EN 61326-1:1997+A1:1998 CISPR 11:1990 / EN 55011:1991 IEC 61000-4-2:1995+A1:1998 / EN 61000-4-2:1995	Group 1 Class A ^[1] 4kV CD, 8kV AD
	IEC 61000-4-3:1995 / EN 61000-4-3:1995 IEC 61000-4-4:1995 / EN 61000-4-4:1995 IEC 61000-4-5:1995 / EN 61000-4-5:1995 IEC 61000-4-6:1996 / EN 61000-4-6:1996 IEC 61000-4-11:1994 / EN 61000-4-11:1994	3 V/m, 80-1000 MHz 0.5V signal lines, 1kV power lines 0.5 kV line-line, 1 kV line-ground 3V, 0.15-80 MHz 1 cycle, 100%
Safety:	IEC 61010-1:1990+A1:1992+A2:1995 / EN 61010-1:1993+A2:1995 Canada CSA C22.2 No. 1010.1:1992	

Supplemental Information:

^[1] The product was tested in a typical configuration with Agilent Technologies test systems

14 December 2000



*W.V. Roland / Reliability & Regulatory
Engineering Manager*

For further information, please contact your local Agilent Technologies sales office, agent, or distributor.
Authorized EU-representative: Agilent Technologies Deutschland GmbH, Herrenberger StraBe 130, D71034 Boblingen, Germany

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 a sound pressure emission (at the operator position) < 70 dB(A).

- Sound Pressure $L_p < 70$ dB(A).
- At Operator Position.
- 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 $L_p < 70$ dB(A).
- Am Arbeitsplatz.
- Normaler Betrieb.
- Nach ISO 7779:1988/EN 27779:1991 (Typprüfung).

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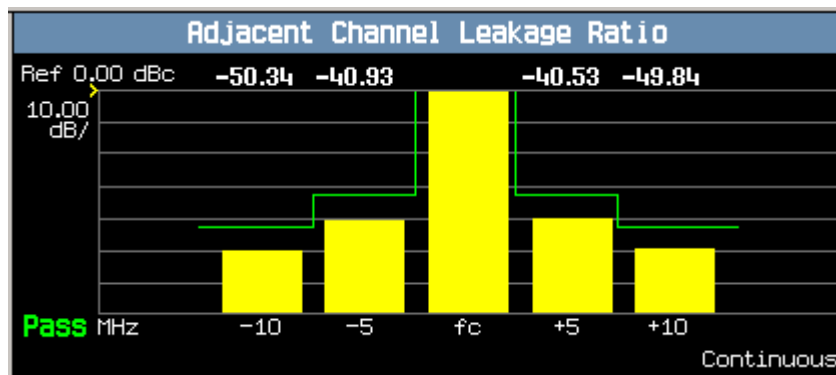
Adjacent Channel Leakage Ratio Measurement Description

How is an adjacent channel leakage ratio measurement made?

Adjacent channel leakage ratio measures the relative power at ± 5 MHz and ± 10 MHz offsets from the uplink channel. Power is measured through a Root-Raised Cosine (RRC) filter with a rolloff of $\alpha=0.22$, and a bandwidth equal to the chip rate (3.84 MHz). The ± 5 MHz measurements are referred to as the upper and lower first adjacent channels; the ± 10 MHz measurements are referred to as the upper and lower second adjacent channels. This measurement is defined in 3GPP TS 34.121, section 5.10, v3.2.0, Adjacent Channel Power Leakage Ratio (ACLR).

Measurements for individual offsets can be turned off to increase measurement speed when these measurements are not needed.

Measurements can be displayed in either numeric or graphical form. When the graphical display is used (shown below), limits can be set for each offset to form a “limit line.” When a limit is exceeded, the status changes from “Pass” to “Fail.”



Input Signal Requirements

- For this measurement the test set's receiver uses autoranging to adjust for the level of the signal being measured; therefore the expected signal level does not need to be specified during measurement setup.
- The frequency of the signal being measured must be in the range of 800 MHz to 1000 MHz, or from 1700 MHz to 1990 MHz.
- The level into the test set's RF IN/OUT connector must be in the range of +5 dBm to +28 dBm, in a 3.84 MHz bandwidth.

Trigger Source

The trigger source defaults to Auto for the adjacent channel leakage ratio measurement, and tries to use protocol triggering if the mobile station (UE) is synchronized to the test set. Immediate triggering is used if the mobile station is not synchronized.

Measurement Calibration

This measurement should be calibrated using the Calibrate Measurements function (CAL:MEAS?) under any of the following conditions:

- The E1963A W-CDMA test application was just activated and this measurement has not been calibrated yet. If you were using a different test application previous to activating the W-CDMA test application, or if you have just received your Agilent 8960 Series 10 test set with the W-CDMA test application installed, you must calibrate this measurement before using it.
- The temperature has changed by $\pm 10^{\circ}$ C or more since the last calibration. If this situation exists, the integrity indicator value is changed and a message is displayed indicating “Uncalibrated Due to Temperature”.
- One year has elapsed since the last calibration.

Related Topics

- [“Programming an Adjacent Channel Leakage Ratio Measurement”](#)
- [“Adjacent Channel Leakage Ratio Troubleshooting”](#)
- [“Test Adherence to Standards”](#)
- [“Triggering of Measurements”](#)
- [“Statistical Measurement Results”](#)
- [“Integrity Indicator”](#)

Audio Level Measurement Description

How is an Audio Level measurement made?

Audio Level measures the AC voltage of the signal applied to the front-panel AUDIO IN connectors, and is one of the Audio Analyzer measurements. Audio Level can be measured for signals in the frequency range of 100 Hz to 20 kHz, at levels from 1 mV_{peak} to 20V_{peak}. The measurement is made after any filtering is applied, and can be made using an rms or peak detector. The type of detector being used for the measurement is displayed next to the measurement value.

When measuring very low voltages, it may be helpful to use the Audio Analyzer's adjustable bandpass filter and the rms detector to reduce noise components.

This measurement is not affected by the Amplitude Offset setting.

Related Topics

[“Programming an Audio Level Measurement” on page 104](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“Audio Analyzer Measurement Description” on page 33](#)

[“Audio Analyzer Block Diagram” on page 35](#)

Audio Analyzer Measurement Description

How is an analog audio measurement made?

The Audio Analyzer can measure Audio Level (V), SINAD (dB), Distortion (%), and Audio Frequency. Measurements are made through the test set's front panel AUDIO IN connectors. When measuring a mobile's audio output, the audio signal may come from either an acoustic coupler or from a test interface connection to the mobile's audio circuitry.

See ["Audio Analyzer Block Diagram"](#) .

The AUDIO IN connectors feed the inputs to a floating-input differential amplifier, with each input having an impedance of about 100,000 ohms to chassis ground. For best noise immunity, connect the audio signal and its ground reference to the two input ports through shielded coaxial cables, or input the signal to the AUDIO IN HI connector and ground the AUDIO IN LO connector's center contact.

None of the analog audio measurement results are affected by the Amplitude Offset setting.

SINAD/Distortion State

Select On or Off to enable or disable the SINAD and Distortion measurements. When On, these measurement results are displayed below the Audio Level measurement and the SINAD/Distortion Fundamental Frequency must be entered to specify the audio frequency for the measurement (range: 100 Hz to 10 kHz). When Off, four dashes are displayed in place of the measurement results.

Audio Frequency State

Select On or Off to enable or disable the Audio Frequency measurement.

Filter Type

- None - no filtering is provided (default).
- 100 Hz BW Band Pass Filter (Tunable) - The 100 Hz BW BPF Center Frequency setting is available when this filter is selected, and can be set in the range of 300 Hz to 15 kHz.
- C-Message
- 50 Hz to 15 kHz
- 300 Hz to 15 kHz

Detector Type

Select either Peak or RMS (default) for making and displaying an Audio Level measurement (does not affect other measurements). The type of detector selected is displayed next to the Audio Level measurement results. A 1-volt rms sinewave input signal would measure $1.414 V_{\text{Peak}}$ when the Peak detector is used. A 1-volt peak input signal would measure $0.707 V_{\text{RMS}}$ when the RMS detector is used.

Expected Peak Voltage

The Expected Amplitude sets the analog audio clipping level and must be set. This voltage is always the *absolute peak* audio input signal voltage expected at the AUDIO IN connectors, and must be in the range of $7.07 \text{ mV}_{\text{peak}}$ ($5 \text{ mV}_{\text{rms}}$) to $20 \text{ V}_{\text{peak}}$. Remember, measuring a 1-volt rms sinewave input signal would require a $1.414 \text{ V}_{\text{peak}}$ expected voltage value to avoid clipping (over-driving) the input.

De-Emphasis State

Set to On or Off (default) to enable or disable 750 microsecond de-emphasis.

Expander Reference Level

Set value from 10 mV/kHz to 10 V/kHz, or Off (default). Entering a numeric value automatically turns the state to On. Entering Off disables the expander (state = off).

Trigger Source

Audio Analyzer measurements use immediate triggering and are continuously re-triggered by the analyzer any time the Trigger Arm parameter is set to Continuous. Trigger timing is independent of any mobile protocol signaling.

Related Topics

[“Audio Analyzer Block Diagram” on page 35](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“Audio Level Measurement Description” on page 32](#)

[“Audio Frequency Measurement Description” on page 36](#)

[“SINAD Measurement Description” on page 41](#)

[“Distortion Measurement Description” on page 39](#)

[“Programming an Audio Frequency Measurement” on page 106](#)

[“Programming an Audio Level Measurement” on page 104](#)

[“Programming a SINAD Measurement” on page 111](#)

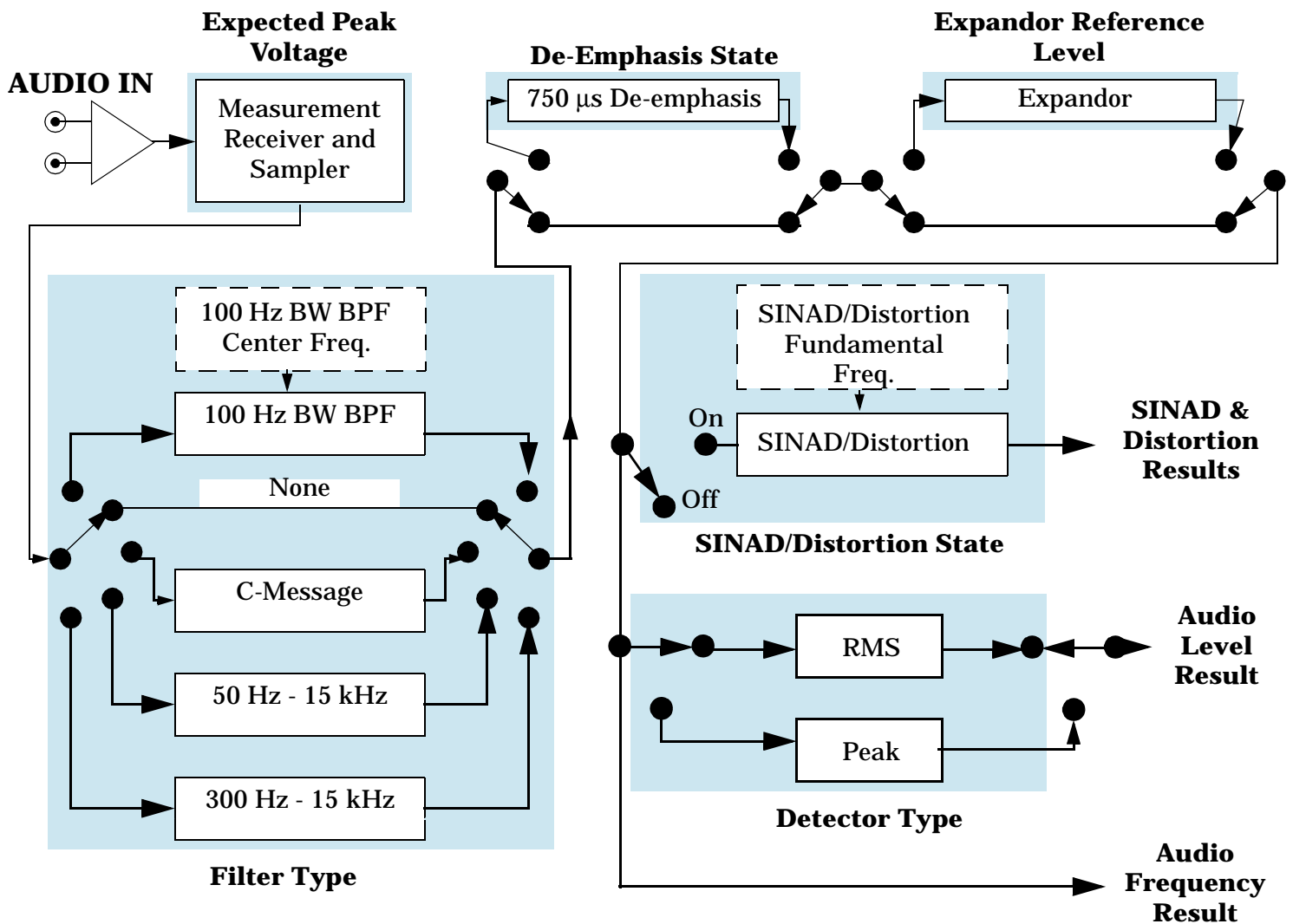
[“Programming a Distortion Measurement” on page 108](#)

[“Statistical Measurement Results” on page 152 \(Multi-measurements\)](#)

[“Triggering of Measurements” on page 148](#)

[“Measurement Timeouts” on page 146](#)

Audio Analyzer Block Diagram



Related Topics

["Audio Analyzer Measurement Description"](#)

Audio Frequency Measurement Description

Related Topics

[“Programming an Audio Frequency Measurement” on page 106](#)

[“Audio Analyzer Measurement Description” on page 33](#)

[“Audio Analyzer Block Diagram” on page 35](#)

[“AFANalyzer Troubleshooting” on page 451](#)

Channel Power Measurement Description

How is a Channel Power Measurement Made?

Channel power is a band-limited power measurement that measures power present at the test set's RF IN/OUT port during a user-specified interval. The measurement measures power using a Root-Raised Cosine (RRC) filter with a rolloff of $\alpha=0.22$, and a bandwidth equal to the chip rate (3.84 MHz).

This is the power measurement to use for the Transmit Off Power test (3GPP TS 34.121, section 5.5.1, v3.2.0).

Although it is specified up to +28 dBm, the channel power measurement is not as accurate as the thermal power measurement at higher power levels. Use the thermal power measurement to measure Maximum Output Power (3GPP TS 34.121, section 5.2). See "[Thermal Power Measurement Description](#)".

Differences in Thermal Power and Channel Power Measurement Results

Because the channel power measurement is a filtered (band-limited) measurement, its results are typically about 0.25 dB lower than the thermal power measurement results.

Input Signal Requirements

- This measurement does not autorange, therefore the expected power level from the mobile station (UE) is set using the current MS Target Power setting, or by using manual receiver power control and specifying the expected power level. See "[Receiver Control](#)".
- The frequency of the signal being measured must be in the range of 800 MHz to 1000 MHz, or from 1700 MHz to 1990 MHz.
- The level into the test set's RF IN/OUT connector must be in the range of -61 dBm to +28 dBm, in a 3.84 MHz bandwidth.

Trigger Source

The trigger source defaults to Auto for the channel power measurement, and tries to use protocol triggering if the mobile station (UE) is synchronized to the test set. Immediate triggering is used if the mobile station is not synchronized.

RF Rise triggering is provided to measure power during PRACH bursts. The burst's on state level must be >-40 dBm, and the off state level must be <-60 dBm, for this trigger to work correctly.

This measurement can be made over a period of .1 ms to 10 ms by altering the Measurement Interval. The measurement can be made during a specific timeslot by changing the Trigger Delay.

Measurement Calibration

Under certain conditions, this measurement should be calibrated using the Calibrate Measurements function (CAL:MEAS?). This function corrects for gains, losses, and timing fluctuations within the test set. *A mobile station (UE) must not be transmitting into the test set during this calibration.*

Calibrate this measurement under any of the following conditions:

- The E1963A W-CDMA test application was just activated and this measurement has not been calibrated yet. If you were using a different test application previous to activating the W-CDMA test application, or if you have just received your Agilent 8960 Series 10 test set with the W-CDMA test application installed, you must calibrate this measurement before using it.
- The temperature has changed by $\pm 10^{\circ}$ C or more since the last calibration. If this situation exists, the integrity indicator value is changed and a message is displayed indicating “Uncalibrated Due to Temperature”.
- One year has expired since the last calibration.

Related Topics

- [“Programming a Channel Power Measurement”](#)
- [“Channel Power Troubleshooting”](#)
- [“Test Adherence to Standards”](#)
- [“Triggering of Measurements”](#)
- [“Statistical Measurement Results”](#)
- [“Integrity Indicator”](#)

Distortion Measurement Description

How is a Distortion measurement made?

Distortion is an audio quality measurement that compares the audio signal level from the mobile at a specified (desired) frequency to the level of signals present at other frequencies. The audio signals from the mobile are typically measured after digital demodulation of the traffic channel.

The test set makes two measurements to determine distortion. First, the test set measures the total audio signal level into the Audio Analyzer. Next, a precise notch filter is then used to remove the signal at the specified frequency. The remaining signal level indicates the level of unwanted signals (distortion). Distortion is expressed as a percentage of the total audio signal.

Distortion can be measured in the range of 100 Hz to 10 kHz. For information on using the Audio Analyzer, see [“Audio Analyzer Measurement Description” on page 33](#).

The distortion measurement can be used to perform the audio harmonic distortion test. For example, in the AMPS system two audio signals are used: a 1004 Hz tone and the 6000 Hz SAT. The 1004 Hz tone is notched out to make the measurement.

Related Topics

[“Audio Analyzer Measurement Description” on page 33](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“Programming a Distortion Measurement” on page 108](#)

[“Test Adherence to Standards” on page 45](#)

Loopback Bit Error Ratio Measurement Description

How is a Loopback Bit Error Ratio measurement made?

When the test set measures loopback bit error ratio, it sends a known data pattern on the downlink dedicated traffic channel (DTCH) to a mobile station (UE) that is configured in loopback mode 1 (see 3GPP TS 34.109, v3.1.0). The mobile station decodes the data and re-transmits it on the uplink DTCH. The test set analyzes the uplink data to see how closely it matches the data bits originally sent on the downlink. The measurement result is the ratio of incorrectly received bits to the total bits sent to the UE, expressed as a percentage (%).

This measurement is typically performed at low cell power levels to measure the sensitivity of the mobile station's receiver; the lower the level of signal that the mobile station can receive and still correctly decode the data, the better the sensitivity. The receiver sensitivity test is described in 3GPP TS 34.121, section 6.2, v3.2.0, *Reference Sensitivity Level*. This measurement can also be used for the *Maximum Input Level* test, 3GPP TS 34.121, section 6.2, v3.2.0.

The number of data bits to send during the measurement is selectable by the user. However, the actual number of bits used to analyze the data is always the largest even multiple of the number of bits needed to fill a DTCH transport block for the transmitted format. For the 12.2 kbps reference measurement channel (RMC) used in FDD Test operating mode, the transport block is 244 bits.

Mobile Station (UE) Control During FDD Test Mode Operation

The FDD Test operating mode does not provide radio bearer setup control of the mobile station (UE) for test mode operation. The operator must configure the mobile station in loopback mode 1 and synchronize it to the test set's downlink signal in order to make this measurement in FDD Test operating mode. Refer to "[FDD Test Operating Mode](#)".

The uplink transport format must include both the DTCH and the DCCH; however, only the DTCH information is used for the loopback bit error ratio measurement.

Input Signal Requirements

- The expected power into the test set must be set in order to maintain the link with the mobile station. This is done using the MS Target Power setting or by using manual receiver power control and specifying the expected power level. See "[Receiver Control](#)".

Trigger Source

The trigger source is always protocol.

Related Topics

["Programming a Loopback Bit Error Ratio Measurement"](#)

["Loopback Bit Error Ratio Troubleshooting"](#)

SINAD Measurement Description

How is a SINAD measurement made?

SINAD is a receiver audio quality measurement that is typically used for mobile stations operating on an analog system, such as AMPS. It is the ratio of Signal+Noise+Distortion divided by Noise+Distortion, expressed in dB. SINAD is measured using the test set's Audio Analyzer. SINAD can be measured in the range of 100 Hz to 10 kHz. For information on using the Audio Analyzer, see [“Audio Analyzer Measurement Description”](#).

The SINAD measurement is used to determine receiver RF sensitivity. SINAD is usually measured either of two ways:

- Reduce the Cell Power from the test set until 12 dB SINAD is displayed (re-triggering for each measurement), or
- Set the Cell Power from the test set to a specified low level and verify a ≥ 12 dB SINAD reading.

Difference in Agilent 8960 Series 10 and 8920B Test Set SINAD Measurements

If you have previously used the Agilent 8920B RF Communications Test Set to measure SINAD, you may notice that the Agilent 8960 Series 10 test set's SINAD value may be lower by up to 0.8 dB when measuring 12 dB SINAD. This is due to the more precise digital notch filter used by the 8960, causing a more accurate noise measurement to be made. The 8920B uses an analog filter that does not have as tight a filter notch as the 8960.

Related Topics

[“Programming a SINAD Measurement”](#)

[“AFANalyzer Troubleshooting”](#)

[“Audio Analyzer Measurement Description”](#)

[“Test Adherence to Standards”](#)

Thermal Power Measurement Description

How is a thermal power measurement made?

Thermal power is a broadband, unfiltered measurement that measures all power present at the test set's RF IN/OUT connector using a thermal detector. Because of its high accuracy when measuring power up to +28 dBm, this is the preferred measurement to use for higher power measurements, such as the Maximum Output Power test (3GPP TS 34.121, section 5.2, v3.2.0).

The thermal power measurement automatically zeroes itself for each measurement; no other calibration is required. To meet specified performance, the test set must be operated in the temperature range of 20° C to 55° C.

The thermal power measurement is not as fast as the channel power measurement, and is not intended to measure signal levels below -10 dBm. Use the channel power measurement to measure power levels from -11 dBm to -61 dBm, or when maximum measurement speed is required. See "[Channel Power Measurement Description](#)" on page 37.

Differences in Thermal Power and Channel Power Measurement Results

Because the thermal power measurement is an unfiltered measurement, its results are typically about 0.25 dB higher than the filtered channel power measurement results.

Input Signal Requirements

- For this measurement the test set's receiver uses auto-ranging to adjust for the level of the signal being measured; therefore the expected signal level does not need to be specified during measurement setup.
- For specified accuracy, the frequency of the signal being measured must be in the range of 800 MHz to 1000 MHz, or 1700 MHz to 1990 MHz.
- The level into the test set's RF IN/OUT connector must be in the range of -10 dBm to +28 dBm for greatest accuracy (although signals can be measured down to -20 dBm with degraded accuracy).
- This measurement is unfiltered, so all signals present at the RF IN/OUT connector affect the measurement results.

Trigger Source

No synchronization between the test set and the mobile station (UE) is needed, so immediate triggering is always used for this measurement. No trigger delay is available.

Related Topics

- "[Programming a Thermal Power Measurement](#)"
- "[Thermal Power Troubleshooting](#)"
- "[Statistical Measurement Results](#)"
- "[Triggering of Measurements](#)"
- "[Test Adherence to Standards](#)"

Waveform Quality Measurement Description

How is a waveform quality measurement made?

This measurement compares the received signal's IQ modulation characteristics to an ideal signal to determine the composite error vector magnitude (EVM), frequency error, origin offset, phase error, and magnitude error of the received signal.

The frequency error result satisfies the requirements for 3GPP TS 34.121, section 5.3, v3.2.0, *Frequency Error*. The error vector magnitude result satisfies the requirements for 3GPP TS 34.121, section 5.13.1, v3.2.0, *Error Vector Magnitude*.

The measurement is made during one user-selected timeslot.

RF In/Out Amplitude offsets entered do not affect these measurement results unless the received signal level becomes too low to accurately detect relative I/Q modulation vector transitions.

Early Release Measurement Differences From 3GPP TS 34.121, section 5.13, v3.2.0

The initial FDD Test Mode-only release of this test application was designed to be used for the Transmit Modulation test in 3GPP TS 34.121, section 5.13, with the following exceptions:

- This release only supports the 12.2k reference measurement channel (RMC).
- Peak Code Domain Error (section 5.13.2.1) is not available in this release, since that measurement is intended for multi-code signals and only one code is used in FDD test mode.

Input Signal Requirements

- This measurement does not autorange, therefore the expected power level from the mobile station (UE) is set using the current MS Target Power setting, or by using manual receiver power control and specifying the manual power level. See ["Receiver Control"](#).
- The frequency of the signal being measured must be in the range of 800 MHz to 1000 MHz, or from 1700 MHz to 1990 MHz.
- The level into the test set's RF IN/OUT connector must be in the range of -25 dBm to +28 dBm.
- Maximum measurable EVM = 35%
- Maximum measurable frequency error = ± 1 kHz

Trigger Source

The test set must be synchronized to the mobile station (UE) to make a waveform quality measurement; therefore protocol triggering is always used. The measurement is performed during one timeslot. The timeslot to use for the measurement is selectable (0 to 14).

Measurement Calibration

Under certain conditions, this measurement should be calibrated using the Calibrate Measurements function (CAL:MEAS?). This function corrects for gains, losses, and timing fluctuations within the test set. *A mobile station (UE) must not be transmitting into the test set during this calibration.*

Calibrate this measurement under any of the following conditions:

- The E1963A W-CDMA test application was just activated and this measurement has not been calibrated yet. If you were using a different test application previous to activating the W-CDMA test application, or if you have just received your Agilent 8960 Series 10 test set with the W-CDMA test application installed, you must calibrate this measurement before using it.
- The temperature has changed by $\pm 10^\circ$ C or more since the last calibration. If this situation exists, the integrity indicator value is changed and a message is displayed indicating “Uncalibrated Due to Temperature”.
- One year has expired since the last calibration.

Related Topics

- [“Programming a Waveform Quality Measurement”](#)
- [“Waveform Quality Troubleshooting”](#)
- [“Test Adherence to Standards”](#)
- [“Triggering of Measurements”](#)
- [“Statistical Measurement Results”](#)
- [“Integrity Indicator”](#)

Test Adherence to Standards

The following information describes the implementation of the measurements in the E1963A Mobile Test Application and their compliance with established standards.

Thermal Power

Thermal power is an unfiltered, broadband RF power measurement, that is intended for the Maximum Output Power test (3GPP TS 34.121, section 5.2). At the time of this writing, the 3GPP standard specifies that this measurement be made over 1 timeslot (667 μ s); however, the implementation of this measurement in the Agilent 8960 requires 10 ms.

Channel Power

Channel power is a filtered RF power measurement, using a Root-Raised Cosine (RRC) filter with a rolloff of $\alpha=0.22$, and a bandwidth equal to the chip rate (3.84 MHz). This measurement meets the requirements for the following tests: *Transmit Off Power* (3GPP TS 34.121, section 5.5.1).

Adjacent Channel Leakage Ratio

Adjacent channel leakage ratio (ACLR) measures RF power at +/-5 MHz and +/-10 MHz offsets from the carrier (center) frequency, using a Root-Raised Cosine (RRC) filter with a rolloff of $\alpha=0.22$, and a bandwidth equal to the chip rate (3.84 MHz). This measurement meets the requirements defined in 3GPP TS 34.121, section 5.10, Adjacent Channel Power Leakage Ratio (ACLR).

Waveform Quality

Waveform quality performs the following measurements: error vector magnitude (EVM), frequency error, origin offset, phase error, magnitude error. The frequency error result meets the requirements for 3GPP TS 34.121, section 5.3, Frequency Error.

For this revision of the W-CDMA test application, the error vector magnitude result meets the requirements for 3GPP TS 34.121, section 5.13.1, Error Vector Magnitude, with the following exceptions:

- This release only supports the 12.2k reference measurement channel (RMC).
- Peak Code Domain Error (section 5.13.2.1) is not available in this release, since that measurement is intended for multi-code signals and only one code is used in FDD test mode.

Frequency Error

Frequency error compares the expected uplink channel frequency to the measured uplink channel frequency, and is included with the waveform quality measurement results. See [“Waveform Quality”](#).

Loopback Bit Error Ratio

Loopback BER compares the data it sends on the downlink signal to the data it receives on the uplink signal, with the UE operating in loopback mode 1 (as per 3GPP TS 34.109, section 5.3.2.6.2, *Loopback of RLC SDUs*). This is typically done when measuring the sensitivity of the UE receiver. This measurement meets the requirements of 3GPP TS 34.121, section 6.2, *Reference Sensitivity Level*.

Amplitude Offset

Description

Amplitude offsets compensate for loss or gain between the test set's RF IN/OUT front panel connector and the mobile station's RF connector.

To access the amplitude offset feature, press the SYSTEM CONFIG key, followed by the RF IN/OUT Amptd Offset key, F5.

Amplitude offset settings are preserved during power cycles or instrument preset.

Setting Up Amplitude Offsets and Frequency Points

Up to 20 frequency points can be assigned an amplitude offset. Negative amplitude offset values should be entered when there is a loss through the RF cabling and test fixtures and positive values should be entered when there is a gain.

The RF IN/OUT Amplitude Offset table displays the current (on/off) state of the amplitude offset feature. There are also 20 rows for entering frequencies and 20 rows for entering corresponding offset values. To enter values in the table use the RF IN/OUT Amplitude Offset Setup menu.

To set up amplitude offsets remotely, one comma-separated string is sent to set up frequency points and another comma-separated string assigns the corresponding amplitudes.

GPIO Commands `OUTPUT 714;"SYSTEM:CORRECTION:SFREQUENCY 1710.2 MHZ,1805.2 MHZ,1784.8 MHZ,1879.8 MHZ"`

!sets the first 4 frequencies in the amplitude offset table.

`OUTPUT 714;"SYSTEM:CORRECTION:SGAIN -2.55,-3.12,-3.68,-4.23"`

!sets the first 4 amplitude offsets in the amplitude offset table.

Turning amplitude offsets on/off

When the RF IN/OUT Amplitude Offset State is on, all offsets that are not individually turned off are applied and the word "Offset" appears in the Instrument Status Area of the test set's display.

If the RF IN/OUT Amplitude Offset State is off, none of the amplitude offsets are applied.

GPIO Command `OUTPUT 714;"SYSTEM:CORRECTION:STATE ON"`

!Sets the RF IN/OUT Amplitude Offset State to On

NOTE If the RF IN/OUT Amplitude Offset State is turned off, none of the amplitude offsets are on, even if values are entered for the individual offsets.

Examples of Amplitude Offset Behavior

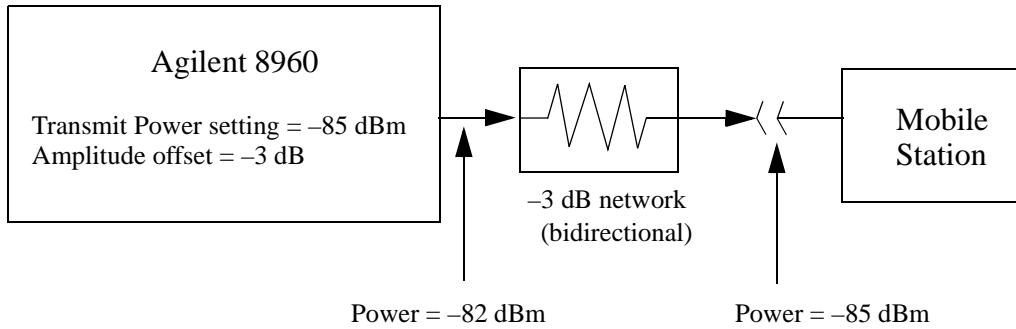
When the amplitude offset table entries accurately represent the loss in all components (cabling, connectors, and test fixturing) in the signal path between the test set and the mobile station, the test set will make the necessary adjustments in both receiver and transmitter measurements.

Mobile Station Receiver Example

When you set a transmit power level, the test set uses the amplitude offset value to adjust the power so that the test set's transmit power level refers to the power level received at the mobile station.

For example, with the test set's transmit power set to -85 dBm and a -3 dB amplitude offset the actual power level transmitted from the test set will be automatically offset to -82 dBm. With a 3 dB loss in the signal path the mobile station will receive -85 dBm, the actual setting.

Figure 1. Amplitude Offset Mobile Station Receiver Example



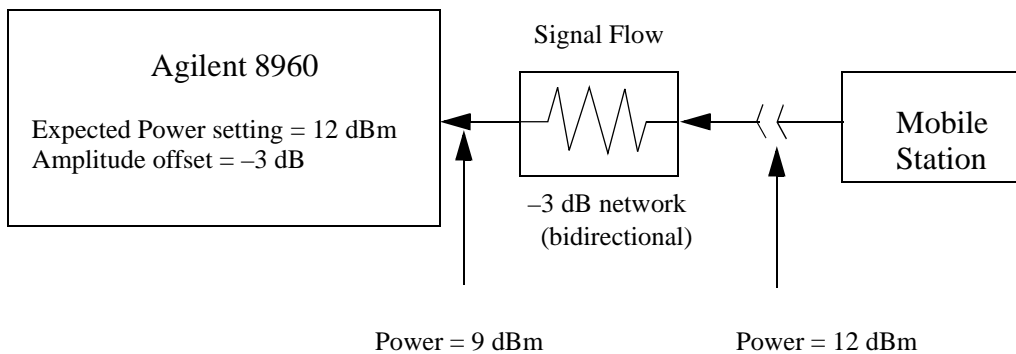
Mobile Station Transmitter Example

When you measure power from the mobile station, the displayed and queried values are offset to show the level at the mobile station.

For example, with the mobile station transmitting 12 dBm and a -3 dB amplitude offset is entered, the measured power at the test set would be 9 dBm. The displayed power level is automatically adjusted to 12 dBm to show the level at the mobile station.

If the expected power, which can be set manually or automatically is 12 dBm, the test set's internal hardware adjusts itself to receive 9 dBm which is the actual power from the mobile station after 3 dB loss in the network.

Figure 2. Amplitude Offset Mobile Station Transmitter Example



Amplitude Offsets Between Frequency Settings

If mobile station testing is performed at frequencies that do not have amplitude offsets assigned to them, the test set will estimate an amplitude offset based on the nearest settings. For example, the following screen shows five amplitude offsets for frequencies ranging from 890.2 MHz to 1710.2 MHz.

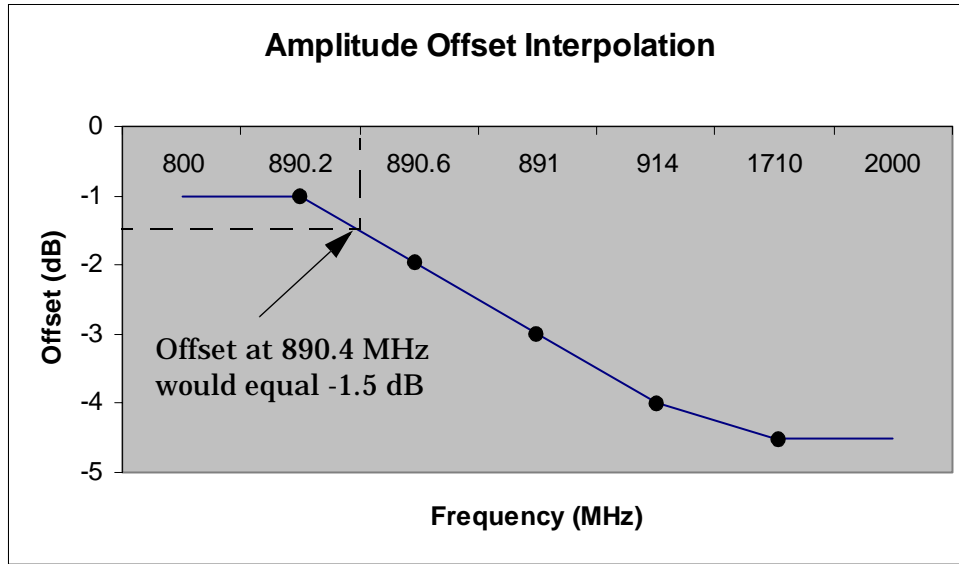
Figure 3. RF IN/OUT Amplitude Offset Setup

System Config Screen						
RF IN/OUT	RF IN/OUT Amplitude Offset					Utilities
	RF IN/OUT Amplitude Offset State: On					Message Log
	<u>Number</u>	<u>Frequency (MHz)</u>	<u>Offset (dB)</u>			
	1	890.20	-1.00			
	2	890.60	-2.00			
	3	891.00	-3.00			
	4	914.00	-4.00			
	5	1710.20	-4.50			
	6	Off	Off			
	7	Off	Off			
	8	Off	Off			
RF IN/OUT Amptd Offset Setup ▾	RF IN/OUT Amplitude Offset Setup			Value		
	RF In/Out Amplitude Offset State			On		
	Frequency 1			890.200 MHz		
	Offset 1			-1.00 dB		
	Frequency 2			890.600 MHz		
	Offset 2			-2.00 dB		
	Frequency 3			891.000 MHz		
	Offset 3			-3.00 dB		
Close Menu	Frequency 4			914.000 MHz		
	Active Cell			Sys Type: IS-2000		
	Idle					
		IntRef	Offset			
						1 of 2

For test frequencies between the lowest (890.2 MHz) and highest (1710.2 MHz) frequency points that are not entered in the table, the test set will calculate offsets using piece-wise linear interpolation.

The graph shown in [Figure 4](#) is a conceptual representation of the test set's amplitude offset configuration using the settings from the RF IN/OUT Amplitude Offset table in [Figure 3](#). "RF IN/OUT Amplitude Offset Setup". Each of the five points are shown on a non-scaled frequency versus amplitude offset graph. At a test frequency of 890.4 MHz, which is midway between point number one (-1 dB) and point number two (-2 dB) the test set applies an offset of -1.5 dB. Be aware that since amplitude offsets are in units of dB, this piece-wise linear interpolation does not produce a linear transition from point to point.

Figure 4. Amplitude Offset Interpolation



If testing is done outside the range of frequencies bounded by the lowest and highest frequency entries, the test set simply uses the amplitude offset that is paired with the nearest frequency point.

IMPORTANT It is highly recommended that amplitude offsets are set up for each test frequency. This eliminates inaccuracies due to the mismatch between the test set's linear interpolation and the actual frequency response of the RF path between the test set and mobile station.

Related Topics

[“SYSTEM:CORREction”](#)

Call Processing

FDD Test Operating Mode

During frequency division duplex (FDD) test mode operation, call processing operations, such as base station origination (paging) and location registration, are not available to establish a connection between the test set and the UE¹ (mobile station). Instead, when FDD test mode is selected, the test set immediately starts transmitting a downlink signal containing a dedicated physical channel (DPCH) that is configured as a 12.2 kbps reference measurement channel (RMC). The downlink signal also contains the overhead channels required to allow the UE to synchronize to the test set and decode transmitted data; the primary common pilot channel (CPICH), primary common control physical channel (P-CCPCH), and the synchronization channel (SCH). The paging indicator channel (PICH) is also included, and OCNS and AWGN are available if desired (see “[Noise Sources on the Downlink](#)”).

To synchronize with the test set's downlink signal, the UE must be manually controlled by the operator to place it in the correct configuration for it to receive the downlink signal. After the UE has synchronized to the test set, the UE must be controlled by the operator to begin transmitting a corresponding uplink signal that also consists of a dedicated physical channel (DPCH) configured as a 12.2 kbps RMC (described in 3GPP TS 25.101, Annex A.2.1, *UL Reference Measurement Channel (12.2 kbps)*).

The test set can perform thermal power, channel power, waveform quality, and adjacent channel leakage ratio (ACLR) measurements on the uplink signal. Loopback bit error ratio (BER) can be tested if the UE provides a loopback mode that conforms to 3GPP TS 34.109, section 5.3.2.6.2, *Loopback of RLC SDUs*. For either the loopback BER or modulation quality measurements to function, the uplink dedicated physical data channel (DPDCH) spreading factor must be the minimum allowed for the channel type; which is 64 for the 12.2 kbps reference measurement channel. Additionally, for the loopback BER measurement, the uplink DPDCH transport format must be set so both the dedicated traffic channel (DTCH) and dedicated control channel (DCCH) are present (however, the test set will ignore the contents of the DCCH so the actual content of this channel is not relevant).

The test set ignores transport format combination indicator (TFCI) and transmit power control (TPC) bits sent on the uplink.

The following example selects FDD Test operating mode via GPIB:

```
OUTPUT 714;"CALL:OPERating:MODE FDDT"
```

UE (Mobile Station) Control During FDD Test Mode

In FDD Test operating mode, the test set does not negotiate with the UE to set up a call, or provide any other form of interactive control of the UE. User-selected patterns of power control (TPC) or transport format indication (TFCI) commands can be sent to the UE on the downlink, but the test set does not assume or verify that the UE responded.

1. UE stands for User Equipment, and is the term used in the 3GPP standards. This may be a mobile station (cellular phone) or any other transceiver device using the W-CDMA protocols.

Synchronizing the UE to the Test Set's Downlink to Make Measurements

When the test set and the UE are synchronized, the UE uplink frame starts 1024 chips after the receiving the corresponding downlink frame. Measurements that require synchronization will not trigger correctly (or at all) if this timing relationship does not exist. The following test set controls must match your UE configuration to be able to get it to synchronize to the test set's downlink and transmit an uplink signal that the test set can receive and measure:

- **“Downlink Channel”** - The UE must be set to receive the downlink signal on this channel.
- **“Uplink Channel”** - The UE must be set to transmit an uplink signal on this channel.
- **Downlink “Channel Codes”** - The UE must be set to expect the following code settings from the test set on the downlink:
 - Primary Scrambling Code
 - PICH Channelization Code
 - DPCH 12.2 RMC Channelization Code
- **“Transport Format Combination Indicator Pattern” (TFCI)** - If the UE is configured to respond to TFCI, the appropriate TFCI value must be entered on the test set and the UE must be able to decode the TFCI and correctly configure itself to accept the downlink data (in this case, the format for the 12.2k RMC).
- **“Cell Power”** - the power level out of the test set must be high enough for the UE to receive the downlink signal and decode the data.
- **“Uplink Scrambling Code”** - The scrambling code the UE is transmitting on the uplink signal.
- **“MS Target Power”** - The power level that the UE is expected to be transmitting at.

Downlink Channel Settings

The downlink signal consists of the following channels:

- **Common pilot channel (CPICH):** Used by the UE (mobile station) to find the primary scrambling code and to help determine its transmit power during open loop power control.
- **Primary common control physical channel (P-CCPCH):** Contains the broadcast channel (BCH) that normally provides system information to the UE. In FDD Test operating mode, this channel consists of pseudo-random bit sequence (PRBS) data and a valid system frame number (SFN).
- **Synchronization channel (SCH):** Includes the primary and secondary synchronization channels (PSC and SSC) that contain timing information to allow the UE to synchronize to the test set (or base station).
- **Page indicator channel (PICH):** Used to alert the UE that it is being paged. In FDD test mode, the test set only provides a user specified bit pattern to allow the operator to verify that the UE is correctly decoding this channel.
- **Dedicated physical channel (DPCH):** Contains the dedicated physical control channel (DPCCH) which includes the transmit power control (TPC) and transmit format combination indicator (TFCI), and the dedicated physical data channel (DPDCH) which contains the user data (which is always the 12.2 kbps RMC for this test mode).

The relative level, desired level, spreading factor, and channel code for each of these channels, is displayed in the Downlink Code Channel Information window on the test set.

Channel Codes

The following downlink channel codes can be specified:

- Primary scrambling code (“[CALL\[:CELL\]:SCODE](#)”). *This value must match the UE expected downlink scrambling code in order for the UE to decode the downlink channels and synchronize to the test set.* The current setting is displayed in the Downlink Code Channel Information window on the test set. This value is used to configure the secondary synchronization channel (S-SCH).
- PICH channelization code (“[CALL:PICHannel](#)”).
- DPCH 12.2 RMC channelization code (“[CALL:DPCHannel](#)”).

Channel Levels

The relative level of all FDD test channels can be individually set or turned off (although the P-CCPCH and the SCH are controlled together). The level of each active channel is a fraction of the total cell power, expressed in dB. If the summed level of all channels is less than one, OCNS is turned on to account for the difference. See “[CALL:FDDTest](#)”.

Noise Sources on the Downlink

Additive White Gaussian Noise (AWGN)

AWGN can be summed into the downlink signal to simulate outside signal interference. When enabled, the AWGN level must be set within +/-10 dB of the cell power setting. See “[CALL:AWGNNoise:POWER](#)”.

Orthogonal Channel Noise Simulator (OCNS)

OCNS is used to simulate additional users on the downlink. OCNS is automatically enabled when the sum of the levels of all the enabled downlink physical channels is less than the cell power setting. OCNS is made up of the following 16 separate code channels: 2, 11, 17, 23, 31, 38, 47, 55, 62, 69, 78, 85, 94, 113, 119, and 125. All channels use a spreading factor of 128. The current setting is displayed in the Downlink Code Channel Information window on the test set.

As individual downlink channel levels are adjusted, the composite OCNS level is automatically set to a value equal to the difference between the summed downlink channel levels and the cell power setting. The fraction of the composite OCNS power that is allocated to each of the code channels making up the composite OCNS varies for each channel, and cannot be changed. See “[CALL:OCNSource](#)”.

Other Downlink Signal Settings

Cell Power

This setting specifies the combined power level of all code channels on the downlink from the test set, expressed in dBm/3.84 MHz (including OCNS, if used). *This does not include AWGN power.*

The Call Setup Screen displays a window entitled `Generated Power Level Information`. The `Total RF Power` listed in that window is the sum of the `Cell Power` and `AWGN Power` levels. The power level at the RF IN/OUT or RF OUT ONLY connector is the `Current Level of the Total RF Power` plus any amplitude offsets that have been entered. See “[Amplitude Offset](#)” for more information on entering amplitude offsets.

MS Target Power

This setting specifies the expected power level from the UE (mobile station). When using automatic receiver control (the default setting), the test set uses the MS Target Power setting to set the input range for its measurement and uplink receivers. If the transmitted level from the UE is above or below the range expected by the receivers, an Under Range or Over Range message and integrity indicator are produced. This setting is not used during manual receiver control.

This setting does not anticipate a change in UE power output when sending closed loop power control changes or transmit power control (TPC) commands during FDD Test mode operation. It is only used to indicate the expected power level from the UE as determined by the user. See [“Receiver Control”](#) for information on setting the expected power level into the test set.

Transport Format Combination Indicator Pattern

The TFCI pattern tells the UE which transport formats to use for communications between the downlink physical channels protocol layer (L1) and the medium access control (MAC) layer. In FDD Test mode, this value does not correspond to any specific transport channel format; it is provided to allow the user to determine if their UE is correctly decoding this value.

If the UE is configured to respond to the TFCI, this value must match the UE transport format configuration in order for the UE to decode the downlink channels and synchronize to the test set. See [“CALL:FDDTest”](#).

Power Control Settings

Power control commands can be sent by specifying the uplink closed loop power control data or by sending transmit power control (TPC) step up/step down bit patterns. However, the user must verify that the UE correctly decoded the power control data, either by verifying that the power level from the UE did change or by looking at the UE decoded downlink data. If the UE power output does change in response to the change order, the user must change the test set's expected power level (MS Target Power) when making measurements that do not use autoranging. See [“MS Target Power”](#). See also [“CALL\[:CELL\]:CLPControl:UPLink”](#) and [“CALL:FDDTest:CLPControl:UPLink:MODE”](#) for a description of the GPIB commands for power control.

Paging Indicator Settings

Downlink paging indicator channel data can be set to all ones or all zeroes. However, the user must verify that the UE has correctly decoded the page indicator data. See [“CALL:PICHannel:DATA”](#).

Traffic Channel (DTCH) Data

Downlink dedicated traffic channel (DTCH) data of various types can be sent. To determine if the UE has correctly decoded the data stream, you can use the test set's loopback bit error ratio measurement or use your UE built in bit error reporting (if available). See [“CALL:DTCHannel:DATA”](#).

Downlink Channel

When the RF generator frequency control (RF Gen Freq Ctrl) is set to auto, the downlink channel setting automatically adjusts the center frequency for the test set's RF generator based on the specified channel number. See [“CALL:CHANnel”](#).

RF Generator Frequency

To set a downlink frequency that does not correspond to a defined channel number, you can set the RF generator frequency control to manual. When manual RF generator control is used, the downlink channel (DL Channel) control is replaced by the RF generator frequency (RF Gen Freq Ctrl) control to allow manual entry of the RF generator frequency. See [“CALL\[:CELL\]:CONTROL:DOWNlink:FREQuency:AUTO”](#) and [“CALL\[:CELL\]:RFGenerator:FREQuency”](#).

Uplink Settings

Closed Loop Power Control Data

Closed loop power control data can be set using four formats: alternating (up/down) bits, all up bits, all down bits, 10 up bits & 10 down bits. See [“CALL:FDDTest:CLPControl:UPLink:MODE”](#).

Uplink Channel

When the test set is using automatic receiver control (the default), the uplink channel setting sets the test set's receivers to the expected UE uplink channel frequency. If manual receiver control is selected, the Measurement Frequency and Uplink Frequency settings are used to manually enter the receiver frequencies. See [“CALL:UPLink:CHANnel”](#). See also [“Receiver Control”](#) for information about automatic and manual receiver settings.

Uplink Scrambling Code

This setting tells the test set which scrambling code to use to decode the uplink signal from the UE (mobile station). *This setting must match the UE uplink scrambling code to make waveform quality and loopback bit error ratio measurements.* See [“CALL:UPLink:DPCHannel:SCODE”](#).

Receiver Control Settings

The expected power into the test set, and the frequency of the signal being measured, can be set either automatically or manually. Automatic receiver control is the default mode, and provides the simplest form of operation. Manual control is typically used to enter values that are different from those normally set during automatic control. See [“Receiver Control”](#) for more information on how manual and automatic receiver control are used.

Related Topics

[“CW Operating Mode”](#)

[“Receiver Control”](#)

[“Programming: Getting Started Guide for E1963A W-CDMA Mobile Test Application Revision A.01”](#)

CW Operating Mode

CW operating mode provides an unmodulated carrier of adjustable frequency and amplitude, manual adjustment of the measurement receiver and demodulation (uplink) receiver frequencies, and manual setting of the expected CW input power.

NOTE Manual receiver control settings made while using the CW operating mode can affect manual receiver settings made in other operating modes (such as FDD Test mode). When changing operating modes and using manual receiver settings, always verify that the manual receiver settings are correct for the new operating mode.

CW Test Mode Operation

When the test set's operating mode is set to CW:

- No over the air signaling is used. Therefore there is no synchronization between the mobile station (UE) and the test set.
- No demodulation or channel decoding is available.
- An unmodulated RF signal can be generated while analyzing another signal (at the same frequency or at a different frequency). No interaction exists between these controls.
- With the exception of mobile reported values (which are only available in Active Cell mode), all test set measurements are accessible. However, measurements requiring protocol triggering, such as waveform quality, cannot be made. Immediate triggering should be used for most measurements because no overhead signaling is occurring. Protocol triggering will time-out (if time-outs are enabled) or report an integrity indicator other than zero (0) and not provide valid results. RF Rise triggering is meant for burst signals, such as a PRACH burst, and may or may not work with other signals.
- Expected CW power, measurement receiver frequency, and uplink receiver frequency are available as manual settings only; no automatic control is provided.

CW Mode Operation

The following command examples show you how to control each function for CW operating mode:

1. Select CW operating mode:
OUTPUT 714;"CALL:OPERating:MODE CW"
2. Set the cell power output level to be transmitted by the test set:
OUTPUT 714;"CALL:POWer -45 DBM"
3. Set the RF generator frequency:
OUTPUT 714;"CALL:RFGenerator:FREQuency 870 MHZ"
4. Set the expected CW power level to be received by the test set:
OUTPUT 714;"RFANalyzer:CW:EXPEcted:POWer 23 DBM"
5. Set the measurement receiver frequency:
OUTPUT 714;"RFANalyzer:MANual:MEASurement 870.030 MHZ"

CW Operating Mode

6. Set the uplink (demodulation) receiver frequency. (Not typically used in CW operating mode):
OUTPUT 714;"RFANalyzer:MANual:UPLink 870.030 MHZ"

Related Topics

["FDD Test Operating Mode"](#)

["Receiver Control"](#)

Programming: Getting Started Guide for E1963A W-CDMA Mobile Test Application Revision A.01

Introduction

The Getting Started Guide is organized around the basic set of tasks a control program normally performs when testing a mobile station in a manufacturing environment.

Conventions used in this Getting Started Guide

Throughout this Getting Started Guide the term “test set” refers to an Agilent Technologies 8960 Series 10 wireless communications test set with the E1963A W-CDMA mobile test application installed.

The variable `Testset` used in the steps of the Getting Started Guide refers to the test set’s GPIB address.

How to use this Getting Started Guide

The most effective way to use this Getting Started Guide is with the Programming Flowchart included in the front inside pocket of this guide and the 8960 User Documentation. This documentation is found in two locations:

- the 8960 Family Support Site (updated frequently) on the Internet, or
- the User Documentation CD-ROM shipped with your test application.

Each step on the Programming Flowchart is illustrated with example program code in this guide. Using this Getting Started Guide, the Programming Flowchart, and the on-line information about 8960 programming, you will be able to generate a control program to perform fundamental mobile station manufacturing tests.

Useful on-line links

Go to the 8960 Family Support Site on either the CD-ROM or the Internet. The CD-ROM should self-launch to its home page. The URL for the website is:

<http://www.agilent.com/find/8960support/>

Navigate to the Programming page for this test application. The illustrations on the back of the Programming Flowchart show you how to navigate to this page.

The following links are under the heading Getting Started on the Programming page:

- Programming: Getting Started Guide
 - This online version of this guide contains links to more detailed information about each step which may be useful as you develop your control program.
- Control Program Examples
 - These examples are for you to download. You may want to use these as templates for your own control program or to execute.
 - The control program explained in the Getting Started Guide is also available here for you to download. It is a fully functional control program.

About the Programming Examples Presented in this Guide

Programming Language:

Programming examples presented in this guide are written in the HP BASIC programming language, also known as RMB or Rocky Mountain BASIC. The use of HP BASIC is not an endorsement of the HP BASIC product.

Line Numbers

All of the programming examples in the guide with line numbers are sections from a control program example available on-line for you to download.

Code that is not part of the download control program example does not have line numbers. This code may represent an alternate method of performing the task or may illustrate a feature not used by the control program example.

Syntax used in Programming Examples:

- The programming examples use the shortened form of the command syntax to minimize GPIB bus transactions. The shortened form of a command is defined by use of capital letters in the command syntax. For the command syntax:

```
RFANalyzer:CONTRol:MEASurement:FREQuency:AUTO?
```

the shortened form would be:

```
RFAN:CONT:MEAS:FREQ:AUTO?
```

- The programming examples do not include optional nodes. Optional nodes in the command syntax are defined by enclosing the node inside the [] brackets. For example, the command syntax:

```
CALL[:CELL]:POWer[:SAMPlitude] -80dBm
```

appears in the programming examples as:

```
CALL:POW -80dBm
```

- Programming examples make extensive use of compound commands using the ; and the ;; separators. Refer to the on-line information for the definition and use of these command separators.

Complex Commands

Complex commands are used to configure the state and assign values to parameters simultaneously. Complex commands can be used to save programming steps and minimize GPIB bus transactions.

- The syntax below turns the state of the parameter on.

```
OUTPUT Test_set;"SET:DTXP:TIM:STAT ON"
```

- The syntax below is used to assign a value to the parameter.

```
OUTPUT Test_set;"SET:DTXP:TIM:TIME 10 S"
```

- Both of the above actions can be accomplished with one syntax command:

```
OUTPUT Test_set;"SET:DTXP:TIM:STIM 10 S"
```

The command above sets the parameter state to ON and the value of the parameter to 10 seconds. Note that in this example the optional command mnemonic :STIME has been included to clarify that this complex command was used to set both the state and the value.

- This command can be shortened further by removing the optional command mnemonic :STIME, as shown below.

```
OUTPUT Test_set;"SET:DTXP:TIM 10 S"
```

This is the format that will be used throughout this guide.

Step 1: Set Up the Test Set

In this step you initialize the test set and set up general operating conditions.

- “Initialize the Test Set”
- “Set Up General Operating Conditions”

Initialize the Test Set

Fully Preset the Test Set

It is important to start each production session with the test set in a known state. Sending the *RST command resets all parameters to their default values, ends all measurement processes, and sets all measurement triggers to single.

Clear the Error Queue

At the start of each production session it is useful to clear the error queue so that you know any messages logged are relevant to the current production session.

Programming Example

```
250 ! Fully preset the test set
260 OUTPUT Testset;"*RST"
270 ! Clear the error queue
280 OUTPUT Testset;"*CLS"
```

Set Up General Operating Conditions

Turn Debugger On

The debugger is useful while you are developing code. When it is on, the test set alerts you when you send an incorrect command. You should turn it off once your code is complete.

Set Operating Mode

You must set the operating mode to FDD Test Mode.

Set Amplitude Offsets

You can account for path loss in your system by setting amplitude offsets. You can specify up to 20 frequency/amplitude pairs.

Programming Example

```
320 ! Turn debugger on
330 OUTPUT Testset;"SYST:COMM:GPIB:DEB ON"
340 ! Set operating mode to FDD Test Mode
350 OUTPUT Testset;"CALL:OPER:MODE FDDT"
360 ! Set amplitude offsets
370 OUTPUT Testset;"SYST:CORR:FREQ 800MHZ,900MHZ,1900MHZ,2000MHZ"
380 OUTPUT Testset;"SYST:CORR:SGA -0.7,-0.8,-1.0,-1.1"
```

Step 2: Configure Test Set and Mobile Station Parameters

In this step you configure the parameters that allow a connection to be made between the test set and user equipment.

- [“Set Up the Downlink”](#)
- [“Set Up the Uplink”](#)

Set Up the Downlink

Set Downlink Power

You must set the downlink power (cell power).

Set Downlink Frequency

You must set the frequency at which the downlink will transmit, by specifying either the channel or the frequency.

To specify the downlink channel, send the following command:

```
CALL:CHAN <>
```

If you choose to specify the downlink frequency rather than channel, you must first set control of the downlink output frequency to manual (automatic off), and then set the downlink frequency, as shown in the programming example below.

Set Downlink Primary Scrambling Code

You can set the downlink primary scrambling code.

Set Up Downlink Physical Channels

There are several downlink physical channels and an AWGN (Additive White Gaussian Noise) source which you can configure. You can set the power level of each physical channel (relative to cell power) and the absolute power level of the AWGN source. For some of the physical channels you can also specify the channelization code. You can specify the downlink DPCH type (12.2k RMC is the only option at this time) and data type (such as PRBS15).

Programming Example

```
470 ! Set downlink power
480 OUTPUT Testset;"CALL:POW ";Rf_level
490 ! Set downlink frequency
500 OUTPUT Testset;"CALL:CONT:DOWN:FREQ:AUTO OFF"
510 OUTPUT Testset;"CALL:RFG:FREQ 2.0 GHZ"
520 ! Set downlink primary scrambling code
530 OUTPUT Testset;"CALL:SCOD:PRIM 1"
540 ! Set up DPCH
550 OUTPUT Testset;"CALL:DPCH:TYP RMC12"
560 OUTPUT Testset;"CALL:DPCH:RMC12:CCOD CODE9"
570 OUTPUT Testset;"CALL:FDDT:DPCH -10.3"
```



```

580 OUTPUT Testset;"CALL:DTCH:DATA PRBS15"
590 ! Set up CPICH
600 OUTPUT Testset;"CALL:FDDT:CPIC -3.3"
610 ! Set up P-CCPCH
620 OUTPUT Testset;"CALL:FDDT:CCPC:PRIM -5.35"
630 ! Set up PICH
640 OUTPUT Testset;"CALL:PICH:CCOD CODE16"
650 OUTPUT Testset;"CALL:FDDT:PICH -8.35"
660 ! Set up AWGN
670 OUTPUT Testset;"CALL:AWGN:POW:STAT OFF"

```

Set Up the Uplink

Set Power Control Bits

You can specify which closed loop power control bit sequence is sent on the downlink DPCCH.

Set Expected Uplink Power

You must specify what uplink power level the test set should expect. You can do this one of two ways.

You can set the MS Target Power (once Active Cell mode is implemented in the test set, this command will force the user equipment to the specified output power. In FDD Test Mode, since the 8960 is not performing active closed loop power control of the uplink, this command does not change the user equipment's output power). Setting the MS Target Power automatically sets the receiver's expected power accordingly.

```
CALL:MS:POW:TARG <>
```

You can also set the receiver's expected power by setting control of the expected power to manual (automatic off) and then setting the expected power value, as shown in the programming example below.

Set Expected Uplink Frequency

You must indicate to the 8960 at what frequency the user equipment will transmit. (Unlike other technologies, in W-CDMA the uplink channel is not automatically determined based on the downlink channel. The offset between the uplink and downlink may vary based upon which band class you are operating in. So, you must specify the uplink frequency.) You can specify the expected uplink frequency by channel or by frequency.

To specify the expected uplink channel, send the following command:

```
CALL:UPL:CHAN <>
```

If you choose to specify the frequency rather than the channel, you must first set control of the expected frequency to manual (automatic off), and then set the uplink frequency, as shown in the programming example below.

For some testing scenarios you may choose to perform measurements on a frequency other than that which the user equipment is using for its signaling link. To accommodate this, in addition to the commands to set expected uplink channel or frequency, there is a command to set the measurement frequency. To set the measurement frequency you must set measurement frequency control to manual (automatic off) and then set the measurement frequency, as shown in the programming example below. This is only necessary if you want to perform measurements on a frequency other than the uplink channel or frequency.

Set Expected Uplink Primary Scrambling Code

You must indicate to the 8960 what primary scrambling code the user equipment is using.

Step 2: Configure Test Set and Mobile Station Parameters

Programming Example

```
710 ! Set power control bits to all up to force UE to max power
720 OUTPUT Testset;"CALL:FDDT:CLPC:UPL:MODE UP"
730 ! Set expected uplink power
740 OUTPUT Testset;"RFAN:CONT:POW:AUTO OFF"
750 OUTPUT Testset;"RFAN:MAN:POW:FDD 0"
760 ! Set expected uplink frequency and measurement frequency
770 OUTPUT Testset;"RFAN:CONT:UPL:FREQ:AUTO OFF"
780 OUTPUT Testset;"RFAN:MAN:UPL:FREQ 1.9 GHZ"
790 OUTPUT Testset;"RFAN:CONT:MEAS:FREQ:AUTO OFF"
800 OUTPUT Testset;"RFAN:MAN:MEAS:FREQ 1.9 GHZ"
810 ! Set expected uplink primary scrambling code
820 OUTPUT Testset;"CALL:UPL:DPCH:SCOD 0"
```

Step 3: Set Measurement Parameters

In this step you set up measurement parameters. This configures the measurements so that they are ready to execute in step 5.

Many of the measurements have only generic measurement parameters available, such as measurement count, timeout, trigger arm and trigger source.

There is a command available to set all measurement triggers to single (SET:CONT:OFF), which is the recommended trigger arm configuration for remote use of the test set. However, if you sent the *RST command in step 1, all measurement triggers will already be set to single.

Some measurements have measurement-specific parameters available. Consult the programming reference material available on the Internet to find out more about measurement-specific parameters.

Programming Example

```
880  ! Set all measurement triggers to single
890  OUTPUT Testset;"SET:CONT:OFF"
900  ! Set up thermal power
910  OUTPUT Testset;"SET:WTP:TIM 3;COUN 1"
920  ! Set up channel power
930  OUTPUT Testset;"SET:WCP:TIM 3;COUN 1;TRIG:SOUR IMM"
940  OUTPUT Testset;"SET:WCP:INT:TIME 10 MS"
950  ! Set up waveform quality
960  OUTPUT Testset;"SET:WWQ:TIM 3;COUN 1;TSL 1"
970  ! Set up ACLR
980  OUTPUT Testset;"SET:WACL:TIM 3;COUN 1;TRIG:SOUR IMM"
990  ! Set up Loopback BER
1000 OUTPUT Testset;"SET:WBER:TIM 10;COUN 15000"
```

Step 4: Make a Connection

In this step you establish communication between the test set and user equipment such that measurements can be made.

When the test set is operating in FDD Test Mode, you do not send any commands to the test set for this step. From the previous steps, the test set should already be properly configured and transmitting its downlink signal so that the user equipment can detect and synchronize to it. In this step you either implement a pause in your program and wait for the user equipment to be manually configured and begin transmitting, or send appropriate test mode commands to configure the user equipment and begin its transmission.

During this step, the user equipment must begin transmission of a 12.2k RMC DPCH at the proper power level, frequency and primary scrambling code. It must be synchronized to the test set for waveform quality and transmit in loopback mode 1 for loopback BER.

Programming Example

```
1060 PRINT "Configure UE for 12.2k RMC Now."
1070 PRINT
1080 PRINT "UE Synchronization required for Waveform Quality."
1090 PRINT "UE loopback Mode 1 required for loopback BER."
1100 PRINT
1110 PRINT "8960 DL is 2.0 GHz"
1120 PRINT "8960 UL Expected Frequency: 1.9 GHz"
1130 PRINT "8960 UL Expected Power: 0 dBm"
1140 PRINT "8960 UL Expected Primary Scrambling Code: 0"
1150 PRINT
1160 PRINT "When UE is configured and transmitting, press `F2`."
1170 PAUSE
```

Step 5: INITiate and FETCh Measurements

In this step you INITiate measurements, FETCh the results, and verify the results are valid.

- “INITiate a Set of Concurrent Measurements”
- “FETCh Measurement Results”

INITiate a Set of Concurrent Measurements

The test set is capable of performing concurrent measurements. To start the measurement process you INITiate a set of concurrent measurements.

FETCh Measurement Results

To retrieve measurement results as they complete, you must set up a loop using the INIT:DONE? query. Depending upon the output of the query, the program will either wait for a measurement to complete, FETCh the result of a completed measurement, or continue the program once all measurements are complete. Once a measurement result is FETChed, you should check its integrity indicator to verify that the result is valid.

Programming Example

```

1280 ! INITiate a set of concurrent measurements
1290   OUTPUT Testset;"INIT:WTP;WWQ;WACL;WBER"
1300 ! FETCh the measurement results (using a subroutine)
1310   Fetch_results

1780 SUB Fetch_results
1790   REPEAT
1800 ! Determine if any measurements are done
1810   OUTPUT 714;"INIT:DONE?"
1820   ENTER 714;Measdone$
1830   SELECT Measdone$
1840   CASE "WTP"
1850 ! FETCh measurement result
1860   OUTPUT 714;"FETC:WTP:INT?;POW?"
1870   ENTER 714;Integrity,Power
1880 ! Verify measurement result is valid
1890   IF Integrity=0 THEN
1900 ! For valid result, print result to screen (using a subroutine)
1910   Print_results(Measdone$,Power)
1920   ELSE
1930 ! For invalid result, invoke error handler (using a subroutine)
1940   Meas_error(Measdone$,Integrity)
1950   END IF
1960   CASE "WCP"
1970   OUTPUT 714;"FETC:WCP:INT?;POW?"
1980   ENTER 714;Integrity,Power
1990   IF Integrity=0 THEN
2000   Print_results(Measdone$,Power)
2010   ELSE

```

Step 5: INITiate and FETCh Measurements

```
2020     Meas_error(Measdone$, Integrity)
2030     END IF
2040     CASE "WWQ"
2050         OUTPUT 714;"FETC:WWQ?"
2060         ENTER 714;Integrity,Evm,Ferr,Ooff,Perr,Merr
2070         IF Integrity=0 THEN
2080             Print_results(Measdone$,Evm,Ferr,Ooff,Perr,Merr)
2090         ELSE
2100             Meas_error(Measdone$, Integrity)
2110         END IF
2120     CASE "WACL"
2130         OUTPUT 714;"FETC:WACL:INT?;AVER?"
2140         ENTER 714;Integrity,Negfive,Posfive,Negten,Posten
2150         IF Integrity=0 THEN
2160             Print_results(Measdone$,Negfive,Posfive,Negten,Posten)
2170         ELSE
2180             Meas_error(Measdone$, Integrity)
2190         END IF
2200     CASE "WBER"
2210         OUTPUT 714;"FETC:WBER?;WBER:INT?"
2220         ENTER 714;Ber,Integrity
2230         IF Integrity=0 THEN
2240             Print_results(Measdone$,Ber)
2250         ELSE
2260             Meas_error(Measdone$, Integrity)
2270         END IF
2280     END SELECT
2290 ! Exit loop when all measurements are complete
2300     UNTIL Measdone$="NONE"
2310 SUBEND
```

Step 6: Reconfigure Test Set and Mobile Station Connection Parameters

In this step you change characteristics of the link between the test set and user equipment.

For example, to change the uplink frequency, you must pause the program to wait for the user equipment to be configured to transmit at the new frequency. You must also change the expected uplink frequency and measurement frequency accordingly, as shown in the programming example below.

If you change the test set configuration, such as downlink frequency or primary scrambling code, you must configure the test set and then allow the user equipment to find the new configuration and synchronize to it before proceeding with measurements.

Programming Example

```
1410     PRINT "Change UE UL Frequency to 1.850 GHz."
1420     PRINT
1430     PRINT "UE Synchronization required for Waveform Quality."
1440     PRINT "UE loopback Mode 1 required for loopback BER."
1450     PRINT
1460     PRINT "When UE is configured and transmitting, press `F2`."
1470     PAUSE
1480 ! Change expected uplink frequency
1490     OUTPUT Testset;"RFAN:MAN:MEAS:FREQ 1.85 GHZ"
1500     OUTPUT Testset;"RFAN:MAN:UPL:FREQ 1.85 GHZ"
```

Step 7: End the Connection

In this step you end the communication between the test set and user equipment, and prepare for the next program action.

Once you have ended the user equipment transmission, to prepare for testing the next user equipment, you should partially preset the test set. This stops all measurement processes but does not reset all parameters to their default values. That way you do not need to reset the parameters which are constant for all user equipment in the test batch.

Programming Example

```
1630 PRINT "Testing complete, end UE transmission."  
1640 ! Partially preset the test set  
1650 OUTPUT Testset;"SYST:PRES3"
```

Step 1: Set Up the Test Set

The following information provides additional details on Step 1 of the Programming Flowchart. This information is applicable to all test applications.

Description

In this step you initialize the test set and set up the general operating conditions.

Contents

- “Initialize the Test Set”
- “Set Up General Operating Conditions”

Initialize the Test Set

- Fully Preset the Test Set

It is important to get the test set to a known state before each production session.

Sending the *RST command fully presets the test set, which ends all call processing and measurement processes and restores all values to defaults.

- Clear the Error Queue

Before each production session, it is useful to clear the error queue of any old messages. That way, you know that any messages logged are relevant to the current production session.

Sending the *CLS command clears the error queue.

Set Up General Operating Conditions

- Turn Debugger On

While developing your code, it is very useful to enable the GPIB debugger using the SYST:COMM:GPIB:DEB ON command. When the debugger is on, the test set alerts you when you send an incorrect command, and it also tells you which symbol or letter in the command is incorrect.

NOTE You should turn the debugger off once you have finished development and your code is stable.

- Set Operating Mode

The test set contains a base station emulator (BSE), whose primary purpose is to provide enough call processing to allow parametric measurements of a mobile station's RF signal.

An important characteristic of the test set's base station emulator is its operating mode. The operating mode sets the way in which the base station emulator interacts with the mobile station.

Active cell mode is used when emulating a normal cell. Active cell mode allows active signaling between the mobile station and BSE. The mobile station camps to the BSE signal, and an actual call is established.

In test mode, the mobile station synchronizes to the BSE signal and transmits an appropriate signal which the test set analyzes.

Step 1: Set Up the Test Set

The test set's operating mode is set using the following command:

Command to Set the Test Set's Operating Mode

Command	Example
CALL:OPER:MODE <operating mode>	CALL:OPER:MODE CELL

- Set Amplitude Offsets

To achieve accurate measurement results, it is important to account for losses in the cabling and fixturing between the mobile station and test set. You must determine what the losses are for your test setup and then specify the appropriate frequency-dependent amplitude offset values.

You can specify amplitude offsets for up to 20 frequencies using the following commands:

Commands to Set Amplitude Offsets

Command	Example
SYST:CORR:FREQ <freq1>, <freq2>, <freq3>	SYST:CORR:FREQ 800MHz, 1800MHz, 1900MHz
SYST:CORR[:SGain] <offset1>, <offset2>, <offset3>	SYST:CORR -0.7, -1.0, -1.2

- Set Display Mode

To achieve a slightly faster test execution speed, you can disable the front panel display on the test set using the DISP:MODE FAST command.

Step 2: Configure Test Set and Mobile Station Parameters

The following information provides additional details on Step 2 of the Programming Flowchart. This information is applicable to all test applications.

Description

In this step you configure the parameters that allow a connection to be made between the test set and mobile station. This mainly involves setting up channels and power levels.

Contents

- “Set Up Channels”
- “Set Cell Power”
- “Set Mobile Station Transmit Power”
- “Set Up Additional Connection Parameters”

Set Up Channels

Setting up channels involves specifying the channel associated with every band and channel type (for example, analog or digital), and then setting the active band and channel type.

- Specify Channel Numbers

All of the test set's test applications can test in more than one frequency band (for example, US Cellular, US PCS, or Korean PCS). To produce the most efficient code, you should configure the channel information for each band in advance. Then, to move to a new band during testing, you only need to send the command to change bands. You do not need to also specify the channel of the new band. This reduces test time.

To set up the channel number for the various bands, use one of the following commands (depending upon which test application you are using):

Commands to Set the Channel for a Band

Command	Example
CALL:<channel mnemonic>:<band mnemonic> <num value>	CALL:TCH:EGSM 124
CALL:SET:<channel type mnemonic>:<band mnemonic> <num value>	CALL:SET:DTC:PCS 777
CALL:CHAN:<channel type mnemonic>:<band mnemonic> <num value>	CALL:CHAN:DIG2000:K PCS 384

Step 2: Configure Test Set and Mobile Station Parameters

This practice also applies to test applications which test both analog and digital channel types. In this case you should specify the channel for the analog and digital channel types in advance. Then, switching between them requires only one command to initiate the change, and not an additional change to specify the channel of the new channel type.

If you specify channels in advance as described, the only time you need to specify a channel during testing is if you move to a new channel within the same band and channel type.

- **Set Active Band and Mode**

Once you have specified the channel information for each band and channel type, you must set the active band using one of the following commands (depending upon which test application you are using):

Commands to Set the Active Band

Command	Example
CALL:<channel mnemonic>:BAND <band mnemonic>	CALL:TCH:BAND EGSM
CALL:SET:<channel type mnemonic>:BAND <band mnemonic>	CALL:SET:DTC:BAND PCS
CALL:BAND:<channel mnemonic> <band mnemonic>	CALL:BAND:DIG2000 KPCS

If the test application you are using supports testing of both analog and digital channel types, then you must also set the channel type using the following command:

Command to Set the Active Channel Type

Command	Example
CALL:<channel mnemonic>:TYPE <channel type mnemonic>	CALL:TCH:TYPE DTC

- **Active Cell and Test Mode Considerations**

The function of the CALL commands differ depending upon whether you are in active cell or test mode.

In active cell mode, when you use the CALL commands to set the channel numbers, the test set's output frequency and receiver frequency are set. A message is also sent to the mobile station to set its frequency.

However, in test mode, since the BSE does not send call processing information to the mobile station, the CALL commands only configure the test set's output frequency and receiver frequency. You need to also send the appropriate test mode commands to the mobile station to set it to the correct frequency.

In test mode, instead of using the CALL commands to configure the test set's frequencies, you may prefer to manually control the RF generator and RF analyzer using the CALL:RFG and RFAN commands, respectively. In either case, you must still send the appropriate test mode commands to the mobile station to move it to the proper frequency.

Set Cell Power

To set the output power of the test set, use the following command:

Command to Set Cell Power

Command	Example
CALL:POW <num value>	CALL:POW -75

- Active Cell and Test Mode Considerations

You can use the CALL:POW command to set the cell power in both active cell and test mode. However, in test mode you may prefer to manually control the output power of the test set using the CALL:RFG commands.

Set Mobile Station Transmit Power

In active cell mode, use one of the following commands to set the mobile station transmit power level (depending upon which test application you are using):

Commands to Set Mobile Station Transmit Power

Command	Example
CALL:MS:TXL:<band mnemonic> <num value>	CALL:MS:TXL:DCS <num value>
CALL:SET:MS:<channel type mnemonic>:TXL:<band mnemonic> <num value>	CALL:SET:MS:DIG:TXL:PCS <num value>
CALL:<channel mnemonic>:MS:TXL:<band mnemonic>:BURS <num value>	CALL:PDTCH:MS:TXL:DCS: BURS <num value>

In addition to setting the mobile station transmit level, these commands also automatically configure the test set's receiver at the expected input level, whether in active cell or test mode. However, in test mode, you must also send the appropriate test mode commands to the mobile station to command it to output at the correct level. This is due to the fact that the BSE is not transmitting call processing commands to the mobile station.

- Manually Setting Expected Power

Sending the CALL commands in [Table , "Commands to Set Mobile Station Transmit Power,"](#) automatically sets the expected input level of the test set's receiver. However, there is another option for setting the receiver's input level in both active cell and test mode. It is often beneficial to manually set the expected input power level using the RFAN commands, rather than using the CALL commands.

When you set the expected power manually, you tell the test set exactly what power level to expect. Whereas the CALL commands simply tell the test set the range of input level to expect, based on the definition of the mobile station power level (for example, an AMPS/136 mobile station transmitting at power level 3 has an output level in the range of +20 dBm to +26 dBm).

Step 2: Configure Test Set and Mobile Station Parameters

Set Up Additional Connection Parameters

Depending upon the test application you are using, there may be other connection parameters to specify, such as timeslot, timing advance, vocoder, or data rates and types.

In active cell mode, you may also choose to set up network parameters, such as base station identifier numbers (for example, SID) and color codes.

All of these parameters are configured using the CALL subsystem.

Step 3: Set Measurement Parameters

The following information provides additional details on Step 3 of the Programming Flowchart. This information is applicable to all test applications.

Description

In this step you set up the conditions under which the measurements operate. You do this by configuring measurement parameters.

Contents

- [“Measurement Parameters Overview”](#)
- [“Generic Measurement Parameters”](#)
- [“Measurement-Specific Measurement Parameters”](#)

Measurement Parameters Overview

There are two different types of measurement parameters:

- Generic Measurement Parameters
- Measurement-Specific Measurement Parameters

The SETup subsystem is used to configure measurement parameters. Each individual measurement parameter can be set and queried using the associated SETup subsystem command. The general hierarchy of the SETup subsystem command structure is as follows:

```
SETup:<measurement mnemonic>:<measurement parameter> <parameter setting/value>
```

NOTE Not all measurements use all measurement parameters. Refer to the GPIB syntax listing for the detailed list of measurement parameters for individual measurements.

Step 3: Set Measurement Parameters

Generic Measurement Parameters

There are three types of generic measurement parameters:

- Measurement Count (used by most measurements)
Measurement Count State
Measurement Count Number
- Measurement Timeout (used by all measurements)
Measurement Timeout State
Measurement Timeout Time
- Measurement Trigger (used by most measurements)
Trigger Arm (used by all measurements)
Trigger Source (not applicable to analog measurements)
Trigger Delay (not applicable to analog measurements)

Measurement Count Parameters

The measurement count parameters control measurement averaging. The STATE command turns averaging on or off, and the NUMBER command determines the number of averages. The SNUMBER command is a complex command which allows you to turn averaging on and set the number of averages in one command.

Statistical Measurement Results Parameters

Parameter	Command Syntax
Measurement Count State	SETup:<meas-mnemonic>:COUNT:STATE <ON 1 OFF 0>
Measurement Count Number	SETup:<meas-mnemonic>:COUNT:NUMBER <numeric value>
Measurement Count Number and State	SETup:<meas-mnemonic>:COUNT[:SNUMBER] <numeric value>

Example 1. Programming Example:

```
OUTPUT Test_set;"SET:DTXP:COUN 10"
```

sets the multi-measurement count state to ON and set the number of averages to 10 for the digital transmit power measurement.

Measurement Timeout Parameters Measurement timeout parameters control the maximum time that a measurement executes. TIME sets the amount of time and STATE determines if the timeout is in use. The STIME command is a complex command which enables you to set both parameters in one command.

Measurement Timeout Parameters

Parameters	Command Syntax
Measurement Timeout Time and State	SETup:<meas-mnemonic>:TIMEout[:STIME] <numeric value>[<suffix>]
Measurement Timeout State	SETup:<meas-mnemonic>:TIMEout:STATE <ON 1 OFF 0>
Measurement Timeout Time	SETup:<meas-mnemonic>:TIMEout:TIME <numeric value>[<suffix>]

Example 2. Programming Example:

```
OUTPUT Test_set;"SET:DTXP:TIM 10"
```

sets the measurement timeout state to ON and set the measurement timeout time to 10 seconds for the digital transmit power measurement.

Measurement Trigger Parameters There are three measurement trigger parameters. They control the arming of a measurement, the source of the trigger, and the trigger's delay.

- The trigger arm parameter determines whether the test set makes one measurement and then stops (single), or automatically re-arms upon completion of one measurement and repeats the process (continuous). The recommended setting when writing a control program is single (CONTinuous OFF).
- The trigger source parameter selects the source of the measurement trigger signal. The recommended Trigger Source setting when writing a control program is AUTO.

NOTE Trigger source is always IMMEDIATE for analog measurements and cannot be changed by the user.

- The trigger delay parameter controls the delay between the trigger event (the point in time at which the trigger signal is received) and the start of sampling. Negative values indicate that the sampling should occur prior to the trigger event.

NOTE Trigger delay is not applicable to analog measurements.

Measurement Trigger Parameters

Parameter	Command Syntax
Trigger Arm	SETup:<meas-mnemonic>:CONTinuous <ON 1 OFF 0>
Trigger Source	SETup:<meas-mnemonic>:TRIGger:SOURce <AUTO IMMEDIATE PROTOCOL RISE>
Trigger Delay	SETup:<meas-mnemonic>:TRIGger:DELay <numeric value>[<suffix>]

NOTE You can set the Trigger Arm for all measurements to single (CONTInuous OFF) using the following command syntax:

```
SETup[ :ALL ]:CONTInuous:OFF
```

Example 3. Programming Example:

```
OUTPUT Test_set;"SET:CONT:OFF"
```

sets the trigger arm to single for all measurements.

Example 4. Programming Example:

```
OUTPUT Test_set;"SET:DTXP:TRIG:SOUR AUTO"
```

sets the trigger source to AUTO for the digital transmit power measurement.

Example 5. Programming Example:

```
OUTPUT Test_set;"SET:DTXP:TRIG:DEL 10 US"
```

sets the trigger delay to 10 microseconds for the digital transmit power measurement.

Measurement-Specific Measurement Parameters

Measurement-specific measurement parameters set up operating conditions for a specific measurement. For example:

- Setting the channel power measurement speed in IS-2000
- Setting ORFS frequency offsets in GPRS
- Setting number of bits for the FBER measurement in GSM

Refer to the GPIB syntax listing for the detailed list of measurement parameters for individual measurements.

Example 6. Programming Example:

```
OUTPUT Test_set;"SET:CPOW:MSP FAST"
```

sets the IS-2000 channel power measurement speed to fast.

Example 7. Programming Example:

```
OUTPUT Test_set;"SET:ORFS:SWIT:FREQ 400 KHZ"
```

sets the first ORFS offset to 400 kHz.

Example 8. Programming Example:

```
OUTPUT Test_set;"SET:FBER:COUN 10000"
```

sets the number of fast BER bits to test to 10,000 bits.

Example 9. Program Example Setting Both Generic and Measurement-Specific Measurement Parameters

```

! Set trigger arm to single for all measurements:
!
OUTPUT Test_set;"SET:CONT:OFF"
!
! *****
! Configure Modulation Accuracy Measurement:
!
OUTPUT Test_set;"SET:MACC:COUN 5"
! Example of using a complex command to set both the
! measurement count state and number at the same time.
!
OUTPUT Test_set;"SET:MACC:TRIG:SOUR AUTO"
! Sets trigger source to auto.
!
OUTPUT Test_set;"SET:MACC:TIM 15"
! Sets timeout state to ON and time to 15 sec.
!
OUTPUT Test_set;"SET:MACC:EVM10:STAT ON"
! Turns the EVM10 State ON
!
! *****
! Configure Digital TX Power Measurement:
!
OUTPUT Test_set;"SET:DTXP:COUN 5"
OUTPUT Test_set;"SET:DTXP:TRIG:SOUR AUTO"
OUTPUT Test_set;"SET:DTXP:TIM 5"
!
! *****
! Configure Frequency Stability Measurement:
!
OUTPUT Test_set;"SET:FST:COUN 3"
OUTPUT Test_set;"SET:FST:TIM 10"
!
! *****
! Configure Analog TX Power Measurement:
!
OUTPUT Test_set;"SET:ATXP:COUN 5"
OUTPUT Test_set;"SET:ATXP:TRIG:SOUR AUTO"
OUTPUT Test_set;"SET:ATXP:TIM 15"

```

Step 4: Make Connection

The following information provides additional details on Step 4 of the Programming Flowchart. This information is applicable to all test applications.

Description

In this step you make a connection between the mobile station and test set. How you do this depends upon whether you are in active cell or test mode. In active cell mode you establish a phone call between the test set and mobile station. In test mode, you command the mobile station to synchronize to the test set's signal and begin transmitting back an appropriate signal.

Contents

- [“Establish a Call in Active Cell Mode”](#)
- [“Make a Test Mode Connection”](#)

Establish a Call in Active Cell Mode

To test a mobile station in active cell mode, you must first establish a call between the test set and mobile station. Your control program must issue the commands necessary to initiate the call connection process, either to the test set (for a base station originated call) or to the mobile station (for a mobile station originated call). Your control program must then determine when the call has successfully connected so that it can proceed to testing. The control program must also determine if the call has not been successfully connected so that it can take appropriate action.

Call States At any instant in time a call can be in a stable state such as the idle or the connected state, or in one of many transitory states such as alerting, handoff, registering, releasing or paging. These are referred to as transitory states because the amount of time which the call can spend in any of these states is limited by the mobile station's protocol. The call is not allowed to stay in a transitory state indefinitely.

NOTE If repeat paging or repeat registration are on, it is possible for the call process to stay in one of the transitory states beyond the time specified by the mobile station's protocol timers.

Call Connection Synchronization Commands The test set has a set of commands designed specifically for call connection and release synchronization.

Call Connection Synchronization Commands

Synchronization Command	Command Syntax
Call-Connected-State Query	CALL:CONNected[:STATe]?
Call-State-Change Detector Arm	CALL:CONNected:ARM[:IMMediate]
Call-State-Change Detector Timeout	CALL:CONNected:TIMEout

- Call-Connected-State Query

The CALL:CONN? query allows the control program to determine if a call is in the connected state or in the idle state.

Responses Returned by the CALL:CONN? Query

Response	Meaning
1	The call is in the connected state.
0	The call is in the idle state.

If the call is in one of the transitory states, the query waits until the call reaches the idle state or connected state before returning a value.

- Call-State-Change Detector Arm Command

The test set has a call-state-change detector which can be used to temporarily hold the response to a CALL:CONN? query until the call state has moved from idle to connected or vice versa.

Without the call-state-change detector, the CALL:CONN? query only hangs if the call is in a transitory state. Otherwise, it immediately returns a 1 or 0. Therefore, if a call connection process is started and the CALL:CONN? query is sent before the call state has transitioned from idle to one of the transitory states, the query immediately returns a 0. This indicates that the call is in the idle state (and therefore that the connection attempt failed). In reality, the call likely connected, but not until after the CALL:CONN? query immediately returned a 0.

When the call-state-change detector is armed during a connection attempt, if the CALL:CONN? query is sent while the call state is still idle, the query waits until the state changes to connected, and then returns a 1.

The CALL:CONNected:ARM[:IMMediate] command is used to arm this call-state-change detector.

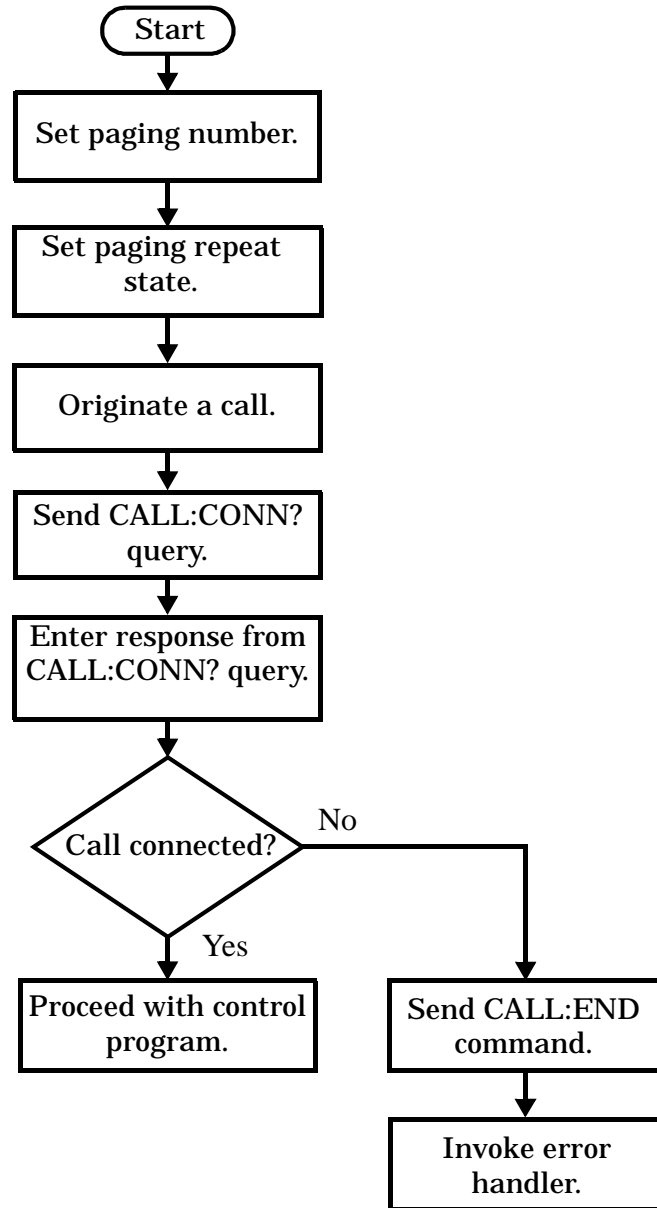
- Call-State-Change Detector Timeout Command

If the call-state-change detector is armed and a call connection is attempted but the call state never changes from the idle state, the CALL:CONN? query hangs the bus. This easily happens if the mobile is badly broken, the mobile is not connected to the test set, or no one pushes the send button on the mobile.

The CALL:CONNected:TIMEout command is used to set the timeout value for the call-state-change detector.

The timeout timer is started whenever the call-state-change detector is armed, and should be set to the maximum amount of time the control program should wait between arming the detector and the beginning of the connection process (when the call state moves from the idle state). If the timer expires before the call state has moved from the idle or connected state, the call-state-change detector is disarmed, which releases the CALL:CONN? query if it is currently hanging.

Process for Making a Base Station Originated Call Figure 5. Process for Making a Base Station Originated Call



NOTE It is not necessary for you to send the CALL:CONN:TIM and CALL:CONN:ARM commands as they are automatically sent by the test set during a base station originated call or base station release.

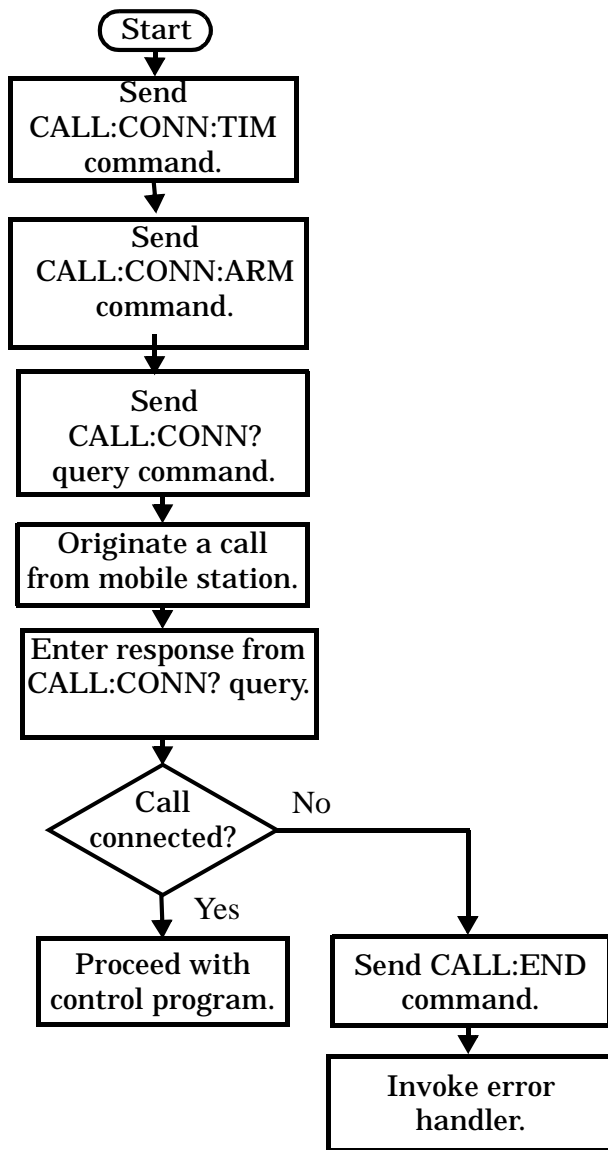
Example 10. Programming Example

```

OUTPUT Test_set;"CALL:PAG:PNUM `0000574016`"! Set paging number
OUTPUT Test_set;"CALL:PAG:REP ON" ! Set paging repeat state
OUTPUT Test_set;"CALL:ORIG" ! Start a base station originated call
OUTPUT Test_set;"CALL:CONN?" ! Hanging GPIB query
ENTER Test_set;Call_connected ! Program hangs here until
                                ! origination passes or fails

IF NOT Call_connected THEN
    OUTPUT Test_set;"CALL:END"
! <put error handler here>
END IF
! Call is connected so proceed with control program
    
```

Process for Making a Mobile Station Originated Call Figure 6. Process for Making a Mobile Station Originated Call



NOTE The test set cannot originate a call from the mobile station. You must physically dial a number on the mobile station and press send, or send commands to a test bus built into the mobile station. For mobile station originated calls where the call is originated by physically dialing a number (as opposed to using a test bus) ensure that the call-state-change detector timeout time is long enough to allow the number to be dialed.

Example 11. Programming Example

```
OUTPUT Test_set;"CALL:CONN:TIM 10"           ! Set timeout time to 10 seconds
OUTPUT Test_set;"CALL:CONN:ARM"             ! Arm the change detector
DISP "Initiate a call from the mobile"
OUTPUT Test_set;"CALL:CONN?"                ! Initiate a call connected state query
ENTER Test_set;Call_connected               ! Program hangs here until
                                           ! origination passes or fails

IF NOT Call_connected THEN
    OUTPUT Test_set;"CALL:END"
! <put error handler here>
END IF
! Call is connected. Proceed with the control program.
```

Make a Test Mode Connection

To make a connection between the test set and mobile station in test mode, you must send the appropriate test mode commands to the mobile station to command it to synchronize to the test set's signal and begin transmitting.

You may also want to make a quick power measurement to ensure that the connection has been made.

Step 5: INITiate and FETCh Measurements

The following information provides additional details on Step 5 of the Programming Flowchart. This information is applicable to all test applications.

Description

This step involves making measurements on the mobile station.

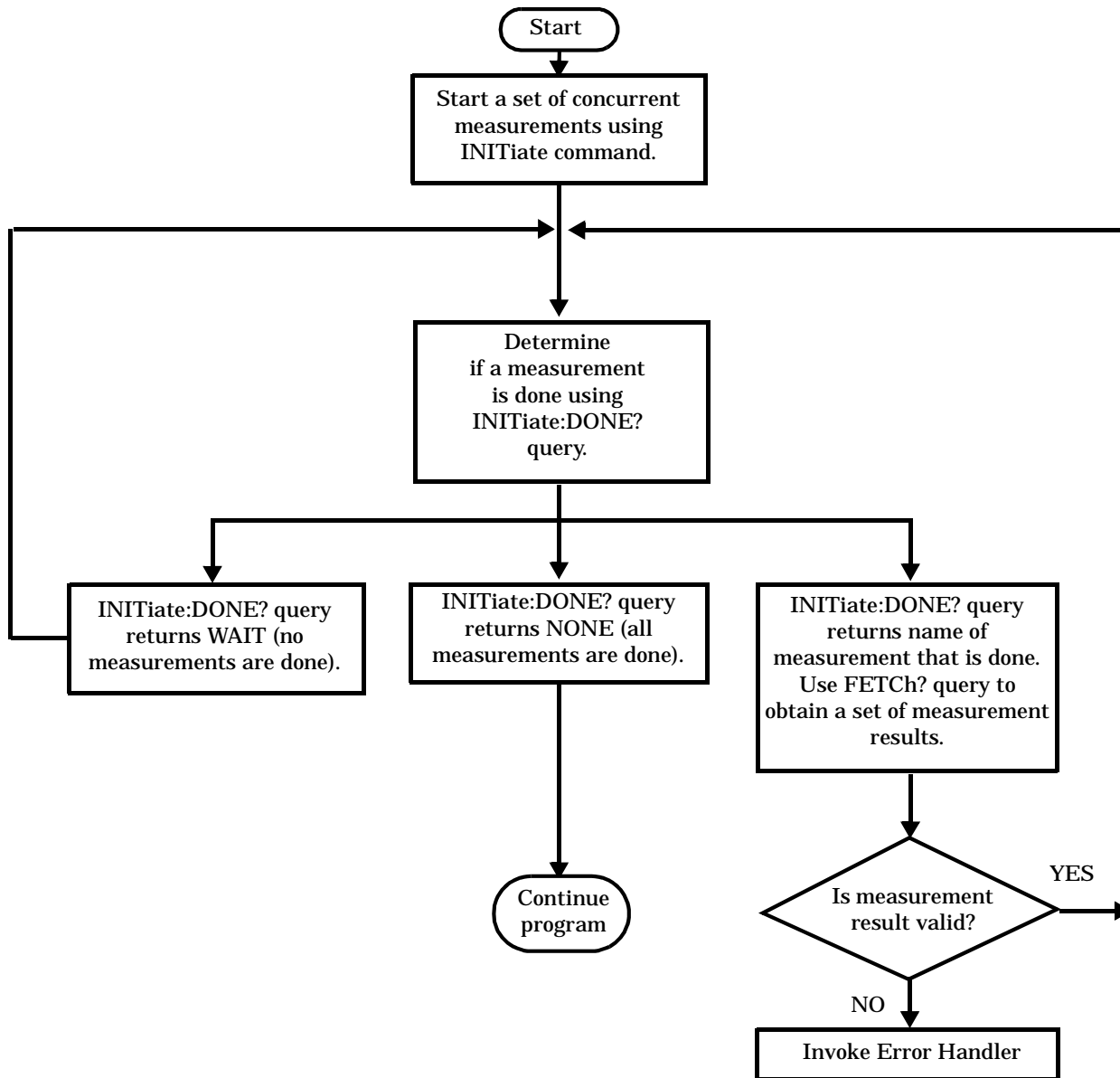
The test set has multiple signal paths and processors, which means you can make measurements concurrently and reduce test time. Making concurrent measurements involves starting a group of measurements, fetching the results of the measurements as they complete, and then verifying that the results are valid.

Contents

- [“Concurrent Measurement Process”](#)
- [“Alternative Measurement Process”](#)

Concurrent Measurement Process

Figure 7. Process for Making Concurrent Measurements



Start a Set of Concurrent Measurements The INITiate command is used to start measurements. Each individual measurement can be started using the INITiate command. For starting measurements, the syntax of the INITiate command is as follows:

INITiate:<measurement mnemonic>[:ON]

More than one measurement can be started using a single INITiate command. For example:

```
OUTPUT Test_set;"INIT:TXP;PFER"
```

starts the transmit power measurement and the phase and frequency error measurement. These measurements then run concurrently.

Determine if a Measurement Is Done Use the INITiate:DONE? query command to determine which measurement has completed.

This command is a query only and returns only one response per query. The responses returned and their meanings are shown in the following table:

Table 1. Responses Returned from INITiate:DONE? Query

Response String	Meaning
<MEASUREMENT1 mnemonic>	MEASUREMENT1 is done.
<MEASUREMENT2 mnemonic>	MEASUREMENT2 is done.
WAIT	There are one or more measurements that are in progress, but none of those measurements are done yet.
NONE	No measurements are in progress.

Once a measurement is reported as being complete via the INITiate:DONE? query it is removed from the done list (it is not reported again). To use the INITiate:DONE? query properly, your control program should immediately fetch a measurement's results once it is reported as being complete.

Obtain a Set of Measurement Results In order to minimize bus traffic and reduce test time, the test set's measurements are designed to return multiple measured values in response to a single measurement request.

For example, if a transmit power measurement with averaging is initiated there are five measurement results available. These are:

1. Measurement integrity value
2. Average value
3. Minimum value
4. Maximum value
5. Standard deviation value

The test set can return the measurement results in a variety of formats to suit your needs using the FETCh? subsystem. The general structure of the FETCh? command is as follows:

```
FETCh:<measurement mnemonic>:<result format>?
```

For example, the transmitter power measurement results can be returned as:

Example FETCh? Result Formats

Command	Results Returned
FETC:TXP?	Measurement integrity and average value
FETC:TXP:POW:ALL?	Minimum, maximum, average and standard deviation values

Step 5: INITiate and FETCh Measurements

Example FETCh? Result Formats

Command	Results Returned
FETC:TXP:POW:AVER?	Average value only
FETC:TXP:POW:MIN?	Minimum value only
FETC:TXP:POW:MAX?	Maximum value only
FETC:TXP:POW:SDEV?	Standard deviation value only
FETC:TXP:INT?	Measurement integrity value only

Example 12. Concurrent Measurement Process Programming Example

```
! Start a Set of Concurrent Measurements:
!
OUTPUT Test_set;"INIT:TXP;PFER"
!
! Determine if a Measurement Is Done:
!
LOOP
  OUTPUT Test_set;"INIT:DONE?"
  ENTER Test_set;Meas_done$
!
! Obtain a Set of Measurement Results:
!
SELECT Meas_done$
  CASE "TXP"
    OUTPUT Test_set;"FETC:TXP:POW?"
    ENTER Test_set;Avg_tx_power
  CASE "PFER"
    OUTPUT Test_set;"FETC:PFER:RMS?"
    ENTER Test_set;Max_rms_phas_er
END SELECT
EXIT IF Meas_done$="NONE"
END LOOP
```

Validate Measurement Results Validating measurement results is extremely important. The test set returns a result if it is capable of making a measurement, even if this result is obtained under adverse conditions.

The measurement integrity indicator is a measurement result and therefore is queried using the FETCh subsystem. A value of 0 indicates that the measurement is valid. A value other than 0 indicates that an error occurred during the measurement process.

Example Integrity Indicators

Value Returned	Description (message also appears on test set)
0	Normal
1	No Result Available
2	Measurement Timeout
5	Over Range
6	Under Range

Example 13. Programming Example

```
OUTPUT Test_set;"FETC:DTXP?"
ENTER Test_set;Integrity,Avg_dig_pow
IF Integrity=0 THEN
  PRINT "AVG DIG POW= ";Avg_dig_pow
ELSE
  PRINT "DTXP Measurement Error"
  PRINT "DTXP Measurement Integrity is ";Integrity
END IF
```

Alternative Measurement Process

You may choose to test in a sequential way rather than use the concurrent measurement process.

For instance, instead of using the INIT:DONE? query to determine when a measurement is complete, you may choose to initiate a set of measurements and then simply fetch them sequentially.

Example 14. Programming Example

```
OUTPUT Test_set; "INIT:DTXP;MACC"
OUTPUT Test_set; "FETC:DTXP:POW?"
ENTER Test_set;Avg_dig_pow
OUTPUT Test_set; "FETC:MACC:EVM[1]?"
ENTER Test_set;Max_EVM1
```

In this example, the test set starts both measurements at the same time. However, if the MACC measurement finishes first, the results are not fetched until the DTXP measurement finishes. Therefore, this process requires that you understand the order in which measurements will complete in order to optimize your testing speed.

Step 6: Reconfigure Test Set and Mobile Station Connection Parameters

The following information provides additional details on Step 6 of the Programming Flowchart. This information is applicable to all test applications.

Description

After performing a set of measurements on the mobile station using the configuration established in step 2, you may want to change this configuration and test the mobile station again. This step involves changing testing conditions such as channel, mobile station transmit power level, or cell power.

Contents

- [“Change Channels”](#)
- [“Change Other Connection Parameters”](#)

Change Channels

In a manufacturing environment it is common to test a mobile station on more than one channel. Some or all of the tests may be performed on multiple channels, to verify the mobile station’s performance in a range of operating frequencies.

Perform a Handoff (Handover) in Active Cell Mode

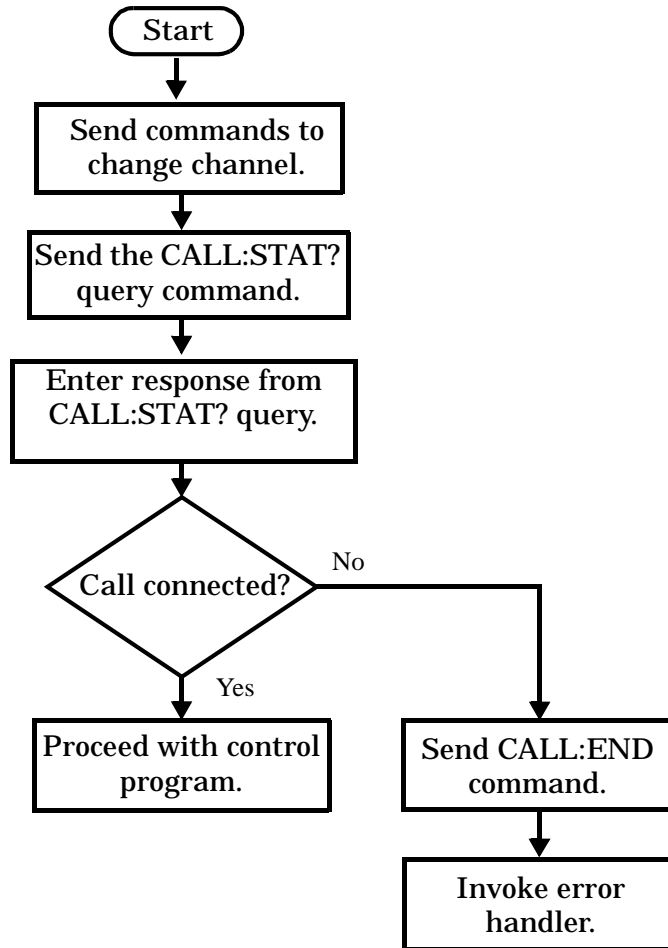
If you are operating in active cell mode, to change channels you perform a handoff (handover) to the new channel. The control program sends the commands to initiate the handoff (handover), and then determines whether the transition was successfully completed. This is accomplished using the CALL:STATus? query.

The CALL:STATus? query immediately returns the state of the call at the time the query is received.

Example Responses Returned from the CALL:STAT? Query

Response	Meaning
IDLE	The call is in the Idle state
ALER	The call is in the Alerting transitory state.
HAND	The call is in the Handoff transitory state.
PAG	The call is in the Paging transitory state.
CONN	The call is in the Connected state.

After issuing the commands to perform a handoff (handover), you should send the CALL:STAT? query to verify that the call is still connected before resuming testing.

Figure 8. Process for Performing a Handoff (Handover)

Test Mode Considerations In test mode, you can either change the test set's frequencies by using the handoff (handover) commands, or directly control the RF generator and RF analyzer.

In either case, you must also send the appropriate test mode commands to the mobile station to move it to the new channel.

Change Other Connection Parameters

You may also choose to change the mobile station transmit power level or cell power, or other connection parameters such as timeslot or timing advance.

Step 7: End Connection

The following information provides additional details on Step 7 of the Programming Flowchart. This information is applicable to all test applications.

Description

In this step you release the call (in active cell mode) or end the mobile station transmission (in test mode).

Contents

- [“Release the Call in Active Cell Mode”](#)
- [“End the Mobile Station Test Mode Transmission”](#)
- [“Partially Preset the Test Set”](#)

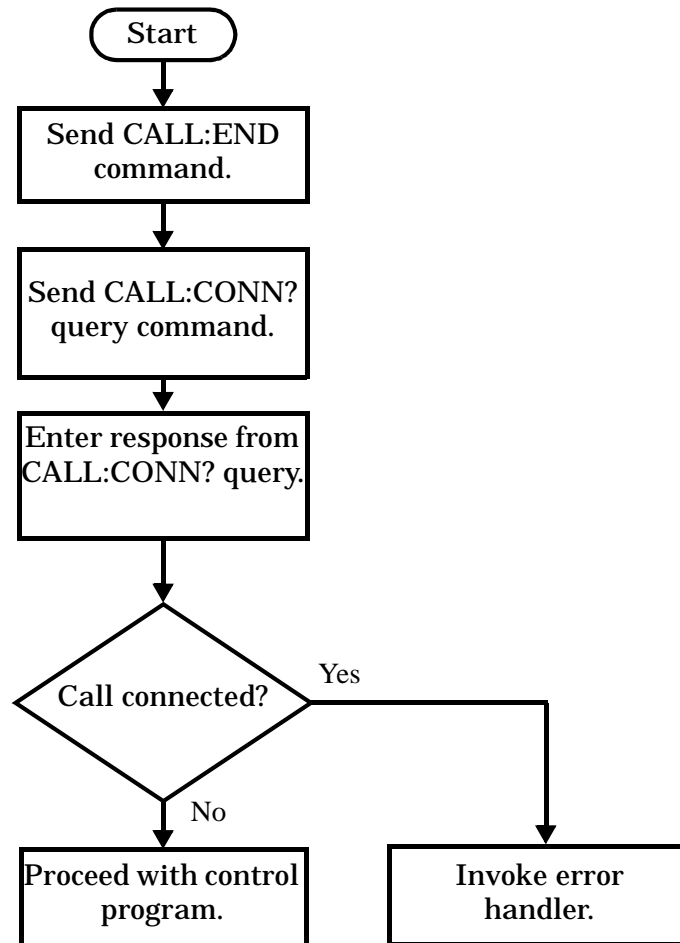
Release the Call in Active Cell Mode

In active cell mode, you can release the call with the mobile station in one of two ways:

- Release from the Base Station
- Release from the Mobile Station

Releasing an Active Call from the Base Station

Figure 9. Process for Releasing an Active Call from the Base Station

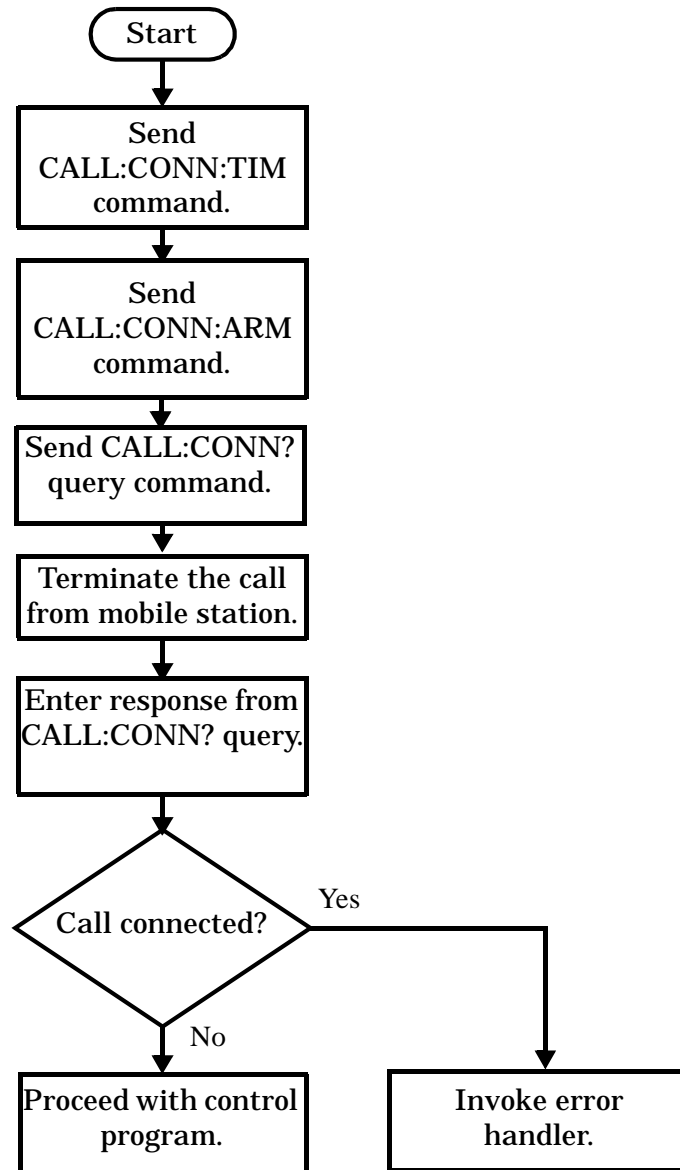


Example 15. Programming Example

```

OUTPUT Test_set;"CALL:END"           ! Initiate a base station release.
OUTPUT Test_set;"CALL:CONN?"        ! Send call connected state query.
ENTER Test_set;Call_connected        ! Program hangs here until state
                                     ! change or timer expires.
IF Call_connected THEN               ! Check if disconnection successful
! <put error handler here>
END IF
! Call is disconnected so proceed with control program
  
```

Releasing an Active Call from the Mobile Station Figure 10. Process for Terminating an Active Call from the Mobile Station



NOTE The test set cannot initiate a call disconnection from the mobile station. You must manually push the end button on the mobile station or send commands to a test bus built into the mobile station. For a mobile station release where the call is terminated by physically pushing a button on the phone (as opposed to using a test bus) ensure that the call-state-change-detector timeout time is long enough to allow the end button to be pushed.

Example 16. Programming Example

```

OUTPUT Test_set;"CALL:CONN:TIM 5" !Set timeout time to 5 seconds.
OUTPUT Test_set;"CALL:CONN:ARM"    !Arm the change detector.
DISP "Terminate the call from the mobile station."
OUTPUT Test_set;"CALL:CONN?" !Initiate call connected state query.
ENTER Test_set;Call_connected      !Program hangs here until state
                                   !change or timer expires.
IF Call_connected THEN              !Check if disconnection successful.
! <put error handler here>
END IF
! Call is disconnected so proceed with control program

```

End the Mobile Station Test Mode Transmission

In test mode, you must send the necessary test mode commands to end the mobile station transmission.

Partially Preset the Test Set

At this point, it is good practice to partially preset the test set by sending the SYST:PRES3 command. This command stops all measurement and call processing processes, but does not reset all values to default.

Step 7: End Connection

General Programming

Programming an Adjacent Channel Leakage Ratio Measurement

Programming Example

```

10  OUTPUT 714;"SETup:WACLeakage:CONTinuous OFF"  !Set the adjacent
20      !channel leakage ratio measurement to single trigger mode.
30  OUTPUT 714;"SETup:WACLeakage:TIMEout 1S"!Set a timeout value of 1 second
40      !in case the measurement cannot be made.
50  OUTPUT 714;"SETup:WACLeakage:COUNT 5"!Set multi-measurements to 5 and
60      !enable multi-measurements.
70  OUTPUT 714;"SETup:WACLeakage:TRIGger:SOURce AUTO" !Set the trigger source
80      !to use automatic triggering.
90  OUTPUT 714;"SETup:WACLeakage:LOWer2:STATE OFF" !Turn off the lower
100     !second alternate (-10 MHz) measurement.
110  OUTPUT 714;"SETup:WACLeakage:UPPER2:STATE OFF" !Turn off the upper
120     !second alternate (+10 MHz) measurement.
130  OUTPUT 714;"INITiate:WACLeakage"!Start the adjacent channel leakage
140     !ratio measurement.
150  OUTPUT 714;"FETCh:WACLeakage?"!Query the returned integrity indicator, and the
160     !measurement values for each offset.
170  ENTER 714;Integrity,Low_1st_alt,Hi_1st_alt,Low_2nd_alt,Hi_2nd_alt !Enter the
180     !returned values into variables.
190  IF Integrity<>0 THEN !Integrity <> 0 indicates an valid measurement.
200     PRINT "Measurement problem; check for signal level over/under range condition."
210  ELSE
220  END IF
230  END

```

Returned Values

- Integrity stores the returned integrity indicator value (see [“Integrity Indicator”](#)); 0 means a successful measurement with no errors.
- Because multi-measurements are being used, Low_1st_alt and Hi_1st_alt (± 5 MHz) measurements return the *average* adjacent channel leakage ratio measurement values for those offsets, in dB. If multi-measurements were not being used, the returned values would be a single measurement value for each frequency offset.
- Because the Low_2nd_alt and Hi_2nd_alt (± 10 MHz) measurements are turned off in this example, the returned values are always 9.91E+37 (NAN).

Related Topics

- [“Adjacent Channel Leakage Ratio Troubleshooting”](#)
- [“Adjacent Channel Leakage Ratio Measurement Description”](#)
- [“SETup:WACLeakage”](#)
- [“INITiate”](#)
- [“FETCh:WACLeakage”](#)
- [“Amplitude Offset”](#)
- [“Integrity Indicator”](#)

Programming an Audio Level Measurement

This section provides an example of how to make an audio level measurement with the Audio Analyzer (AFANalyzer) via GPIB.

The following procedure assumes that an audio source is connected to the AUDIO IN connectors. See [“Audio Analyzer Measurement Description”](#).

1. Configure audio analyzer measurement parameters using the SETup subsystem. Even though default settings exist for each parameter, it is a good idea to deliberately set each parameter to make sure the setting is correct for the specific audio analyzer measurement you are making.
2. Start the audio analyzer measurement using the INITiate subsystem.
3. Use the FETCh? subsystem to obtain audio analyzer measurement results.

Programming Example

```

10 OUTPUT 714;"SETup:AFANalyzer:CONTinuous OFF" !Set the audio analyzer
20                                     !measurements to single trigger mode.
30 OUTPUT 714;"SETup:AFANalyzer:PEAK:VOLTage 3V" !Set the Expected Amplitude level for
40                                     !audio input voltage in Vpeak.
50 OUTPUT 714;"SETup:AFANalyzer:SDISortion:STATe OFF" !Turn off the SINAD and
60                                     !distortion measurements since
70                                     !they are not being used.
80 OUTPUT 714;"SETup:AFANalyzer:FILTer NONE" !Bypass all audio filters.
90 OUTPUT 714;"SETup:AFANalyzer:DEMphasis:STATe OFF" !Turn off de-emphasis.
100 OUTPUT 714;"SETup:AFANalyzer:EXPandor:STATe OFF" !Turn off the expander.
110 OUTPUT 714;"SETup:AFANalyzer:DETEctor RMS" !Specify the RMS detector for the
120                                     !audio measurement.
130 OUTPUT 714;"SETup:AFANalyzer:TIMEout 3S" !Set a timeout value of 3 seconds
140                                     !in case the measurement cannot be made.
150 OUTPUT 714;"INITiate:AFANalyzer" !Start the AF Analyzer measurement.
160 OUTPUT 714;"FETCh:AFANalyzer:VOLTage?" !Fetch the Audio Level result.
170 ENTER 714;Audio_level !Enter the returned value into a variable.
180 END

```

Returned Values

The results returned by this program are:

- `Integrity` returns the measurement integrity indicator (0 means a successful measurement with no errors). See [“Integrity Indicator” on page 153](#).
- `Audio_level` returns the analog audio level in volts rms.

Related Topics

[“Audio Analyzer Measurement Description” on page 33](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“INITiate” on page 263](#)

[“SETup:AFANalyzer” on page 285](#)

[“FETCh:AFANalyzer” on page 224](#)

Programming an Audio Frequency Measurement

This section provides an example of how to make an audio frequency measurement with the Audio Analyzer (AFANalyzer) via GPIB.

The following procedure assumes that an audio source is connected to the AUDIO IN connectors. See [“Audio Analyzer Measurement Description”](#).

1. Configure audio analyzer measurement parameters using the SETup subsystem. When more than one audio frequency signal may be present, use the 100 Hz bandpass filter to isolate the desired signal for measurement (see the Programming Example below).
2. Start the audio analyzer measurement using the INITiate subsystem.
3. Use the FETCh? subsystem to obtain audio analyzer measurement results.

Programming Example

```

10 OUTPUT 714;"SETup:AFANalyzer:CONTinuous OFF" !Set the audio analyzer
20                                     !measurements to single trigger mode.
30 ! OUTPUT 714;"SETup:AFANalyzer:PEAK:VOLTage 3V" !Set the Expected peak voltage
40                                     !for the audio input level in Vpeak.
50 OUTPUT 714;"SETup:AFANalyzer:FREQuency:STATe ON" !Enable audio frequency measurement.
60 OUTPUT 714;"SETup:AFANalyzer:FILTer TBPass" !Select the 100 Hz bandpass filter.
70 OUTPUT 714;"SETup:AFANalyzer:FILTer:TBPass 6000 Hz" !Set the 100 Hz bandpass
80     !filter's center frequency to 6 kHz (example; to measure SAT frequency).
90 OUTPUT 714;"SETup:AFANalyzer:TIMEout 3S" !Set a timeout value of 3 seconds
100                                     !in case the measurement cannot be made.
110 OUTPUT 714;"INITiate:AFANalyzer" !Start the AF Analyzer measurement.
120 OUTPUT 714;"FETCh:AFANalyzer:FREQuency?" !Fetch the Audio Frequency result.
130 ENTER 714;Audio_frequency !Enter the returned value into a variable.
140 END

```

Related Topics

[“Audio Frequency Measurement Description” on page 36](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“Audio Analyzer Measurement Description” on page 33](#)

[“INITiate” on page 263](#)

[“SETup:AFANalyzer” on page 285](#)

[“FETCh:AFANalyzer” on page 224](#)

Programming a Channel Power Measurement

Programming Example

```

10  OUTPUT 714;"SETup:WCPower:CONTinuous OFF"!Set the channel power
20                                     !measurement to single trigger mode.
30  OUTPUT 714;"SETup:WCPower:TIMEout 1S"!Set a timeout value of 1 second
40                                     !in case the measurement cannot be made.
50  OUTPUT 714;"SETup:WCPower:COUNT 5"!Set multi-measurements to 5 and
60                                     !enable multi-measurements.
70  OUTPUT 714;"SETup:WCPower:INTerval:TIME 666.7US"!Set the measurement interval
80                                     !for 1 timeslot (666.7 us).
90  OUTPUT 714;"SETup:WCPower:TRIGger:SOURce AUTO" !Set the trigger source
100                                     !to use automatic triggering.
110 OUTPUT 714;"INITiate:WCPower"!Start the channel power measurement.
120 OUTPUT 714;"FETCh:WCPower?"!Query the returned integrity indicator and the
130                                     !average channel power measurement.
140 ENTER 714;Integrity,Wcpower!Enter the returned values into variables.
150 IF Integrity<>0 THEN !Integrity <> 0 indicates an invalid measurement.
170     PRINT "Measurement problem; check for signal level over/under range condition."
171 ELSE
180     END IF
190     END

```

Returned Values

- `Integrity` stores the returned integrity indicator value (see [“Integrity Indicator”](#)); 0 means a successful measurement with no errors.
- `Wcpower` returns the *average* channel power measurement value in dBm.

Related Topics

- [“Channel Power Troubleshooting”](#)
- [“Channel Power Measurement Description”](#)
- [“SETup:WTPower”](#)
- [“INITiate”](#)
- [“FETCh:WTPower”](#)
- [“Amplitude Offset”](#)
- [“Integrity Indicator”](#)

Programming a Distortion Measurement

This section provides an example of how to make distortion measurements via GPIB. Distortion measurements are not typically made when testing W-CDMA mobiles, but are more common when testing AMPS or other analog mobiles. The programming example below is typical for an AMPS mobile.

SINAD and Distortion measurements are affected by the same STATE and INITiate commands, so both measurements are enabled and triggered at the same time. However, measurement results are queried separately. See [“Audio Analyzer Measurement Description” on page 33](#).

The following procedure assumes that the mobile's audio output is connected to the AUDIO IN connectors and the mobile is on an analog voice channel (AVC). The AVC is being modulated with a 1004 Hz tone at ± 8 kHz peak deviation, and a 6000 Hz SAT at ± 2 kHz peak deviation. It is also assumed that the Cell Power from the test set is set to -50 dBm (IS-137 standard).

1. Configure audio analyzer measurement parameters using the SETup subsystem.
2. Start the audio analyzer measurement using the INITiate subsystem.
3. Use the FETCh? subsystem to obtain audio analyzer measurement results.

Programming Example

```

10  OUTPUT 714;"SETup:AFANalyzer:CONTinuous OFF" !Set the audio analyzer
19                                      !measurements to single trigger mode.
30  OUTPUT 714;"SETup:AFANalyzer:PEAK:VOLTage 3V" !Set the Expected Amplitude level for
39                                      !audio input voltage in Vpeak.
50  OUTPUT 714;"SETup:AFANalyzer:SDISTortion:STATE ON" !Turn on the SINAD and
59                                      !distortion measurements.
70  OUTPUT 714;"SETup:AFANalyzer:SDISTortion:FREQuency 1004 HZ" !Specify the audio
79                                      !frequency to use for the measurements.
90  OUTPUT 714;"SETup:AFANalyzer:FILTer CMessage" !Select the c-message filter.
100 OUTPUT 714;"SETup:AFANalyzer:DEMPHasis:STATE OFF" !Turn off de-emphasis.
110 OUTPUT 714;"SETup:AFANalyzer:EXPandor:STATE OFF" !Turn off the expandor.
120 OUTPUT 714;"SETup:AFANalyzer:TIMEout 3S" !Set a timeout value of 3 seconds
129                                     !in case the measurement cannot be made.
140 OUTPUT 714;"INITiate:AFANalyzer" !Start the AF Analyzer measurement.
150 OUTPUT 714;"FETCh:AFANalyzer:INTEgrity?" !Query the integrity indicator to
159                                     !verify that a reliable measurement was made.
170 ENTER 714;Integrity !Enter the returned value into a variable for comparison
179                                     !with possible integrity indicator values (not shown here).
190 IF Integrity=0 THEN !Only fetch measurement result if integrity indicator is 0.
200 OUTPUT 714;"FETCh:AFANalyzer:DISTortion?" ! Fetch the Distortion result.
210 ENTER 714;Distortion !Enter the returned value into a variable.
220 END IF
230 END

```

Returned Values

The results returned by this program are:

- `Integrity` returns the measurement integrity indicator; 0 means a successful measurement with no errors. See [“Integrity Indicator” on page 153](#).
- `Distortion` returns the Distortion measurement value in percent (%).

Related Topics

[“Audio Analyzer Measurement Description” on page 33](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“Distortion Measurement Description” on page 39](#)

[“INITiate” on page 263](#)

[“SETup:AFANalyzer” on page 285](#)

[“FETCh:AFANalyzer” on page 224](#)

Programming a Loopback Bit Error Ratio Measurement

Programming Example

```

10  OUTPUT 714;"SETup:WBError:CONTinuous Off"!Set the loopback BER
20  !measurement to single trigger mode.
30  OUTPUT 714;"SETup:WBError:TIMEout 10S"!Set a timeout value of 10 seconds
40  !and enable timeouts in case the measurement cannot be made.
50  OUTPUT 714;"SETup:WBError:COUNT 12200"!Set the bits to test to 12200.
60  OUTPUT 714;"INITiate:WBError"!Start the measurement.
70  OUTPUT 714;"FETCh:WBError?"!Query the returned integrity indicator and the
80  !average thermal power measurement.
90  ENTER 714;Integrity,Ber_percent,Bit_errors,Bits_tested !Enter the returned
100 !values into variables.
110 IF Integrity<>0 THEN !Integrity <> 0 indicates an invalid measurement.
120   PRINT "Measurement problem; check for signal level over/under range condition."
130 ELSE
140   END IF
150   END

```

Returned Values

- Integrity stores the returned integrity indicator value (see [“Integrity Indicator”](#)); 0 means a successful measurement with no errors.
- Ber_percent, Bit_errors, and Bits_tested store the returned values for the bit error ratio (in %), the number of bit errors measured, and the number of bits tested, respectively.

Related Topics

[“Loopback Bit Error Ratio Measurement Description”](#)

[“Loopback Bit Error Ratio Troubleshooting”](#)

[“SETup:WBError”](#)

[“INITiate”](#)

[“FETCh:WBError”](#)

[“Integrity Indicator”](#)

Programming a SINAD Measurement

This section provides an example of how to make SINAD measurement via GPIB. SINAD measurements are not typically made when testing W-CDMA mobiles but, are more common when testing AMPS or other analog mobiles. The programming example below is typical for an AMPS mobile.

SINAD and Distortion measurements are affected by the same STATE and INITiate commands, so both measurements are enabled and triggered at the same time. However, measurement results are queried separately. See [“Audio Analyzer Measurement Description” on page 33](#).

The following procedure assumes that the mobile's audio output is connected to the AUDIO IN connectors and the mobile is on an analog voice channel (AVC) that is being modulated with a 1004 Hz tone at +/-8 kHz peak deviation. It is also assumed that the Cell Power from the test set is set to a minimum usable level (typically about -116 dBm).

1. Configure audio analyzer measurement parameters using the SETup subsystem.
2. Start the audio analyzer measurement using the INITiate subsystem.
3. Use the FETCh? subsystem to obtain audio analyzer measurement results.

Programming Example

```

10 OUTPUT 714;"SETup:AFANalyzer:CONTinuous OFF" !Set the audio analyzer
20                                     !measurements to single trigger mode.
30 OUTPUT 714;"SETup:AFANalyzer:PEAK:VOLTage 3V" !Set the Expected Amplitude level for
40                                     !audio input voltage in Vpeak.
50 OUTPUT 714;"SETup:AFANalyzer:SDIStortion:STATE ON" !Turn on the SINAD and
60                                     !distortion measurements.
70 OUTPUT 714;"SETup:AFANalyzer:SDIStortion:FREQuency 1004 HZ" !Specify the audio
80                                     !frequency to use for the measurements.
90 OUTPUT 714;"SETup:AFANalyzer:FILTer CMESsage" !Select the c-message filter.
100 OUTPUT 714;"SETup:AFANalyzer:DEMPHasis:STATE OFF" !Turn off de-emphasis.
110 OUTPUT 714;"SETup:AFANalyzer:EXPandor:STATE OFF" !Turn off the expander.
120 OUTPUT 714;"SETup:AFANalyzer:TIMEout 3S" !Set a timeout value of 3 seconds
130                                     !in case the measurement cannot be made.
140 OUTPUT 714;"INITiate:AFANalyzer" !Start the AF Analyzer measurement.
150 OUTPUT 714;"FETCh:AFANalyzer:INTEgrity?" !Query the integrity indicator to
160                                     !verify that a reliable measurement was made.
170 ENTER 714;Integrity !Enter the returned value into a variable for comparison
180                                     !with possible integrity indicator values (not shown here).
190 IF Integrity=0 THEN !Only fetch measurement result if integrity indicator is 0.
200 OUTPUT 714;"FETCh:AFANalyzer:SINAD?" !Fetch the SINAD result.
210 ENTER 714;Sinad !Enter the returned value into a variable.
220 END IF
230 END

```

Returned Values

The results returned by this program are:

- `Integrity` returns the integrity indicator (0 means a successful measurement with no errors). See [“Integrity Indicator” on page 153](#).
- `SINAD` returns the SINAD value in dB.

Related Topics

[“Audio Analyzer Measurement Description” on page 33](#)

[“AFANalyzer Troubleshooting” on page 451](#)

[“INITiate” on page 263](#)

[“SETup:AFANalyzer” on page 285](#)

[“FETCh:AFANalyzer” on page 224](#)

Programming a Thermal Power Measurement

Programming Example

```

10  OUTPUT 714;"SETup:WTPower:CONTinuous Off"!Set the thermal power
20  !measurement to single trigger mode.
30  OUTPUT 714;"SETup:WTPower:TIMEout 2S"!Set a timeout value of 2 seconds
40  !and enable timeouts in case the measurement cannot be made.
50  OUTPUT 714;"SETup:WTPower:COUNT 5"!Set multi-measurements to 5 and
60  !enable multi-measurements.
70  OUTPUT 714;"INITiate:WTPower"!Start the measurement.
80  OUTPUT 714;"FETCh:WTPower?"!Query the returned integrity indicator and the
90  !average thermal power measurement.
100 ENTER 714;Integrity,Wtpower!Enter the returned values into variables.
110 IF Integrity<>0 THEN !Integrity <> 0 indicates an invalid measurement.
120   PRINT "Measurement problem; check for signal level over/under range condition."
130 ELSE
140 END IF
150 END

```

Returned Values

- Integrity stores the returned integrity indicator value (see [“Integrity Indicator”](#)); 0 means a successful measurement with no errors.
- Because multi-measurements are being used in this example, Wtpower stores the returned *average* thermal power measurement value in dBm. If multi-measurements were not being used, the returned value would be a single thermal power measurement value.

Related Topics

- [“Thermal Power Troubleshooting”](#)
- [“Thermal Power Measurement Description”](#)
- [“SETup:WTPower”](#)
- [“INITiate”](#)
- [“FETCh:WTPower”](#)
- [“Amplitude Offset”](#)
- [“Integrity Indicator”](#)

Programming a Waveform Quality Measurement

Programming Example

```

10  OUTPUT 714;"SETup:WWQuality:CONTinuous Off"    !Set the waveform quality
20                                     !measurement to single trigger mode.
30  OUTPUT 714;"SETup:WWQuality:TIMEout 1S"!Set a timeout value of 1 second
40                                     !in case the measurement cannot be made.
50  OUTPUT 714;"SETup:WWQuality:COUNT 5"    !Set multi-measurements to 5 and
60                                     !enable multi-measurements.
70  OUTPUT 714;"SETup:WWQuality:TSLot 11" !Set the measurement to
80                                     !measure waveform quality during timeslot 11.
90  OUTPUT 714;"INITiate:WWQuality" !Start the waveform quality measurement.
100 OUTPUT 714;"FETCh:WWQuality?"    !Query the integrity indicator and all
110                                     !results for the waveform quality measurement.
120 ENTER 714;Integrity,Evm,Freq_err,Orig_off,Phs_err,Mag_err !Enter the
130                                     !returned integrity indicator and measurement values into variables.
140 IF Integrity=0 THEN !See if the integrity value = 0 (valid measurement).
150 ELSE
160 PRINT "INTEGRITY";Integrity
170     PRINT "Measurement problem; check for signal level over/under range condition."
180 END IF
190 END

```

Returned Values

- Integrity stores the returned integrity indicator value (see ["Integrity Indicator"](#)); 0 means a successful measurement with no errors.
- Evm returns the maximum error vector magnitude result.
- Freq_err returns the worst case frequency error result.
- Orig_off returns the maximum origin offset result.
- Phs_err returns the maximum phase error result.
- Mag_err returns the maximum magnitude error result.

Related Topics

- [“Waveform Quality Troubleshooting”](#)
- [“Waveform Quality Measurement Description”](#)
- [“SETup:WWQuality”](#)
- [“INITiate”](#)
- [“FETCh:WWQuality”](#)
- [“Amplitude Offset”](#)
- [“Integrity Indicator”](#)

Preset Descriptions

Description

The test set is capable of accepting several different preset commands.

At no time during a preset operation, does transmit power exceed the last user setting of the transmit power. The input power is not set to any value lower than the last user setting of the input power. This is to avoid power spikes on the output and possible receiver damage on the input during transitions associated with preset operations.

Partial Preset

Partial preset saves setup time because measurement setup parameters remain unchanged. This is the recommended way to place the test set in a known condition.

When you fast switch between formats in a fast switching test application the test set behaves as if a partial preset has occurred. The table below lists some key partial preset results.

Example

```
OUTPUT 714;"SYSTEM:PRESET3" !Command for a partial preset when user in
!remote operation.
```

SYSTEM:PRESET3 is the recommended command for a partial preset operation. The SYSTEM:PRESET[1] command is not recommended for use at this time.

Press the green Preset key on the front panel to perform a partial preset.

Table 2. Partial Preset Behavior

Function	Partial Preset Result
Trigger Arm	no change
Measurement parameters	no change
Calibration data	no change
Enable registers	no change
Positive Transition Filter registers	no change
Negative Transition Filter registers	no change
Contents of RAM	no change
Contents of output queue	no change
Contents of error queue	no change

Table 2. Partial Preset Behavior

Function	Partial Preset Result
Maskable Message Display State	no change
Operating Mode	Active Cell
Measurements	aborted and inactivated
Measurement results	NAN
Measurement integrity indicator	1 = no result available
Transmit Power State	ON
Cell Activated State	ON
Call in progress	aborted
Call Control Status	Idle
Call Counters	cleared
Call Error Counters	cleared
SACCH	cleared
Pending Service request	not cleared

Full Preset

A full preset requires you to select new measurements and configure their parameters. If measurement parameters do not need to be changed, use a partial preset to save time.

Example

OUTPUT 714;"*RST" !Recommended command for a full preset, sets trigger arm to single.

OUTPUT 714;"SYSTEM:PRESET2" !Command for a full preset, sets trigger arm to continuous.

The *RST common command is the recommended command for a full preset operation.

NOTE Transmit power is not set to OFF during a full preset, transmit power is set to the default value.

Table 3. Full Preset Behavior

Function	Full Preset Result
Trigger Arm	Continuous (manual operation full preset or SYSTEM:PRESET2 command)
Trigger Arm	Single (remote operation full preset, *RST command)
Measurement Parameters	all set to defaults
Maskable Message Display State	On (manual operation full preset)
Maskable Message Display State	Off (remote operation full preset)

Status Preset

The STATUS:PRESET command sets the status system as defined in “SCPI 1995 Volume 2: Command Reference” section 20.7. All of the enable registers are set to 0, all PTR registers are set to 1, and all NTR registers are set to 0.

Example

OUTPUT 714;“STATUS:PRESET” !Presets the STATus subsystem.

Related Topics

[“SYSTem:PRESet”](#)

Receiver Control

The test set normally sets all receiver parameters automatically. You can also control the test set's receiver parameters manually rather than allowing the test set to control them. This ability is referred to as manual receiver control.

Manual Versus Automatic Receiver Control

- **Auto** mode receiver control is the default for all operating modes except CW (see “[CW Operating Mode](#)”). Using automatic receiver control, the receiver's expected power and frequency settings are set automatically according to the settings you enter on the Call Setup Screen.
- **Manual** mode can be used to override some or all of the automatic receiver settings. You can manually set the receiver's expected power, the measurement downconverter's tune frequency (Measurement Frequency), and the demodulation downconverter's tune frequency (Uplink Frequency) by highlighting the setting, pressing the knob, and entering or selecting the new value. A full or partial preset of the test set, including cycling power, returns the test set back to auto mode.

Figure 11. Selecting Auto or Manual Receiver Control

The screenshot shows the 'Call Setup Screen' with the following sections:

- Call Control** (Left sidebar)
- FDD Test Operating Mode** (Main area)
 - Generated Power Level Information**

	Current Level	Desired Level
Cell Power (dBm/3.84 MHz):	-115.00	-115.00
AUGH Power (dBm/3.84 MHz):	Off	Off
Total RF Power (dBm/3.84 MHz):	-115.00	-115.00
 - Downlink Code Channel Information**
 - Primary Scrambling Code: 1
 - Receiver Control**

Receiver Control	Value
Power Control	Manual
Manual Power	0.00 dBm
Measurement Frequency	Auto
Uplink Frequency	Auto
- Call Params** (Right sidebar)
 - MS Target Power: 24 (F7)
 - UL CL Power Ctrl: Alternating bits (F8)
 - Send Step Up TPC Bit Pattern (F9)
 - Send Step Down TPC Bit Pattern (F10)
 - RF Gen Freq Ctrl: Auto (F11)
 - Receiver Control: Auto (F12)
 - 3 of 3 (More)

Front Panel Access to Receiver Controls

To access receiver control settings on the test set's front panel while using FDD Test operating mode, press the **CALL SETUP** key, press the **More** key until 3 of 3 is displayed, and select Receiver Control (F12). See [Figure 11. "Selecting Auto or Manual Receiver Control"](#).

In CW operating mode, receiver control is accessed by pressing F12.

Expected Power

To make accurate measurements, the test set needs to know how much power to expect at its RF IN/OUT port; this is referred to as the Expected Power. If a measurement uses autoranging (such as the thermal power and ACLR measurements), the expected power level is calibrated by the test set before making the measurement and does not need to be set by the user. For measurements that do not use autoranging, it gets the expected power value from the MS Target Power setting during automatic receiver control, or by the user specifying the Manual Power value with the receiver Power Control set to Manual. Refer to [Figure 11. "Selecting Auto or Manual Receiver Control"](#).

The test set uses the expected power level to establish a range of acceptable input levels into its receivers. If the received signal is above or below the acceptable range, an Over Range or an Under Range message is displayed and the integrity value for the measurement is set to 5 or 6 (respectively).

You can enter an expected power level setting that is beyond the actual capability of the test set's hardware. This is because expected power is intended to reflect the potential range of RF power *at the mobile station (UE)*. This range of RF power is meant to accommodate the use of a gain or loss network between the mobile station and the test set. See ["Amplitude Offset" on page 47](#) for details about entering amplitude offsets.

The upper and lower limits of expected power provide boundaries for the combination of amplitude offset and expected power. If you set expected power to +52 dBm and the amplitude offset to -3 dB, the calculated receiver power will be +49 dBm, but the test set shall be set to +43 dBm, the upper limit of the hardware.

GPIO Equivalent Commands for Receiver Control

The following settings control the test set's receivers:

Power Control (Except for CW Mode)

The expected power from the mobile station (UE) is set manually by enabling manual power control using the `"RFANalyzer:CONTrol:POWer:AUTO"` command, and by using the `"RFANalyzer:MANual:POWer[SElected]"` command to set the level.

CW receiver power

When using the CW operating mode, the expected power from the mobile station is set manually using the `"RFANalyzer:CW:EXPEcted:POWer"` command.

Measurement receiver frequency

Measurement receiver frequency commands are used to manually tune the test set's measurement downconverter input signal path (see ["Block Diagram"](#)). This path is used by the channel power, waveform quality, and adjacent channel leakage ratio measurements.

The commands are:

- ["RFANalyzer:MANual:MEASurement\[:MFRequency\]"](#) (to specify a frequency and turn manual mode on)
- ["RFANalyzer:CONTRol:MEASurement:FREQuency:AUTO"](#) (to turn manual mode on/off)
- ["RFANalyzer:MANual:MEASurement:FREQuency"](#) (to specify a frequency)

Demodulation (uplink) receiver frequency

Demodulation receiver frequency commands are used to manually tune the test set's demodulation downconverter input signal path (see ["Block Diagram"](#)). The demodulation downconverter signal path is part of the function that demodulates information from the mobile station's (UE) uplink channel transmission. This path is used by the loopback bit error ratio measurement.

The commands are:

- ["RFANalyzer:MANual:UPLink\[:MFRequency\]"](#) (to specify a frequency and turn manual mode on)
- ["RFANalyzer:CONTRol:UPLink:FREQuency:AUTO"](#) (to turn manual mode on/off)
- ["RFANalyzer:MANual:UPLink:FREQuency"](#) (to specify a frequency)

Effects on Receiver Control When Changing Operating Mode

After selecting the operating mode and setting one or more receiver controls to manual, the receiver control settings remain as you set them until you change operating mode. Changing operating mode causes some or all receiver parameters to return to automatic control.

Related Topics

["RFANalyzer"](#)

["CW Operating Mode"](#)

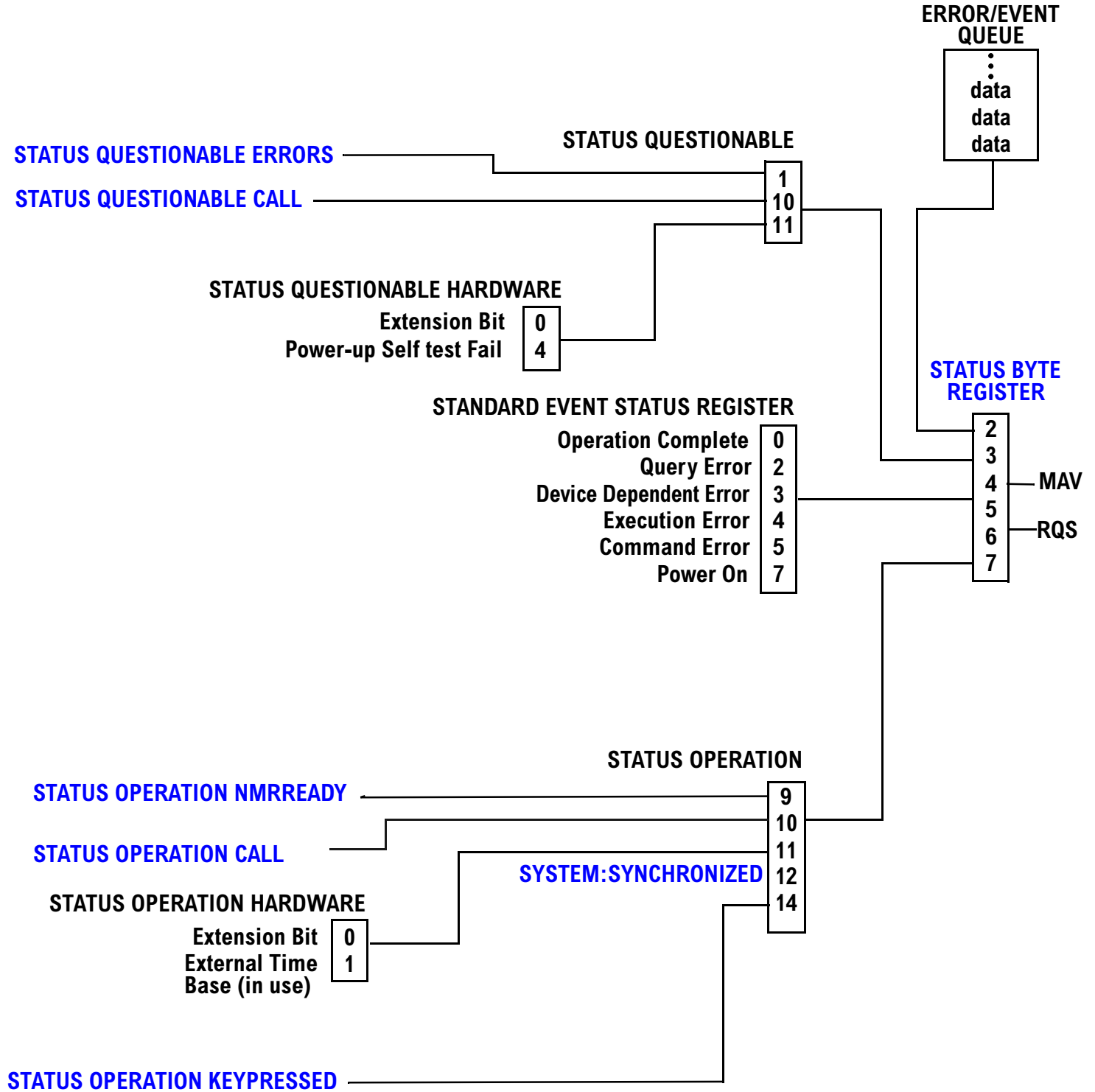
["FDD Test Operating Mode"](#)

Status Subsystem Overview

The following pages present an overview of the entire status subsystem, including test applications which may or may not be loaded in your test set.

Description

Overview of STATUS Reporting Structure



Status Reporting Structure For STATUS QUESTIONABLE and STATUS OPERATION

STATUS QUESTIONABLE CALL

Extension Bit	0
COMMon Summary	1
GSM Summary	2
AMPS Summary	3
DIGital 136 Summary	4
TA136 Summary	5
DIGital 95 Summary	6
DIGital 2000 Summary	7
CDMA Summary	8
TA 2000 Summary	9
GPRS Summary	12

Bit 10
STATUS
QUESTIONABLE

STATUS QUESTIONABLE ERRORS

Extension Bit	0
COMMon Summary	1
GSM Summary	2
AMPS Summary	3
DIGital 136 Summary	4
TA136 Summary	5
DIGital 95 Summary	6
DIGital 2000 Summary	7
CDMA Summary	8
TA 2000 Summary	9
FDD Summary	10
WCDMA Summary	11
GPRS Summary	12

Bit 1
STATUS
QUESTIONABLE

Some status registers are not functional at this time.

STATUS OPERATION CALL

Extension Bit	0
COMMon Summary	1
GSM Summary	2
AMPS Summary	3
DIGital 136 Summary	4
TA136 Summary	5
DIGital 95 Summary	6
DIGital 2000 Summary	7
CDMA Summary	8
TA 2000 Summary	9

Bit 10
STATUS
OPERATION

STATUS OPERATION NMRREADY

Extension Bit	0
COMMon Summary	1
GSM Summary	2
AMPS Summary	3
DIGital 136 Summary	4
TA136 Summary	5
DIGital 95 Summary	6
DIGital 2000 Summary	7
CDMA Summary	8
TA 2000 Summary	9
FDD Summary	10
WCDMA Summary	11
GPRS Summary	12

Bit 9
STATUS
OPERATION

Status Reporting Structure For STATus OPERation KEYPressed Register**STATUS OPERATION KEYPRESSED**

F1 softkey	0	Bit 14 STATUS OPERATION
F2 softkey	1	
F3 softkey	2	
F4 softkey	3	
F5 softkey	4	
F6 softkey	5	
F7 softkey	6	
F8 softkey	7	
F9 softkey	8	
F10 softkey	9	
F11 softkey	10	
F12 softkey	11	

Status Reporting Structures for the COMMON Registers

STATUS QUESTIONABLE ERRORS COMMON

Extension Bit	0
+100 Messages	1
+200 Messages	2
+300 Messages	3
+400 Messages	4
+500 Messages	5
+600 Messages	6
+700 Messages	7
+800 Messages	8
+900 Messages	9
RUI Maskable Messages	14

Bit 1
STATUS
QUESTIONABLE
ERRORS

STATUS OPERATION CALL COMMON

Extension Bit	0
Call Control Status Idle	1
Call Control Status Connected	2
Call Control Status Alerting	3
Call Control Status Registering	4
Call Control Status Handover	5
Call Control Status Changing	6
BS Originating	7
Reserved	8
Registering (BS Initiated)	9
Call Control Status Paging	10
Call Control Status Releasing	11
Call Control Status Set Up Request	12
Call Control Status Access Probe	13
Data Summary	14

Bit 1
STATUS
OPERATION
CALL

STATUS OPERATION CALL COMMON DATA

Extension Bit	0
Data Connection Status Idle	1
Data Connection Status Attached	2
Data Connection Status Transferring	3
Data Connection Status Data Connected	4
Data Connected Status Off	5
Data Connected Control Status Changing	6
Starting Data Connection	7
PDP Active State	8

Bit 14
STATUS
OPERATION
CALL COMMON

STATUS OPERATION NMRREADY COMMON

Extension Bit	0
Audio Analyzer	1
Swept Audio	2

Bit 1
STATUS
OPERATION
NMRREADY

Status Reporting Structure for the GSM Registers

STATUS QUESTIONABLE CALL GSM

Extension Bit	0
Date Link Failure	1
Radio Link Failure	2
Immediate Assignment Failure	3
Channel Assignment Failure	4
Handover Failure	5
No Response to Page	6
Channel Assignment > Frames	7
Identification Failure	8
Channel Mode Not Supported	9

Bit 2
STATUS
QUESTIONABLE

STATUS QUESTIONABLE ERRORS GSM

Extension Bit	0
+100 Messages	1
+200 Messages	2
+300 Messages	3
+400 Messages	4
+500 Messages	5
+600 Messages	6
+700 Messages	7
+800 Messages	8
+900 Messages	9

Bit 2
STATUS
QUESTIONABLE
ERRORS

STATUS OPERATION NMRREADY GSM

Extension Bit	0
Tx Power	1
Power vs. Time	2
Phase/Freq Error	3
Output RF Spectrum	4
Analog Audio	5
Decoded Audio	6
Fast Bit Error Rate	7
Bit Error	8
I/Q Tuning	9
Dynamic Power	10

Bit 2
STATUS
OPERATION
NMRREADY

STATUS OPERATION CALL GSM

Extension Bit	0
Idle	1
Connected	2
Alerting	3
BCH Changing	4
TCH Changing	5
Control Status Changing	6
BS Originating	7
BS Disconnecting	8

Bit 2
STATUS
OPERATION
CALL

Status Reporting Structure For the GPRS Registers

STATUS QUESTIONABLE CALL GPRS

Extension Bit	0
Attach Failure	1
Detach Failure	2
Routing Area Update Failure	3
Start Data Connection Failure	4
No Data Received Recently	5
Downlink Timed Out	6
Uplink Immediate Assignment Failure	7
Downlink Immediate Assignment Failure	8
MS Unexpectedly Ended TBF	9
End Data Connection Failure	10

Bit 12
STATUS
QUESTIONABLE
CALL

STATUS QUESTIONABLE ERRORS GPRS

Extension Bit	0
+100 Messages	1
+200 Messages	2
+300 Messages	3
+400 Messages	4
+500 Messages	5
+600 Messages	6
+700 Messages	7
+800 Messages	8
+900 Messages	9

Bit 12
STATUS
QUESTIONABLE
ERRORS

STATUS OPERATION NMRREADY GPRS

Extension Bit	0
Tx Power	1
Power vs. Time	2
Phase/Freq Error	3
Output RF Spectrum	4
Reserved for future use	5
Reserved for future use	6
Reserved for future use	7
Reserved for future use	8
Reserved for future use	9
Reserved for future use	10
GBER	11

Bit 12
STATUS
OPERATION
NMRREADY

Status Reporting Structure for the AMPS Registers

STATUS QUESTIONABLE ERRORS AMPS

Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	Bit 3 STATUS QUESTIONABLE ERRORS
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	
Reserved for future use	10	
Reserved for future use	11	
Reserved for future use	12	
Reserved for future use	13	
MUI Maskable Message	14	

STATUS OPERATION NMRREADY AMPS

Extension Bit	0	
Analog Transmit Power	1	
Frequency Stability	2	Bit 3 STATUS OPERATION NMRREADY
Frequency Modulation	3	

Status Reporting Structure for the DIGital136 Registers

STATUS QUESTIONABLE ERRORS DIGITAL 136

Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	Bit 4 STATUS QUESTIONABLE ERRORS
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	

STATUS OPERATION NMRREADY DIGITAL 136

Extension Bit	0	
Digital Transmit Power	1	
Modulation Accuracy	2	
Adjacent Channel Power	3	Bit 4 STATUS OPERATION NMRREADY
Loopback BER	4	
Digital IQ Adjust	5	
Digital Dynamic Power	6	

Status Reporting Structures for the TA136 Registers

STATUS QUESTIONABLE ERRORS TA136

Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	Bit 5 STATUS QUESTIONABLE ERRORS
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	

Status Reporting Structure for the DIGital95 Registers

STATUS QUESTIONABLE ERRORS DIGITAL 95

Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	
+600 Messages	6	Bit 6 STATUS QUESTIONABLE ERRORS
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	
Reserved for future use	10	
Reserved for future use	11	
Reserved for future use	12	
Reserved for future use	13	
MUI Maskable Message	14	

Status Reporting Structure for the DIGital 2000 Registers

STATUS QUESTIONABLE ERRORS DIGITAL 2000

Extension Bit	0	Bit 7 STATUS QUESTIONABLE ERRORS
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	
Reserved for future use	10	
Reserved for future use	11	
Reserved for future use	12	
Reserved for future use	13	
MUI Maskable Message	14	

STATUS OPERATION CALL DIGITAL 2000

Extension Bit	0	Bit 7 STATUS OPERATION CALL
F-SCH Synchronized	1	

STATUS OPERATION NMRREADY DIGITAL 2000

Extension Bit	0	Bit 7 STATUS OPERATION NMRREADY
Handoff Waveform Quality	1	
Code Channel Time and Phase	2	
TDSO Frame Error Rate	3	

Status Reporting Structure for the CDMA Registers

STATUS QUESTIONABLE ERRORS CDMA

Extension Bit	0
+100 Messages	1
+200 Messages	2
+300 Messages	3
+400 Messages	4
+500 Messages	5
+600 Messages	6
+700 Messages	7
+800 Messages	8
+900 Messages	9
Reserved for future use	10
Reserved for future use	11
Reserved for future use	12
Reserved for future use	13
MUI Maskable Message	14

Bit 8
STATUS
QUESTIONABLE
ERRORS

STATUS QUESTIONABLE CALL CDMA

Extension Bit	0
Traffic channel preamble not received	1
Service Option or Radio Configuration rejected by MS	2
Service connect completion not received	3
Call drop timer timed out	4
Reserved for future use	5
Reserved for future use	6
Reserved for future use	7
Reserved for future use	8
Reserved for future use	9
Reserved for future use	10
Reserved for future use	11
Reserved for future use	12
Reserved for future use	13
MUI Maskable Message	14

Bit 8
STATUS
QUESTIONABLE
CALL

STATUS OPERATION NMRREADY CDMA

Extension Bit	0	
DA Power	1	Bit 8 STATUS OPERATION NMRREADY
WQuality	2	
C Power	3	
CFError	4	
CAPower	5	
TROPower	6	
GPOwer	7	
CTXSpurious	8	

Status Reporting Structure for the TA 2000 Registers

STATUS QUESTIONABLE ERRORS TA 2000

Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	Bit 9 STATUS QUESTIONABLE ERRORS
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	
Reserved for future use	10	
Reserved for future use	11	
Reserved for future use	12	
Reserved for future use	13	
MUI Maskable Message	14	

STATUS QUESTIONABLE CALL TA 2000

Extension Bit	0	
Release order not received	1	Bit 9 STATUS QUESTIONABLE CALL
Handoff completion not received	2	
Carrier not detected on new channel	3	
MS reject order received	4	
Reserved for future use	5	
Reserved for future use	6	
Reserved for future use	7	
Reserved for future use	8	
Reserved for future use	9	
Reserved for future use	10	
Reserved for future use	11	
Reserved for future use	12	
Reserved for future use	13	
MUI Maskable Message	14	

STATUS OPERATION NMRREADY TA 2000

Reserved for future use
Reserved for future use
Reserved for future use
Reserved for future use

0
1
2
3

Bit 9
STATUS
OPERATION
NMRREADY

Status Reporting Structure for the FDD Registers

STATUS QUESTIONABLE ERRORS FDD

Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	Bit 2 STATUS QUESTIONABLE ERRORS
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	
MUI Maskable Error	14	

STATUS OPERATION NMRREADY FDD

Extension Bit	0	
Thermal Power	1	Bit 2 STATUS OPERATION NMRREADY
Adjacent Channel Leakage	2	
Waveform Quality	3	
Channel Power	4	
Bit Error	5	

Status Reporting Structure for the WCDMA Registers

STATUS QUESTIONABLE ERRORS FDD

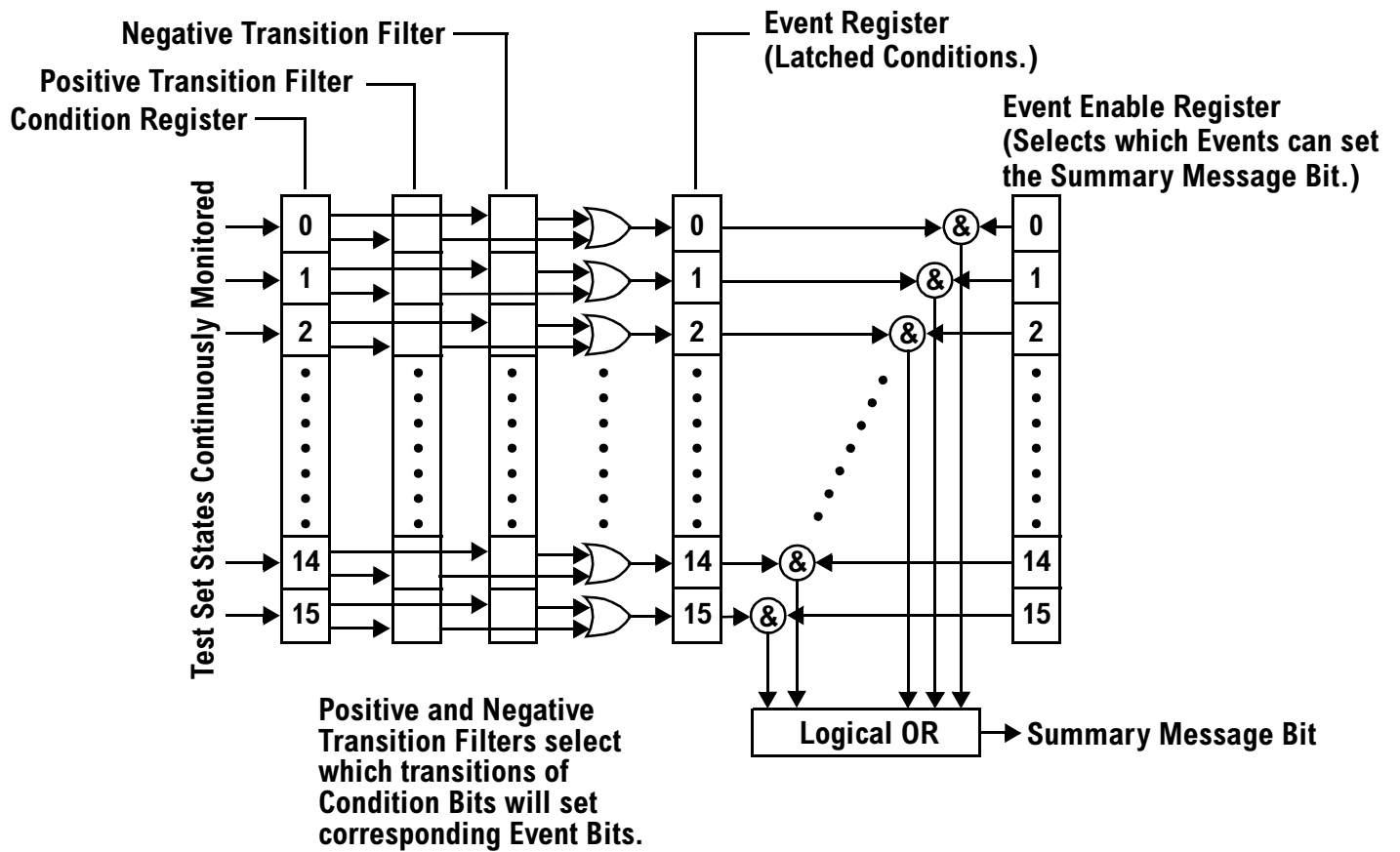
Extension Bit	0	
+100 Messages	1	
+200 Messages	2	
+300 Messages	3	
+400 Messages	4	
+500 Messages	5	Bit 2 STATUS QUESTIONABLE ERRORS
+600 Messages	6	
+700 Messages	7	
+800 Messages	8	
+900 Messages	9	
MUI Maskable Error	14	

STATUS OPERATION NMRREADY WCDMA

No bits are defined at this time	0	Bit 2 STATUS OPERATION NMRREADY
	1	
	2	
	3	
	4	
	5	
	6	

Status Data Structure - Register Model

The generalized status register model consists of a Condition Register, Transition Filters, an Event Register, an Enable Register, and a Summary Message Bit.



Condition Register

A condition is a test set state that is either TRUE or FALSE (a GPIB command error has occurred or a GPIB command error has not occurred). Each bit in a Condition Register is assigned to a particular test set state. A Condition Register continuously monitors the hardware and firmware states assigned to it. There is no latching or buffering of any bits in a Condition Register; it is updated in real time. Condition Registers are read-only. Condition Registers in the test set are 16 bits long and may contain unused bits. All unused bits return a zero value when read.

Transition Filters In the test set, the Transition Filters are implemented as two registers: a 16-bit positive transition (PTR) register and a 16-bit negative transition (NTR) register.

For each bit in the Condition Register, a Transition Filter bit determines the state transitions which will set a corresponding bit in the Event Register. Transition Filters may be set to pass positive transitions (PTR), negative transitions (NTR) or either (PTR or NTR). A positive transition refers to a condition bit which has changed from 0 to 1. A negative transition refers to a condition bit which has changed from 1 to 0.

A positive transition of a bit in the Condition register will be latched in the Event Register if the corresponding bit in the positive transition filter is set to 1. A positive transition of a bit in the Condition register will not be latched in the Event Register if the corresponding bit in the positive transition filter is set to 0.

A negative transition of a bit in the Condition register will be latched in the Event Register if the corresponding bit in the negative transition filter is set to 1. A negative transition of a bit in the Condition register will not be latched in the Event Register if the corresponding bit in the negative transition filter is set to 0. Either transition (PTR or NTR) of a bit in the Condition Register will be latched in the Event Register if the corresponding bit in both transition filters is set to 1. No transitions (PTR or NTR) of a bit in the Condition Register will be latched in the Event Register if the corresponding bit in both transition filters is set to 0.

Transition Filters are read-write.

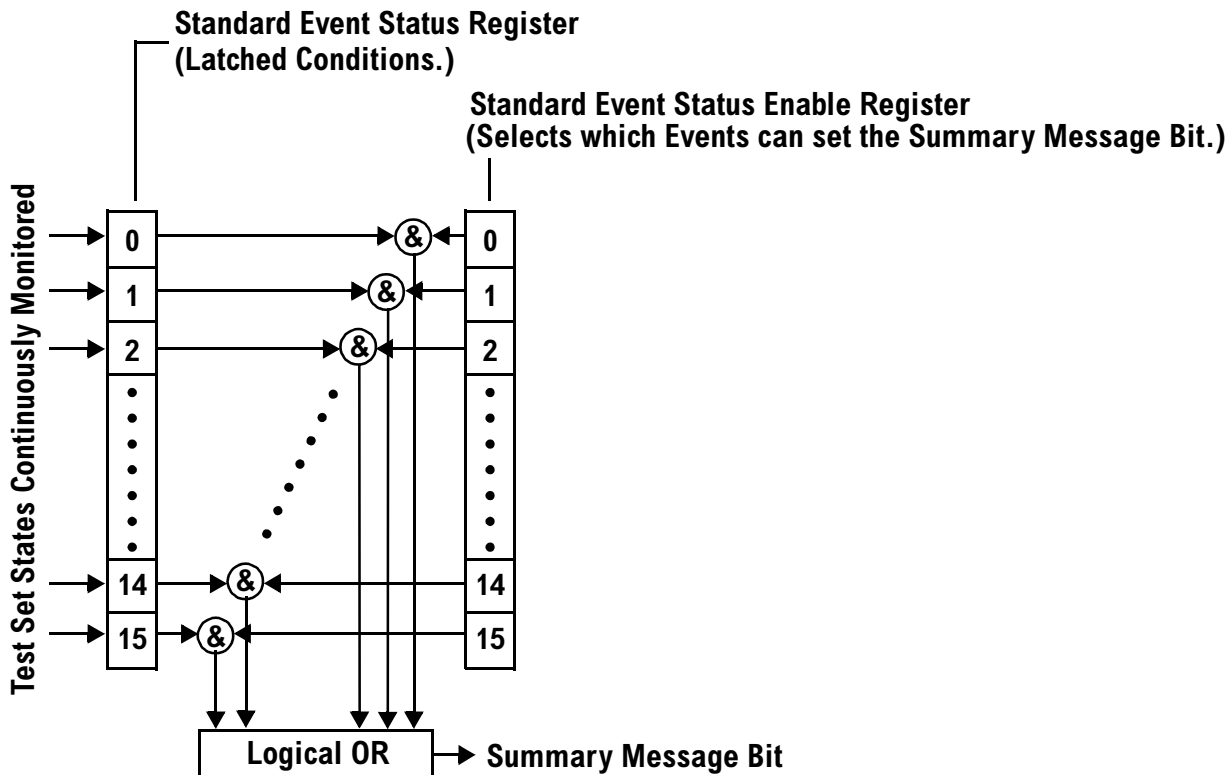
Transition Filters are unaffected by a *CLS (clear status) command.

Transitions Filters are set to pass positive transitions (all 16 bits of the PTR register are set to 1 and all 16 bits of the NTR register are set to 0) at power on or after receiving the *RST (reset) command.

Event Register The Event Register captures bit-state transitions in the Condition Register as defined by the Transition Filters. Each bit in the Event Register corresponds to a bit in the Condition Register. Bits in the Event Register are latched, and, once set, they remain set until cleared by a query of the Event Register or a *CLS (clear status) command. This guarantees that the application can't miss a bit-state transition in the Condition Register. There is no buffering; so while an event bit is set, subsequent transitions in the Condition Register corresponding to that bit are ignored. Event Registers are read-only. Event Registers in the test set are 16 bits long and may contain unused bits. All unused bits return a zero value when read.

Event Enable Register The Event Enable Register defines which bits in the Event Register will be used to generate the Summary Message. Each bit in the Enable Register has a corresponding bit in the Event Register. The test set logically ANDs corresponding bits in the Event and Enable registers and then performs an inclusive OR on all the resulting bits to generate the Summary Message. By using the enable bits the application program can direct the test set to set the Summary Message to the 1 or TRUE state for a single event or an inclusive OR of any group of events. Enable Registers are read-write. Enable Registers in the test set are 16 bits long and may contain unused bits which correspond to unused bits in the associated Event Register. All unused bits return a zero value when read and are ignored when written to. Enable Registers are unaffected by a *CLS (clear status) command or queries.

Standard Event Status Register Model

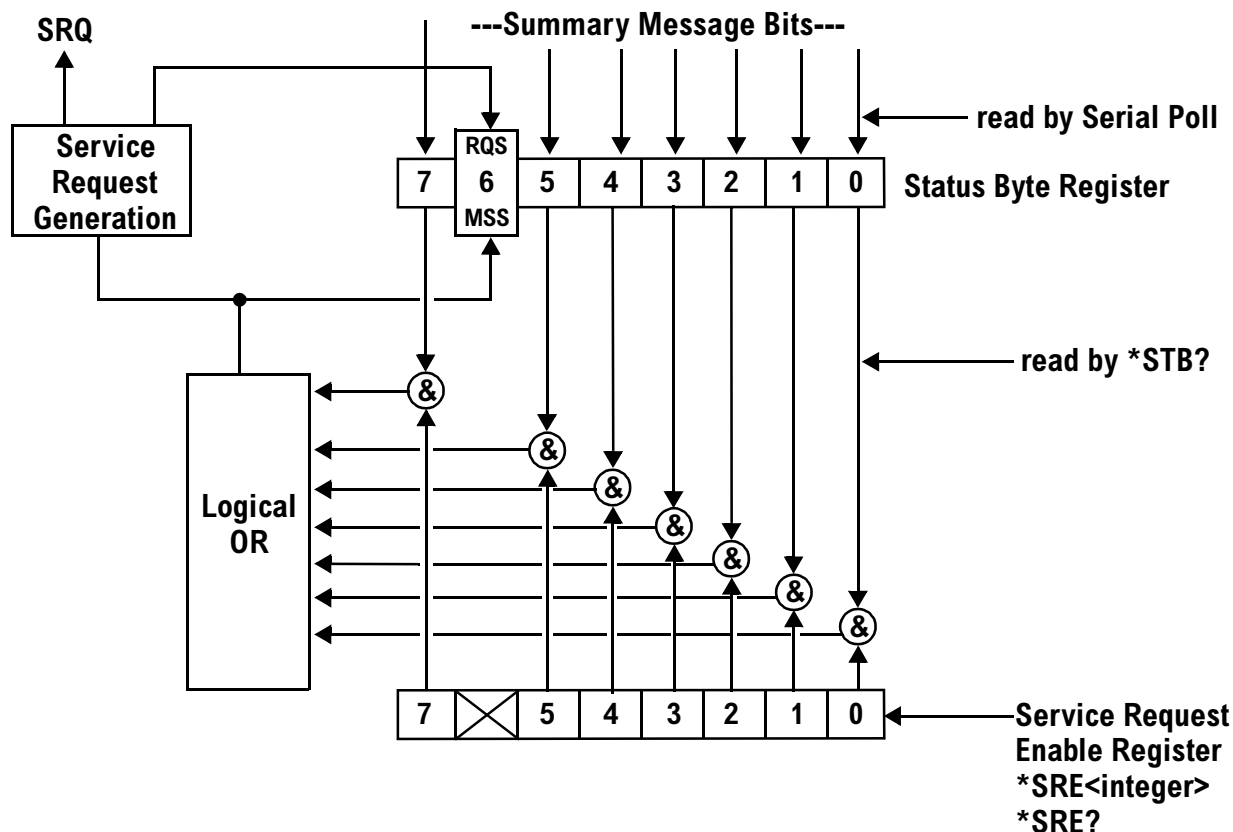


Summary Message Bit The Summary Message is a single-bit message which indicates whether or not one or more of the enabled events have occurred since the last reading or clearing of the Event Register. The test set logically ANDs corresponding bits in the Event and Enable registers and then performs an inclusive OR on all the resulting bits to generate the Summary Message. By use of the enable bits, the application program can direct the test set to set the Summary Message to the 1, or TRUE, state for a single event or an inclusive OR of any group of events.

The Summary Message is TRUE, logic 1, if the register contains some information and an enabled event in the Event Register is set TRUE.

The Summary Message is FALSE, logic 0, if the queue is empty and no enabled events are TRUE. Registers can be cleared by reading all the information from the queue. Registers can also be cleared using the *CLS (clear status) command.

Service Request Enabling Register Model



Status Byte Register The Status Byte Register is an 8 bit register that provides single bit summary messages, each summary message summarizes and overlaying status data structure. Summary messages always track the current status of the associated status data structure. Service request enabling determines if one or more of the summary messages will generate a message. Device status reporting is defined in IEEE 488.2-1992, 11.1.

The Status Byte Register contains the STB and RQS (or MSS) messages from the test set. The Status Bute Register can be read with either a serial poll or the *STB? common query. The value for bit 6 is dependent on which method used.

When reading with a serial poll the status byte and the RQS message are returned as a single data byte. The RQS message indicates if the SRQ is TRUE. The Status Byte Register is not affected by a serial poll, the RQS is set to FALSE when polled.

The *STB? query allows you to read the status byte and the MSS. The response represents the sum of the binary weighted values of the Status Byte Register from bit 0-5 and 7.

The Master Summary Status (MSS) message from bit 6 indicates when there is at least one reason for requesting service.

The Message Available (MAV) summary message from bit 4 is TRUE when there is a message in the output queue.

The Status Byte Register is cleared with the *CLS common command. The output queue and the MAV are not affected by the *CLS command.

Service Request Enable Register The Service Request Enable Register is an 8 bit register that enables corresponding summary messages in the Status Byte Register. Enabling the service request with the *SRE command allows you to choose which bits in the Status Byte Register will trigger a service request.

The Service Request Enable Register is read with the *SRE? query. The returned value is the sum of the binary weighted values of the Service Request Enable Register, with a range of 0 through 63 or 128 through 191.

The value of the unused bit 6 will always be zero.

System Synchronization Bit Bit 12 of the status operation condition register is “pulsed” when the SYSTem:SYNChronized command is sent. This allows the status system to indicate that:

- the input buffer is synchronized to the point where this command is parsed
- all prior sequential commands are completed
- all prior overlapped commands have started

Related Topics

[“STATus Subsystem” on page 316](#)

Concurrent Measurements

Description

A number of measurements can be initiated (with the INITiate command) while other measurements are being made, and the test set will perform as many operations simultaneously as its architecture allows. This technique is referred to as concurrency. Performing measurements concurrently can greatly improve test throughput.

Operating Considerations

The test set has three parallel signal paths to improve measurement throughput.

- Demodulation downconverter path.
- Measurement downconverter path.
- Power detector path.

Since measurements are DSP (digital signal processor) based, and there are four A/D converters available to digitize or “sample” the input signal for analysis by the DSP, the test set will always have the capability to perform one transmitter measurement, one receiver measurement, and maintain the radio link concurrently. The test set’s ability to perform multiple transmitter, or multiple receiver tests concurrently will depend on the availability of resources within the test set and availability of the signal to be tested.

Concurrent Measurements For The E1963A Test Application

This table shows the concurrency considerations for the E1963A W-CDMA Mobile Test Application .

Table 4.

Measurement	Thermal Power	Channel Power	Adjacent Channel Leakage Ratio (ACLR)	Waveform Quality	Loopback BER
Loopback BER	Yes	Yes	Yes	Yes	_____
Waveform Quality	Yes	No	No	_____	Yes
Adjacent Channel Leakage Ratio (ACLR)	Yes	No	_____	No	Yes
Channel Power	Yes	_____	No	No	Yes
Thermal Power	_____	Yes	Yes	Yes	Yes

Table Key:

- **Yes** - the pair of measurements can be initiated simultaneously and the measurements are performed concurrently, resulting in decreased test times.
- **No** - the pair of measurements can be initiated simultaneously, however, the measurements are performed serially.

Related Topics

[“Block Diagram”](#)

Measurement Timeouts

Description

The primary use of measurement timeouts is to regain control of the test set's GPIB in cases where the bus could potentially "hang."

The time normally required for a measurement to complete may vary greatly depending on the individual measurement, its settings, its multiple measurement count value, and so forth. Because of this, you may need to set the timeout longer than the default for measurements where a large number of multiple measurements are requested or where measurement triggers may be infrequent.

Be careful when setting a timeout that is shorter than the default. It is possible to specify a timeout that is so short the measurement does not even have a chance to begin. Measurement timeouts should always be at least several seconds long.

Timeout units default to S (seconds). The seconds suffix is an optional part of the command. If you want MS (milliseconds), US (microseconds) or NS (nanoseconds), you must specify these units in the suffix.

Timeout Values

All measurements in the CDMA 2000 Mobile Test application default to a timeout value of 10 seconds, except FER. The FER measurement timeout default is 200 seconds.

Related Topics

["Integrity Indicator"](#)

["SETup Subsystem"](#)

Measurement Progress Report

Description

The measurement progress report is a query of how far along a multi-measurement cycle has progressed. When the multi-measurement count is greater than one, the measurement progress report will indicate the number of measurements that have completed. The returned value will be the last update and not the actual number, because the value is updated periodically and not for each multi-measurement cycle. Every measurement has the measurement progress report available.

Programming Example

```
OUTPUT 714;"FETCh:WACLeakage:ICount?" !Returns the approximate number of
!Adjacent Leakage Ratio (ACLR) measurements completed while using
!multi-measurements.
```

Related Topics

["Statistical Measurement Results"](#)

Triggering of Measurements

Description

- “Trigger Source Description”
- “Triggering Process Description”
- “Trigger Arm (Single or Continuous) Description”
- “Trigger Delay Description”
- “Trigger Qualifier Description”

Trigger Source Description

A measurement trigger causes hardware (for example, a sampler) to capture data which is used by a measurement algorithm to produce a measurement result. Not all of the trigger source choices are available in every measurement, or every test application.

RF Rise Trigger Source: When RF rise triggering is selected, a measurement dependent threshold is used to define the trigger point on the envelope of the signal being measured. The envelope amplitude must fall below this threshold and remain there for a measurement-dependent period of time before the trigger is armed. After the trigger is armed, a trigger will occur as the envelope amplitude increases and passes through the threshold.

Protocol Trigger Source: When protocol triggering is selected, a data capture is triggered by a protocol generated signal. The test set's protocol engine knows when the DUT's signal should be present and generates a trigger signal for use by the measurement to trigger the data capture.

External Trigger Source: When external triggering is selected, the user supplies an external trigger signal via the rear panel TRIG IN connector in order to trigger data capture. The trigger will occur on the rising edge of this signal.

Immediate Trigger Source: When immediate triggering selected, the trigger occurs as soon as any pre-trigger samples required by the measurement algorithm are taken. Data capture is triggered when the measurement is initiated.

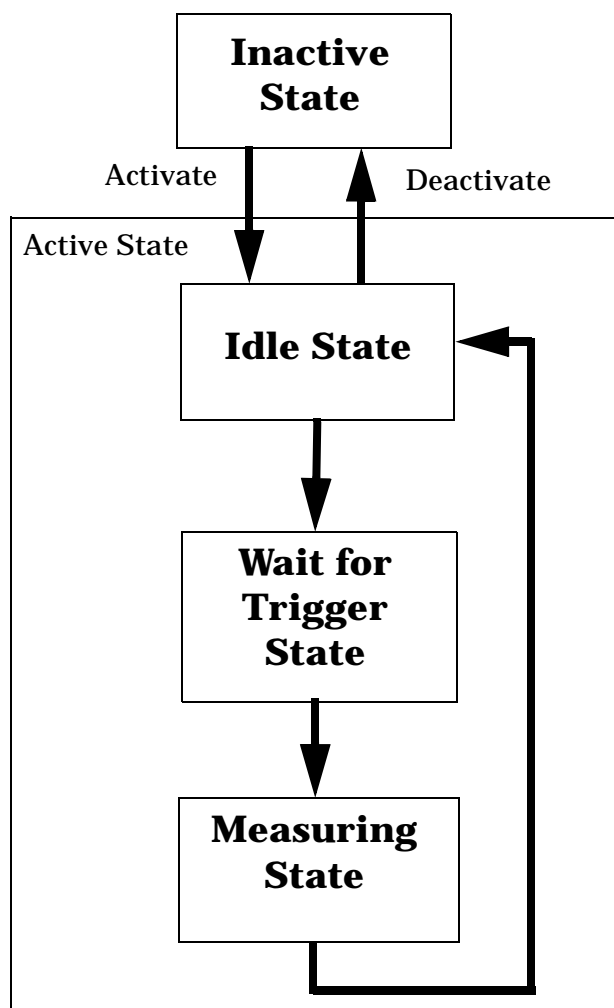
Auto Trigger Source: When auto triggering is selected, the test set automatically chooses the best trigger source for that measurement. This trigger source setting is convenient because the measurement trigger doesn't need to be changed when switching parameters. Auto trigger source is the best choice for most users.

Triggering Process Description

The triggering process controls the present and future states of the test set during the measurement cycle. Triggers are set up using the SETup commands and can be set up when a measurement is in the inactive state. A measurement is activated (selected) with an INITiate command. If a measurement is initiated while in its measurement cycle, it will terminate that measurement and restart it. The active state is not a single state but a collection of any state other than the inactive state. Deactivating (de-selecting) the measurement is accomplished through an INITiate:<MEAS>:OFF command.

Manually, a measurement is activated by selecting it from the Measurement Selection menu. A measurement is deactivated by pressing the Measurement Selection key, scrolling to measurement in the Measurement Selection menu, and then pressing F4 (Close Measurement).

Figure 12. The Test Set's Measurement States



Measurement States

The following examples describe states of the test set under various conditions. Refer to [Figure 12. on page 149.](#)

Example 17. Inactive State

If the test set has just been powered on, or any form of preset has been performed, then the measurement state is inactive.

Example 18. Wait for Trigger State

If a measurement has been initiated with the INITiate command but has not been triggered, or a measurement has been selected from the Measurement Selection menu but has not been triggered, then the measurement state is wait for trigger.

Example 19. Measuring and Idle States (Trigger Arm Single)

If the trigger arm is set to single, the trigger source is available, and the trigger qualifier (optional) is satisfied, the measurement state transitions to measuring and measurement results are now available to the user. The state then transitions to idle (awaiting another INITiate).

Example 20. Measuring State (Trigger Arm Continuous)

If the trigger arm is set to continuous, the trigger source is available, and the trigger qualifier (optional) is satisfied, the measurement state transitions to measuring and measurement results are now available to the user. The measurement is continually triggered until the measurement is deactivated. Measurement results are only available after the measurement completes and before it rearms. The measurement is deactivated using the INITiate:<MEAS>:OFF. or Close Measurement.

Trigger Arm (Single or Continuous) Description

Trigger arm determines if a measurement will make one measurement then return to idle (single), or automatically rearm on completion of a measurement and repeat the process (continuous).

NOTE	<p>When operating the test set remotely, the recommended setting for the trigger arm parameter is single. This ensures proper operation of the INIT:DONE? query which is used to control the retrieval of measurement results when measurements are initiated concurrently.</p> <p>When a continuously armed measurement gets a result, it is available to any currently pending (waiting, hanging) FETCh? query. Then another measurement cycle is started immediately. At this point the results are no longer valid. The INIT:DONE? query is used to determine when there is a completed measurement with valid results that can be fetched. If you look for a continuously armed measurement with valid results that can be fetched using INIT:DONE? then you are unlikely to get anything but WAIT. Each time the Test Set is queried, it is 99% likely to be making another measurement. Even if it did return a measurement name, by the time the control program determines which FETCh? query to send, it is too late to fetch the results and the FETCh? query just hangs until the next measurement cycle is done, nullifying the efficiency provided by the INIT:DONE? query.</p>
-------------	---

Pressing the Start Single key on the front panel will cause all currently active measurements with trigger arm set to single to arm and make the measurement.

Pressing Shift, Start Single (Stop) causes all measurements with trigger arm set to single to abort the measurement.

It is unnecessary for you to arm a measurement if the trigger arm is set to continuous. When in continuous mode, the measurement is automatically rearmed after completing a measurement.

Table 5. Trigger Arm Default Settings

Action	Trigger Arm Default Setting
Power up of test set	Continuous
Manual Full Preset	Continuous
*RST (Remote) Full Preset	Single
Partial Preset	No change

Trigger Delay Description

Trigger delay controls the delay time between the trigger and the start of sampling. Resolution is 1 nanosecond per measurement and the units are in seconds. A negative value indicates the sampling should occur prior to the trigger. The default is zero seconds which is preferred for most measurements.

Trigger Qualifier Description

When the trigger qualifier is on, the test set samples the input signal when a trigger is received. It then determines if the input signal was valid by looking at its power level. If the power level during sampling did not meet the requirements of a valid signal, the state returns to wait for trigger without processing the samples. Trigger qualifier is available for GSM/GPRS TX Power and Phase Frequency Error measurements only.

If a valid signal is present, then it is qualified, and the samples are processed.

Related Topics

[“Integrity Indicator”](#)

Statistical Measurement Results

Description

Most measurements have a setup window that provides for the entry of a multi-measurement count value. This specifies how many measurements the test set will perform to obtain a set of values from which to calculate the following statistical measurement results:

- Average (arithmetic mean) of measurement set
- Minimum value from measurement set
- Maximum value from measurement set
- Standard Deviation of measurement set

Operating Considerations

The advantages of using the multi-measurement feature to obtain statistical measurement data include: reduced time associated with GPIB bus traffic, and reduced time configuring hardware. This is because the number of measurements specified in the multi-measurement count value are performed during one measurement cycle.

Programming Example

```
OUTPUT 714;"SETUP:WACLeakage:COUNT 10" !Enters an Adjacent Channel  
!Leakage Ratio (ACLR) count of 10, and turns the multi-measurement  
!count state on.
```

Related Topics

[“Measurement Progress Report”](#)

Integrity Indicator

November 14, 2001

Description

The test set can evaluate its own performance and make a determination as to the validity of a measurement result. The test set evaluates the conditions surrounding a measurement and reports to the user its evaluation of these conditions in a parameter called the measurement integrity indicator. A measurement integrity indicator value is returned for every completed measurement. It is recommended that the user take advantage of this feature in every measurement.

The returned value defines whether or not a problem was encountered by the measurement process. It is not, however, guaranteed to be the only or root cause of the measurement problem. This is because some of the conditions surrounding a measurement may interact, and the test set may have insufficient information to determine the root cause of the measurement problem. However, in most cases, the value returned is the most likely cause of the problem.

Not all of the integrity indicator values are available for each measurement or test application, if a value doesn't apply it will not be available.

Example: Questionable Result for PGSM (15) and Questionable Result Due To Channel Mode (16) are GSM only integrity indicator values.

NOTE GSM and GPRS measurements return integrity indicators (8, 9, 11) when the measurement synchronization is set to midamble.

Table 6.

Integrity Indicator Number	Integrity Indicator Message
0	Normal: Indicates the measurement completed successfully without error and the result is accurate.
1	No Result Available: Indicates that there is no measurement result and returns NAN (not a number).
2	Measurement Timeout: Indicates that a measurement has timed out. The measurement timeout state must be set to ON.
3	Hardware Not Installed: Indicates that a piece of hardware is not installed in the test set, or the hardware has failed in a way which leads the instrument controller to believe it isn't installed.
4	Hardware Error: Indicates that a hardware failure has occurred. These include failures such as a phase lock loop out-of-lock, defective DSP samplers, or power detectors that can not be calibrated.
5	Over Range: Indicates that the input signal is over range. The amplitude of the device-under test's (DUT's) signal is causing the voltage at a DSP sampler to be above its maximum input level or the frequency is too high or the voltage measured is beyond the maximum voltmeter range, either positive or negative.

Table 6.

Integrity Indicator Number	Integrity Indicator Message
6	Under Range: Indicates that the input signal is under range. The amplitude of the DUT's signal is not high enough for the DSP sampler to produce accurate results with the measurement algorithm.
7	Burst Short: Indicates that the burst duration is too short, or part of the burst was not sampled due to improper triggering.
8	Trigger Early or Fall Early: Indicates that the DUT's burst amplitude fell prematurely or, due to an early trigger (early relative to a transmitted burst) the measurement sampling operation terminated before the falling edge of the burst.
9	Trigger Late or Rise Late: Indicates that either the rising edge of the DUT's burst was late or, due to a late trigger (late relative to a transmitted burst) the measurement sampling operation didn't start until after the rising edge of the transmitted burst.
10	Signal Too Noisy: Indicates that the measurement algorithm has found the signal measured to be too noisy to provide accurate results.
11	Sync Not Found: Indicates that the midamble was not found therefore the measurement was not synchronized.
12	Oven Out of Range: Indicates that a temperature controlled oven (other than the internal timebase oven) is outside of its operating range. The power meter's oven is checked and its condition reported with this value. (The internal timebase generates a temporary error message (out of lock) that is sent to the system error queue and the display. This is not an integrity indicator value, it is an error message.)
13	Unidentified Error: Indicates errors which are not covered by the other integrity values. Examples include: parameter errors, algorithm memory errors (too many measurements), measurements unavailable (unable to control), autorange unable to converge, default calibration data used.
14	PCM Full Scale Warning: Indicates that the PCM signal has reached plus or minus full scale. The measurement made will be accurate on the PCM signal but would typically indicate an overdriven or oscillating element in the DUT.
15	Questionable Result for PGSM: Indicates that the user attempted to make an FBER measurement in a phase 1 system. FBER is only possible in a phase 2 GSM system. This indicator is available only when the selected broadcast band is PGSM.
16	Questionable Result Due To Channel Mode: Indicates that the channel mode was set to Enhanced Full Rate Speech while a Decoded Audio measurement was active. Decoded Audio is not supported for EFR Speech.

Table 6.

Integrity Indicator Number	Integrity Indicator Message
17	<p>Can not Correlate: Indicates that the test sets internally generated reference signal does not correlate with the received signal.</p> <p>Some conditions that could cause this integrity indicator result include the following:</p> <ul style="list-style-type: none"> • an input signal that is corrupted • the input signal is extremely distorted • the input signal is off by more than 10 ms. • the frequency of the input signal deviates more than allowed • something is wrong with the long-code mask coming from the mobile ID
18	<p>Frequency Out Of Range: Indicates that a Channel Power Measurement was attempted at a frequency for which there is no calibration data. The test set display will indicate 4 dashes.</p>
19	<p>Uncalibrated Due To Temperature: Indicates that the current temperature of the test set is different than the calibration data temperature by more than ± 10 degrees C, when attempting a Channel Power Measurement.</p>
20	<p>Potential Receiver Saturation: Indicates that an input signal immediately prior to the measured input was high enough to potentially saturate the receiver hardware.</p>
21	<p>Parameter Error: Indicates that a measurement setup parameter has been set in a way that gives invalid measurement results.</p>
22	<p>Unsupported Configuration: Indicates that some parameter, other than a measurement setup parameter has been set so that it causes an invalid measurement result. Typically this would be a base station emulator parameter.</p>
23	<p>Call Processing Operation Failed: Indicates that a call processing operation, (base station emulator) needed in the course of making the measurement could not complete.</p>

Example Program

```

10 OUTPUT 714;"INITiate:DAPower" !Start Digital Average measurement
20 OUTPUT 714;"FETCH:DAPower?" !Request measurement results.
30 ENTER 714;Integrity,Tx_power !Read measurement results.
40 IF Integrity = 0 THEN !Permits measurement to be printed if integrity indicator
50             !indicates a successful measurement
60 PRINT "Analog TX Power =";Tx_power!if 0 then measurement was successful
70 ELSE
80 PRINT "Measurement integrity questionable, integrity value = ";Integrity !If
90                                     !integrity
100                                    !not zero
110                                    !then print
120                                    !integrity
130                                    !value.

```

Integrity Indicator

```
140 END IF  
150 END
```

Related Topics

[“Error Messages”](#)

Invalid Measurement Results

Description

Invalid measurement results are returned by the test set when conditions such as signal level are not within the present measurement range. Three different invalid measurement results are provided in order to help you understand the condition that caused the invalid result.

- $9.9E+37$ = INFINITY (Infinity)
- $-9.9E+37$ = NINF (Negative Infinity)
- $9.91E+37$ = NAN (Not A Number)

$9.9E+37$ (INFINITY)

$9.9E+37$ is returned by the test set when the measurement is out of range and results are far above the present measurement range.

$-9.9E+37$ (NINFINITY)

$-9.91E+37$ is returned by the test set when the measurement is out of range and results are far below the present measurement range.

$9.91E+37$ (NAN)

$9.91E+37$ is returned by the test set when the measurement is out of range but it can not be determined if measurement results are far above, or far below the measurement range.

If a measurement exceeds its measurement timeout value before a valid result is determined, $9.91E+37$ is returned.

FETCH? and READ? Invalid Results

When a FETCH? or READ? query is performed on a measurement with invalid results, the integrity indicator returns a value of 1, indicating No Result Available.

Manual Users Invalid Results

Manual users will generally see four dashes , "----" on the test set display. When the measurement timeout value has been exceeded, "Measurement Timeout" is displayed as well as the four dashes.

Dealing With Semicolon Separated Response Data Lists

Description

In accordance with IEEE 488.2-1992 Section 8.4.1 the test set uses the semicolon (;) as the response message unit separator (RMUS). The RMUS separates sequential response message unit elements from one another when multiple response message unit elements are sent in a response message. This condition would occur when combining multiple queries into a single GPIB transaction.

Query Response Data Types Used By Test Set

The test set can return the following data types in response to queries:

- character data (char): ASCII characters A-Z (65-90 decimal), underscore (95 decimal), digits (48-57 decimal).
- string data: ASCII characters enclosed in quotes (for example, "5551212" or "PGSM")
- numeric response data (nr1): numeric data in the form +/- dddddddd
- numeric response data (nr3): numeric data in the form +/- ddd.ddd E +/- dddd

Semicolon Separated Response Data Lists Containing Mixed Data Types

Problems can occur when trying to enter semicolon separated response data lists containing mixed data types.

For example: If the following command string is sent to the test set, the test set will respond by constructing a response message which contains multiple response message unit elements (that is, one response message unit element for each query item contained in the command string). Some response message unit elements are string data type, some are character data type and some are nr3 data type.

```
OUTPUT 714;"CALL:MS:REP:IMSI?;PCL?;REV?;SBAN?;ONUM?;MCC?;MNC?;LAC?"
```

An example response message generated by the test set in response to the above OUTPUT statement would be:

```
"001012345678901";+4.00000000E+000;PHAS1;"PGSM";"5551212";9.91E37;9.91E37;9.91E37
```

Constructing the following data entry statement will account for multiple responses from the query:

```
ENTER 714;Imsi$,Pcl,Rev$,Sban$,Onum$,Mcc,Mnc,Lac
```

In the Basic programming environment the above ENTER statement will fail with an 'Insufficient data for ENTER' error. Some programming languages, Basic for example, cannot use the semicolon character as a data item terminator for string variables. In this example Basic will attempt to enter data into Imsi\$ until it sees a LF (line feed) data item terminator. The test set does not send the LF until all the data has been sent. Consequently when Basic sees the LF it terminates entry of data into Imsi\$ and starts to look for data to enter into Pcl. Since the test set is no longer sending any data the error message 'Insufficient data for ENTER' is generated.

One possible workaround is to enter all the data into a single string variable, replace all semicolons with line feeds and then enter the data from the string into the individual data items. For example:

```
DIM Response$(500)
!
!
OUTPUT 714;"CALL:MS:REP:IMSI?;PCL?;REV?;SBAN?;ONUM?;MCC?;MNC?;LAC?"
ENTER 714;Response$
Semicolon=POS(Response$,";")
WHILE Semicolon
Response$(Semicolon,Semicolon)=CHR$(10)
Semicolon=POS(Response$,";")
END WHILE
ENTER Response$;Imsi$,Pcl,Rev$,Sban$,Onum$,Mcc,Mnc,La
```

Semicolon Separated Response Data Lists Containing Only Numeric Data Types

Semicolon separated response data lists containing only numeric data types do not present the types of problem associated with semicolon separated response data lists containing mixed data types. The number building routines in most languages will use any non-numeric character (that is, anything other than +/- 0123456789 E.) as the data item terminator. Consequently when the number building routines encounter the semicolon the data item is terminated. The following example illustrates this:

```
OUTPUT 714;"FETCH:TXP:INT?;POW:MIN?;MAX?"
ENTER 714;Integrity,Min_power,Max_power
```

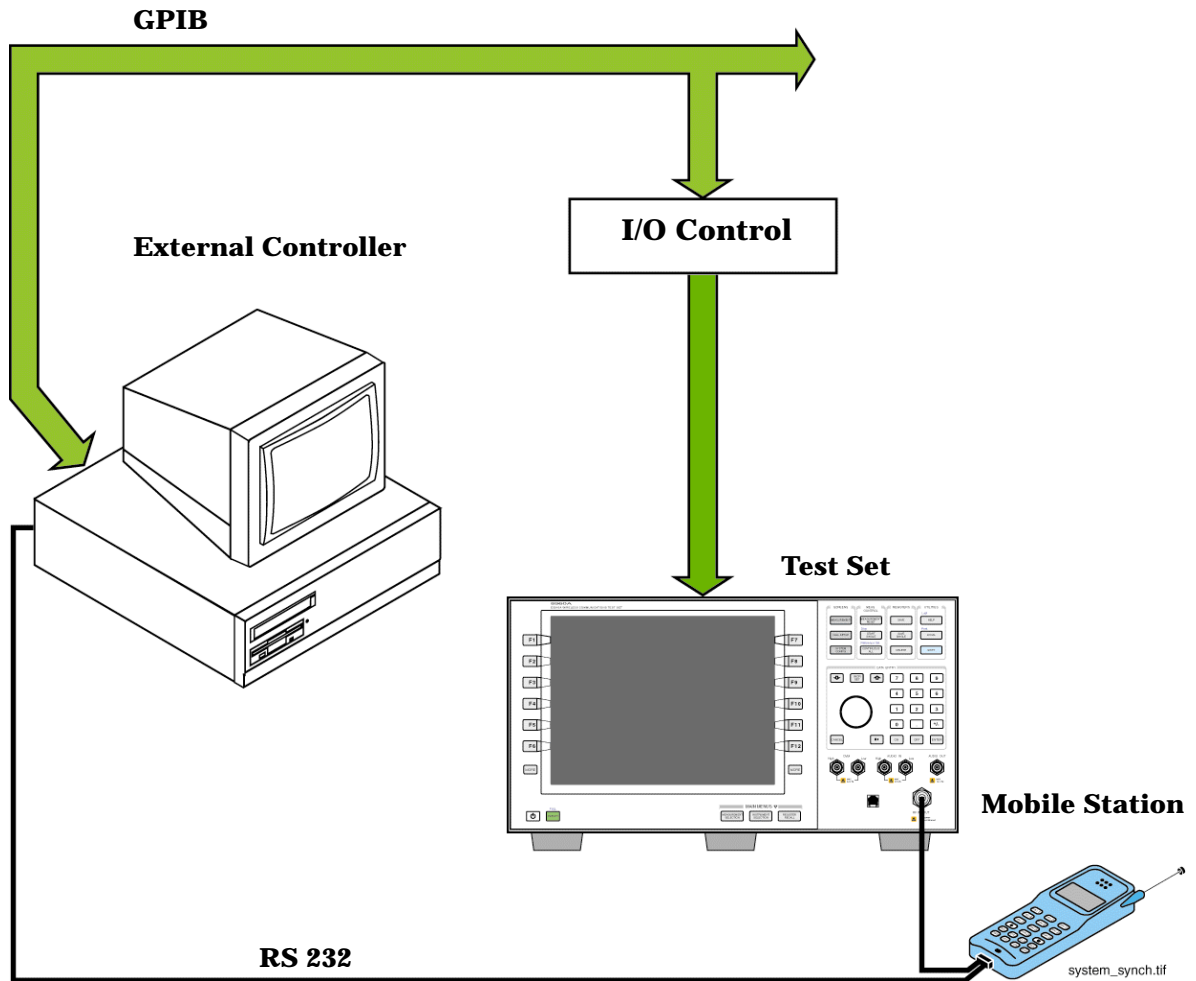
Test System Synchronization Overview

Description

Typical test systems include an external controller with a GPIB connection to the test set, an RF (and possible AF) connection between the test set and a mobile station under test, and a serial connection between the mobile station and the external controller.

Synchronizing an external controller with the test set and a mobile station under test ensures that no device does something before it is supposed to, which can cause errors, or does something well after it could have, which wastes time.

Figure 13. Test System



Sequential versus overlapped commands

The test set uses both sequential and overlapped commands:

- Sequential commands must finish executing before the next command starts to execute.
- Overlapped commands do not finish executing before the next command starts to execute.

Overlapped commands are more difficult to synchronize because an overlapped operation that started several commands earlier may still be executing as subsequent commands are being parsed out from the input buffer and executed. This can present a problem unless the external controller is properly synchronized to the test set's execution of commands. Overlapped commands allow the test set to use its internal resources as efficiently as possible.

Methods for synchronization

The test set's GPIB command set supports the following methods to achieve synchronization for overlapped commands. In some cases, combinations of these methods will provide the best results:

Methods one and two do not require the external controller to query the test set, nor to perform any branching or decision-making associated with information acquired from the test set.

Methods three through six rely on responses from the test set to an external controller, indicating that some event has occurred. The external controller can then make decisions based on these responses to control the flow of commands to the test set and other devices in the test system.

1. Force the test set to execute overlapped commands sequentially.
2. Force the test set to wait until an overlapped command is done executing before executing any more commands.
3. Query the test set to determine when a command has finished executing.
4. Query the test set to determine when all commands sent to it have at least begun executing.
5. Query the test set to determine the current call or data connection processing state.
6. Program the test set to generate a service request when an operation has completed or the test set is in a certain state.

Commands used for synchronization:

- **“CALL:STATus” on page 206**
This command queries the test set's current call processing state. This command supports synchronization method five. See [“Call Processing State Synchronization” on page 1](#).
- **“CALL:STATus” on page 206**
This command determines the connected/idle state of a call. A feature called the change detector provides the user with a way to hold off the response to this query until a call processing state transition has taken place. See [“Connected/Idle Query” on page 2](#). This command supports synchronization method five.
- **:DONE? and :OPC?**
These specialized commands can be appended to call processing overlapped commands to support synchronization method three. See [“Call Processing Subsystem Overlapped Command Synchronization Commands” on page 446](#).
- **:WAIT**
This specialized command can be appended to call processing overlapped commands to support synchronization method two. See [“Call Processing Subsystem Overlapped Command Synchronization Commands” on page 446](#).

- **:SEQ**
This specialized command can be appended to call processing overlapped commands to support synchronization method one.
See [“Call Processing Subsystem Overlapped Command Synchronization Commands” on page 446](#).
- **“INITiate:DONE?” on page 265**
This specialized command causes the test set to return a mnemonic indicating if a measurement is done. If not, the returned mnemonic will indicate if the measurement is still executing. This command supports synchronization method three.
See [“INITiate:DONE?” on page 265](#).
- **STATUS:<register>**
Status bits in the register are provided to indicate the test set’s call processing state. These bits support synchronization methods five and six.
Status bits in the [“STATus:OPERation:NMRReady Register Bit Assignments” on page 334](#) are provided to indicate when a measurement is ready to be fetched. These bits support synchronization method three and six.
Many other status bits are provided in the GPIB status subsystem that are useful for synchronization. See [“STATus Subsystem” on page 316](#).
- **“SYSTem:SYNChronized” on page 405**
This specialized command puts a 1 in the test set’s output queue, the test set responds to the query by sending a 1 to the external controller indicating that all prior sequential commands have completed, and all prior overlapped commands have at least begun execution. The condition bit is set then cleared. See [“STATus:OPERation Register Bit Assignments” on page 325](#). This command supports synchronization four and six.
- **“*OPC” and “*OPC?” on page 410, and “*WAI” on page 411 (not recommended)**
Note: These commands look at all of the test set’s operations collectively. Because multiple processes are likely to be executing at the same time, it is recommended that the other commands above be used instead.

Related Topics

- [“Call Processing State Synchronization” on page 1](#)
- [“Measurement Event Synchronization” on page 164](#)
- [“Call Processing Event Synchronization” on page 445](#)
- [“SYSTem:SYNChronized” on page 405](#)

Measurement Event Synchronization

Description

Measurement event synchronization saves time by controlling the communication between the controller, the test set, and the mobile station, so that no device does something before it is supposed to (which can cause errors or do something well after it could have). Because some measurements can run concurrently, it is necessary that the control program know when individual measurement results are available.

Measurement event synchronization is accomplished using the INITiate subsystem's command INITiate:DONE? or the STATus:OPERation:NMRReady status registers.

INITiate:DONE?

The INITiate:DONE? query returns a string that indicates what, if any, measurements are ready to be fetched. This query should be used inside a loop, checking each measurement that was initiated. See ["INITiate" on page 263](#) for more details about this query.

The INITiate:DONE? query returns at least one of the following indicators for each pass through the loop:

- "CPOW" - The channel power measurement results are available.
- "DAP" - The digital average power measurement results are available.
- "WQU" - The waveform quality measurement results are available
- "WAIT" - There are one or more measurements which are in the measuring state which are not excluded from the query. See ["INITiate:DONE:FLAG:<measurement mnemonic>" on page 266](#). When WAIT is returned at least one measurement is not ready to be fetched yet.
- "NONE" - There are no measurements currently in the measuring state. This assumes no measurements have been excluded. See ["INITiate:DONE:FLAG:<measurement mnemonic>" on page 266](#). This would indicate that all measurements results are available or none have been initiated.

Programming Example

The following example assumes that the mobile is transmitting on a digital traffic channel and no measurements other than digital TX power (DTXP) and digital modulation accuracy (MACC) are being triggered. See [“Transition Filters” on page 140](#).

```

10  OUTPUT 714;"SETup:DAPower:CONTInuous OFF" !Sets digital average power
20                                     !trigger mode to single.
30  OUTPUT 714;"SETUP:WQQuality:CONTInuous OFF" !Sets wavrform quality
40                                     !trigger mode to single.
50  OUTPUT 714;"INITiate:DAPower;WQQuality" !Begin digital average power and
60                                     !waveform quality measurements.
70  REPEAT
80  OUTPUT 714;"INITiate:DONE?" !Queries the test set for measurements
90                                     !that are done
100 ENTER 714;Meas_done$ !String value representing DONE measurements,
110                                     ! NONE if no measurements are done.
120 SELECT Meas_done$ !This variable will be set to WAIT until measurements
130                                     !are DONE.
140 CASE "DAP" !Characters must be upper case.
150 OUTPUT 714;"FETCH:DAPower?" !If this case is selected,
160                                     !digital average power is FETCHed.
170 ENTER 714;Integrity,Dapower_meas
180 PRINT "Digital Average Power is ";Dapower_meas
190 CASE "WQU" !Characters must be uppercase.
200 OUTPUT 714;"FETCH:WQQuality:RHO?" !If this case is selected,
210                                     !the rho measurement is FETCHed.
220 ENTER 714;rho_meas
230 PRINT "Rho is ";rho_meas
240 END SELECT
250 UNTIL Meas_done$="NONE" !When all triggered measurements have completed,
260                                     !the INITiate:DONE? query returns NONE.
270 END

```

Operating Considerations

Only one indicator is returned per query.

To ensure that when a measurement completes it will remain in a state that qualifies it as DONE, use the SETup subsystem to set all active measurements to single (CONTInous:OFF) trigger mode.

GPIB Commands

Diagram Conventions

Description

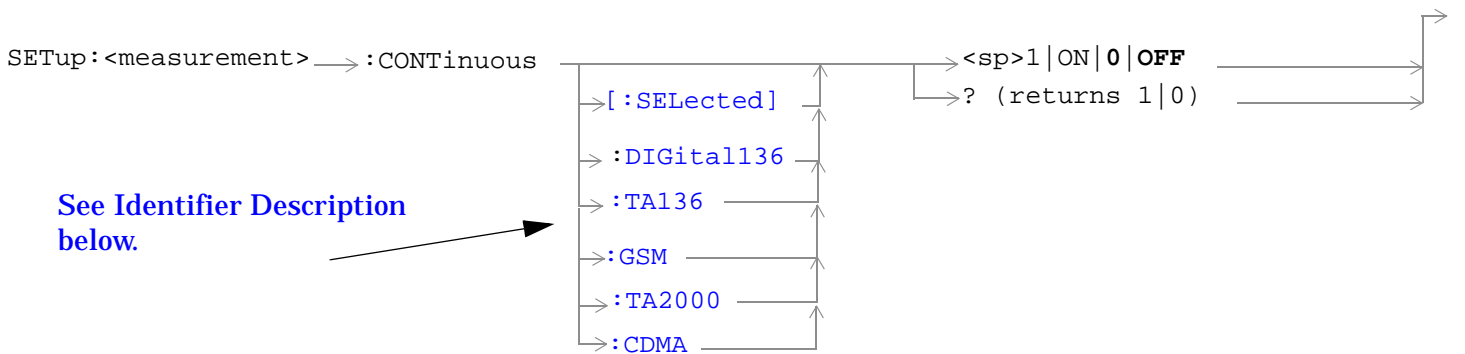
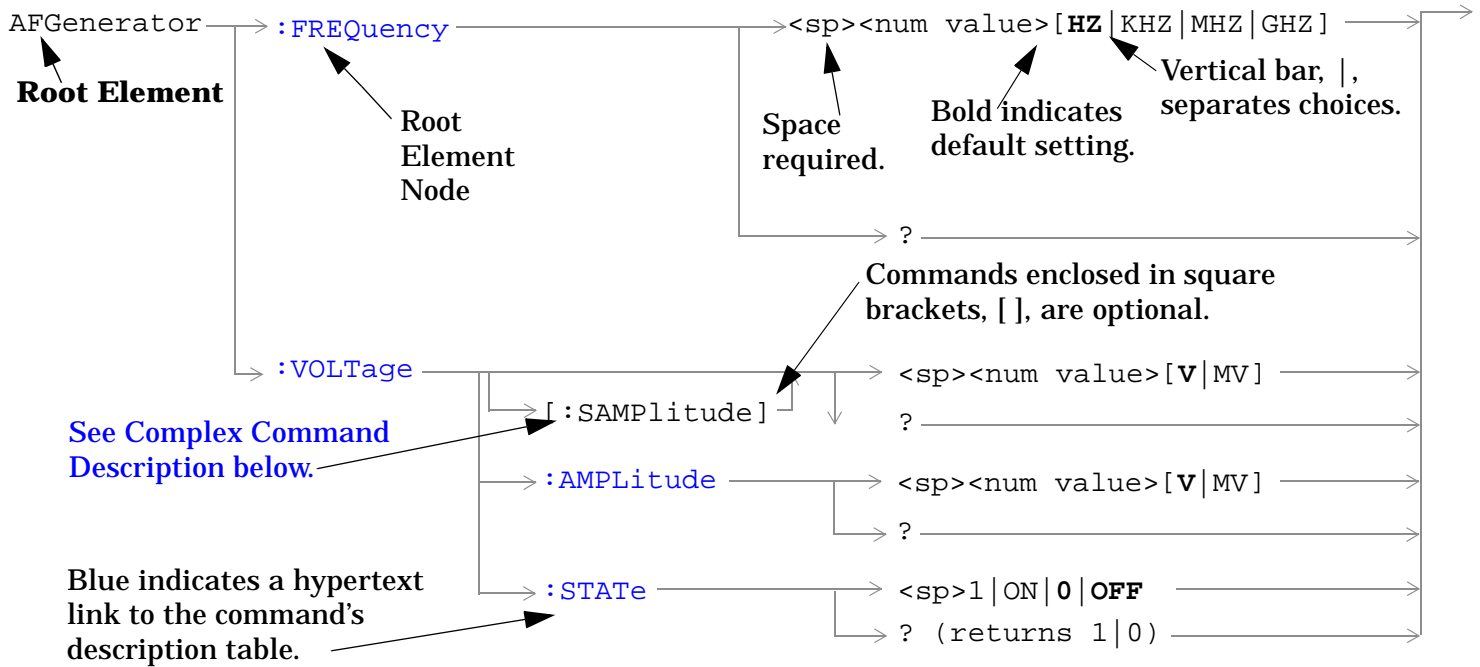


Diagram Description

Statement elements are connected by lines. Each line can be followed in only one direction, as indicated by the arrow at the end of the line. Any combination of statement elements that can be generated by starting at the **Root Element** and following the line the **direction of the arrow** is syntactically correct. The drawings show the proper use of spaces. Where spaces are required they are indicated by **<sp>**, otherwise no spaces are allowed between statement elements.

Complex Command Description

A complex command sets the state of the parameter to ON, and is used to set a value for that parameter. These parameters; amplitude, frequency, gain, number, time, and value can be used as a complex command. Refer to the specific command for the parameter that applies.

Identifier Description

Some test applications are able to test more than one radio format. There may be commands/queries that are shared by more than one radio format in the some of these test applications. Identifiers are used to specify the radio format for the command/query. The command/query is sent to the active radio format if you don't use an identifier. An identifier must be used when sending commands to the inactive radio format.

Developing Code

It is recommended that you set the Test Set's operating environment to debug. To set the Test Set debug mode to "ON" use the following syntax:

```
SYSTem:COMMunicate:GPIB:DEBug ON
```

Units-of-Measure

Amplitude (linear)	V
Frequency	Hz
Power (logarithmic)	dBm
Time	s

ABORt Subsystem

Description

The ABORt command causes a measurement cycle in progress to stop. If the measurement is not being continuously armed (trigger arm set to single) , the measurement will remain in the idle state after this event. If the measurement is being continuously armed (trigger arm set to continuous), a new measurement cycle will begin after ABORt. If an ABORt command is issued from any measurement state other than measuring, the command is ignored.

Other Commands that Execute an ABORt Action

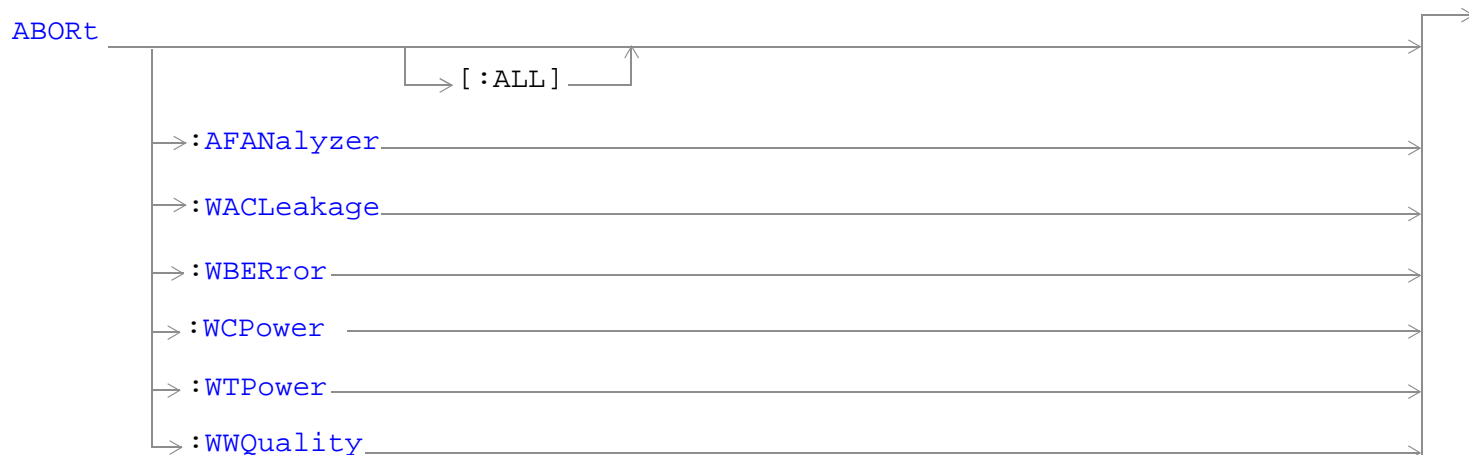
INITiate:<meas> will execute an ABORt:<meas> as part of the INITiate:<meas> command.

READ:<meas>? will execute an ABORt:<meas> action that aborts just one trigger sequence and then combines the INITiate and FETCh? commands.

Syntax Diagram and Command Descriptions

“ABORt”

ABORt



“Diagram Conventions” on page 168

ABORt[:ALL]

Function	<p>Stops all measurements that are active.</p> <p>If the trigger arm is set to single, the measurements will go to the idle state.</p> <p>If the trigger arm is set to continuous, the measurements will re-arm and initiate again.</p>
Setting	<p>Range</p> <ul style="list-style-type: none"> • AFANalyzer - Audio Frequency measurements • WACLeakage - Adjacent Channel leakage • WCPower - Channel Power measurement • WBERror - Loopback Bit Error Ratio measurement • WTPower - Thermal Power measurement • WWQuality - Waveform Quality measurement
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"ABORT:ALL" !Aborts all active measurements in progress.</pre>	

ABORT

ABORT:<meas-mnemonic>

Function	Stops the selected measurement if it is active. If the trigger arm is set to single, the measurements will go to the idle state. If the trigger arm is set to continuous the measurements will re-arm and initiate again.
Setting	Range <ul style="list-style-type: none">• AFANalyzer - Audio Frequency measurements• WACLeakage - Adjacent Channel leakage• WCPower - Channel Power measurement• WBERror - Loopback Bit Error Ratio measurement• WTPower - Thermal Power measurement• WWQuality - Waveform Quality measurement
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"ABORT:WWQUALITY" !Aborts the waveform quality measurements.	

AFGenerator Subsystem

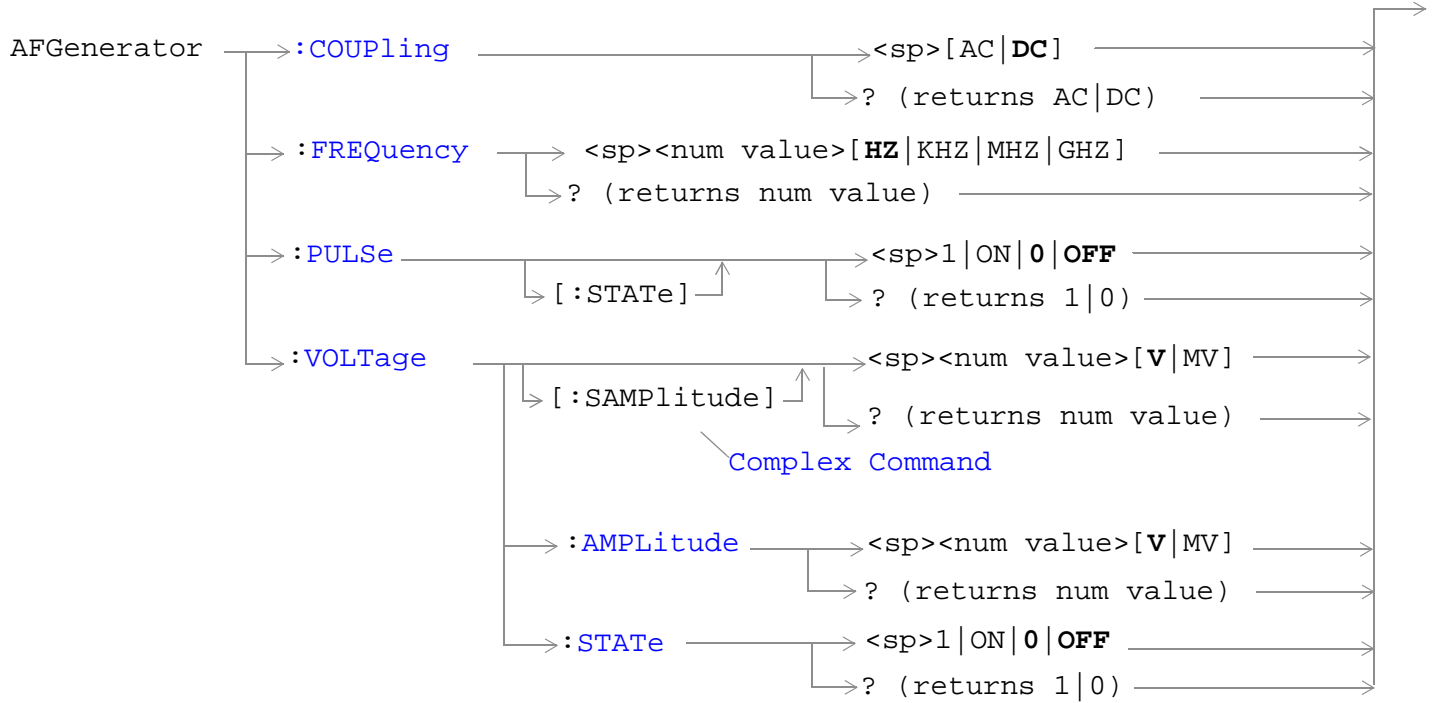
Description

The AFGenerator subsystem is used to control the audio source that is available at the Audio Output connector.

Syntax Diagram and Command Descriptions

[“AFGenerator” on page 174](#)

AFGenerator



[“Diagram Conventions” on page 168](#)

AFGenerator:COUPling

Function	Sets the output of the audio generator to be ac or dc coupled to the front-panel AUDIO OUT port.
Setting	Range: AC or DC
Query	Range: AC DC
*RST setting	DC
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"AFGENERATOR:COUPling AC" !Sets the audio generator coupling to AC.	

AFGenerator:FREQuency

Function	Sets/queries the frequency of the audio generator. The units (HZ KHZ MHZ GHZ) are optional. If no units are specified, then units default to HZ.
Setting	Range: 1 Hz to 20 kHz Resolution:0 .1 HZ
Query	Range: 1 Hz to 20 kHz Resolution: 0.1 Hz
*RST setting	1 kHz
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"AFGENERATOR:FREQUENCY 1000" !Sets the audio generator frequency to 1000 Hz.	

AFGenerator:PULSe[:STATE]

Function	Sets/queries the audio generator pulse state. The pulse state must be on when the test set's audio generator is used for audio stimulation during a decoded audio measurement. When the state is on, the audio signal from the test set is pulsed at a 10 Hz rate with a 50% duty cycle.
Setting	Range: 0 OFF 1 ON
Query	Range: 0 1
*RST setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"AFGENERATOR:PULSE ON" !Sets the audio generator pulse to ON.	

AFGenerator:VOLTage[:SAMPlitude]

Function	Sets /queries the amplitude of the audio generator in volts and turns the state to on. The units (V mV) are optional. If no units are specified, then units default to V.
Setting	Range: 0 to 9 V pk. Resolution: <ul style="list-style-type: none"> • 0.5 mV pk. <= 1 V pk. output • 5 mV pk. > 1 V pk. output
Query	Range: 0 to 9 V pk. Resolution: <ul style="list-style-type: none"> • 0.5 mV pk. <= 1 V pk. output • 5 mV pk. > 1 V pk. output
*RST setting	0 V
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"AFGENERATOR:VOLTAGE 2.1" !Sets the state to on and the output !voltage to 2.1 volts.</pre>	

AFGenerator:VOLTage:AMPLitude

Function	Sets/queries the amplitude for the audio generator when the audio generator state is on. The units (V mV) are optional. If no units are specified, then units default to V.
Setting	Range: 0 to 9 V pk. Resolution: <ul style="list-style-type: none"> • 0.5 mV pk. <= 1 V pk. output • 5 mV pk. > 1 V pk. output
Query	Range: 0 to 9 V pk. Resolution: <ul style="list-style-type: none"> • 0.5 mV pk. <= 1 V pk. output • 5 mV pk. > 1 V pk. output
*RST setting	0 V
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
<pre>OUTPUT 714;"AFGENERATOR:VOLTAGE:AMPLITUDE 1.414" !Sets the audio generator output !voltage to 1.414 volts peak.</pre>	

AFGenerator:VOLTage:STATE

Function	Sets/queries the audio generator state
Setting	0 OFF 1 ON
Query	0 1
*RST setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
<pre>OUTPUT 714;"AFGENERATOR:VOLTAGE:STATE ON" !Set the audio generator state to ON.</pre>	

CALibration Subsystem

Description

There are two calibrations that must be performed periodically on the test set:

- I/Q calibration
- Measurement calibration

Calibration Procedures

- I/Q calibration

This calibration is required if the baseband generator or the vector output modules are serviced or swapped. IQ calibration should not be used as part of frequent (i.e. daily, weekly or monthly) test set calibration.

- Measurement calibration

Measurement calibration takes about two minutes.

During this calibration no power should be applied to the front panel.

This calibration generates calibration data for channel power and waveform quality measurements (see [“Channel Power Measurement Description”](#)).

During calibration the internal temperature of the test set is measured and calibration data is generated for the measurement’s amplitude and frequency ranges.

An integrity bit is set true and is returned with channel power measurement results when the measurement is uncalibrated due to temperature drift. See [“Integrity Indicator”](#) .

Remotely initiating any of the calibration routines is accomplished through the use of single query-only header. The test set returns a numeric value indicating the outcome of the calibration attempt.

Manually initiating the IQ calibration routines requires pressing the SYSTEM CONFIG key, then pressing the 1 of 2 (**More**) key, then pressing the Service (**F7**) key. Manually initiating the measurement calibrations is performed by selecting the measurement and pressing the `Calibrate Measurements` softkey when measuring channel power or waveform quality.

Syntax Diagram and Command Descriptions

[“CALibration”](#)

CALibration

CALibration → :MEASurements? →

[“Diagram Conventions” on page 168](#)

CALibration:MEASurements?

Function	<p>Starts the channel power calibration routine. This calibration is used for the channel power and the adjacent channel leakage ratio measurements.</p> <p>It is important that no power is applied to the RF IN/OUT connector during calibration.</p> <p>Although this command appears to be a query, it performs an immediate action when sent: no information is returned.</p>
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"CALIBRATION:MEASUREMENTS?" !Starts the measurement calibration.</pre>	

CALL Subsystem

Description

The CALL subsystem handles all setup, control, and query functions for call processing. This includes mobile station (MS) and Base Station (cell) functions.

Syntax Diagrams and Command Descriptions

[“CALL:AWGNoise:POWer” on page 181](#)

[“CALL:CHANnel” on page 184](#)

[“CALL\[:CELL\]:CLPControl:UPLink” on page 185](#)

[“CALL\[:CELL\]:CONTRol:DOWNlink:FREQuency:AUTO” on page 186](#)

[“CALL:DPCHannel” on page 187](#)

[“CALL:DTCHannel:DATA” on page 189](#)

[“CALL:FDDTest” on page 190](#)

[“CALL:MS:POWer” on page 196](#)

[“CALL:OCNSource” on page 197](#)

[“CALL\[:CELL\]:OPERating” on page 199](#)

[“CALL:PICHannel” on page 200](#)

[“CALL\[:CELL\]:POWer” on page 201](#)

[“CALL\[:CELL\]:RFGenerator” on page 204](#)

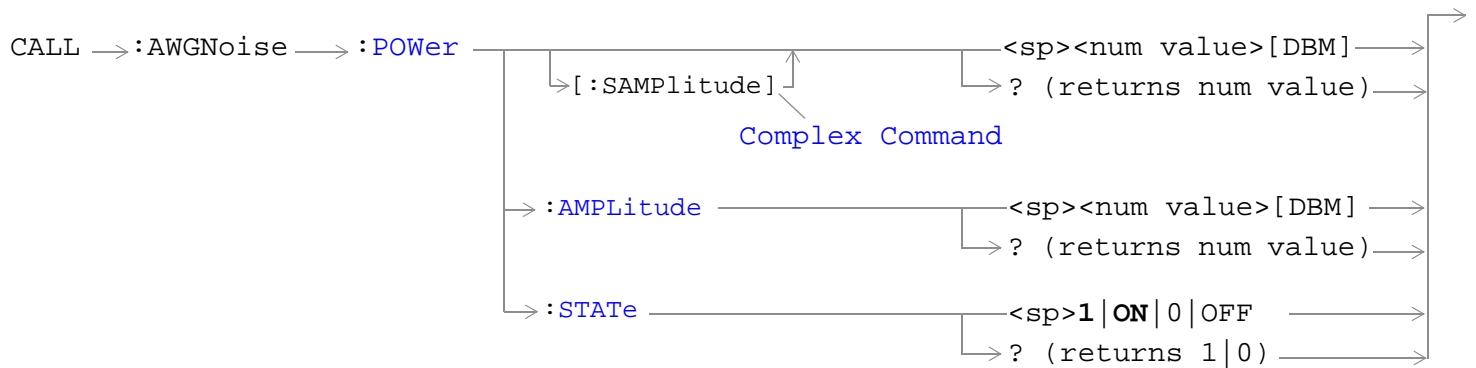
[“CALL\[:CELL\]:SCODE” on page 205](#)

[“CALL:STATus” on page 206](#)

[“CALL:TOTal:POWer” on page 215](#)

[“CALL:UPLink” on page 217](#)

CALL:AWGNoise:POWer



[“Diagram Conventions” on page 168](#)

CALL:AWGNoise:POWer[:SAMPlitude]

Function	<p>The setting form of this command performs two functions: (1) sets the additive white gaussian noise (AWGN) level and (2) turns the AWGN on/off state to on. The query form returns the AWGN power level or NAN.</p> <p>AWGN and cell power (see “CALL[:CELL]:POWer”) are absolute power levels and make up the total forward channel RF output power. Depending on the cell power setting, an AWGN level may be within the range listed below but cause an error message to be displayed. Possible causes are:</p> <ul style="list-style-type: none"> • Sum of AWGN and cell power causing total RF power limits to be exceeded (see “CALL:TOTal:POWer” for the allowable range of total RF power.) • Greater than 10 dB difference between cell power and AWGN. • Amplitude offset causing total RF power limits to be exceeded (see “SYSTEM:CORRection” to set or query the amplitude offset value).
Setting	<p>Range:</p> <ul style="list-style-type: none"> • -170dBm/3.84 MHz to +37dBm/3.84 MHz, 9.91 E+37 <p>(-120 dBm/3.84 MHz to -13 dBm/3.84 MHz actual hardware range with amplitude offset = 0)</p> <p>The actual power range is defined by adding the value of the associated amplitude offset to the range above. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84 MHz.</p> <p>Resolution: 0.01 dBm/3.84 MHz</p>
Query	<p>Range: -170 dBm/3.84 MHz to +35 dBm/3.84 MHz, 9.91 E+37</p> <p>Resolution: 0.01 dBm/3.84 MHz</p>
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"CALL:AWGNOISE:POWER:SAMPLITUDE -30" !Sets the AWGN power level to -30 dBm/3.84 MHz and turns the state on.</pre>	

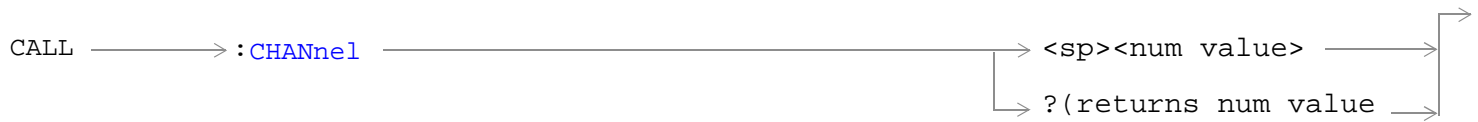
CALL:AWGNoise:POWer:AMPLitude

Function	Sets/queries the additive white gaussian noise (AWGN) level. AWGN and cell power (see “CALL[:CELL]:POWer”) are absolute power levels and make up the total forward channel RF output power. Depending on the cell power setting, an AWGN level may be within the range listed below but cause an error message to be displayed. Possible causes are: <ul style="list-style-type: none"> • Sum of AWGN and cell power causing total RF power limits to be exceeded (see “CALL:TOTal:POWer” for range of total RF power.) • Greater than 10 dB difference between cell power and AWGN. • Amplitude offset causing total RF power limits to be exceeded (see “SYSTEM:CORRection” to set or query the amplitude offset value).
Setting	Range: -120 dBm/3.84 MHz to -15 dBm/3.84 MHz, NAN Resolution: 0.01 dB
Query	Range: -120 dBm/3.84 MHz to -15 dBm/3.84 MHz, NAN Resolution: 0.01 dB
*RST Setting	NAN
Programming Example	
OUTPUT 714;"CALL:AWGNOISE:POWER:AMPLITUDE -30" !Set the AWGN level to -30 dBm/3.84 MHz.	

CALL:AWGNoise:POWer:STAtE

Function	Sets/queries the additive white gaussian noise (AWGN) state. AWGN and cell power (see “CALL[:CELL]:POWer”) are absolute power levels and make up the total forward channel RF output power. Depending on the cell power setting, an AWGN level may be within the range listed below but cause an error message to be displayed. Possible causes are: <ul style="list-style-type: none"> • Sum of AWGN and cell power causing total RF power limits to be exceeded (see “CALL:TOTal:POWer” for range of total RF power.) • Greater than 10 dB difference between cell power and AWGN. • Amplitude offset causing total RF power limits to be exceeded (see “SYSTEM:CORRection” to set or query the amplitude offset value).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	OFF
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"CALL:AWGNOISE:POWER:STATE:SELECTED ON" !Turns on AWGN.	

CALL:CHANnel

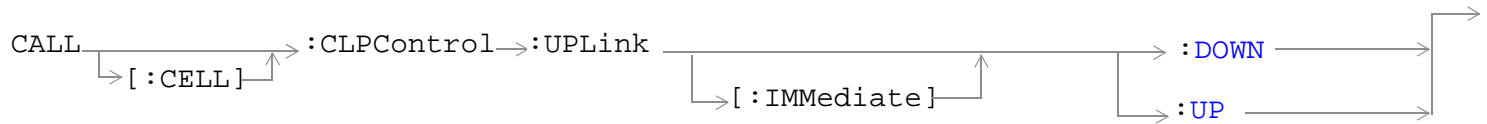


“Diagram Conventions” on page 168

CALL:CHANnel

Function	Sets/queries the downlink channel number (FDD DL UARFCN).
Setting	Range: <ul style="list-style-type: none"> • 4320 - 4495 • 4600 - 4825 • 9000 - 9425 • 9625 - 9975 • 10,525 - 10,875
Query	Range: <ul style="list-style-type: none"> • 4320 - 4495 • 4600 - 4825 • 9000 - 9425 • 9625 - 9975 • 10,525 - 10,875
*RST Setting	9700
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:CHANNEL?" !Queries the downlink channel number.	

CALL[:CELL]:CLPControl:UPLink



[“Diagram Conventions” on page 168](#)

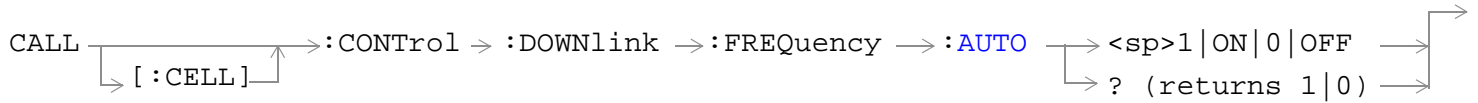
CALL[:CELL]:CLPControl:UPLink[:IMMEDIATE]:DOWN

Function	Sets the uplink inner loop power control to step down power.
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:CELL:CLPCONTROL:UPLINK:IMMEDIATE:DOWN"	

CALL[:CELL]:CLPControl:UPLink[:IMMEDIATE]:UP

Function	Sets the uplink inner loop power control to step up power.
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:CELL:CLPCONTROL:UPLINK:IMMEDIATE:UP"	

CALL[:CELL]:CONTRol:DOWNlink:FREQuency:AUTO

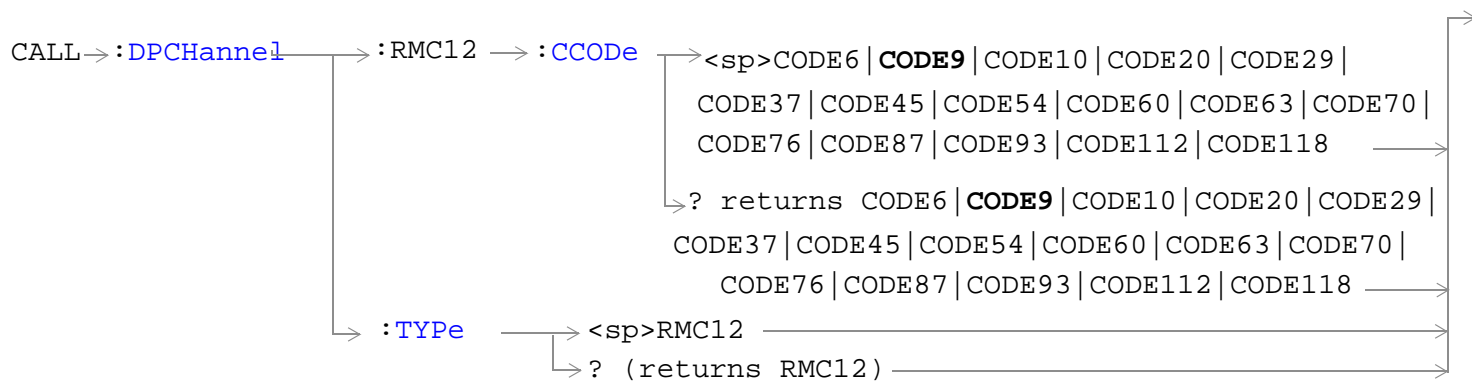


[“Diagram Conventions” on page 168](#)

CALL[:CELL]:CONTRol:DOWNlink:FREQuency:AUTO

Function	Sets/queries whether the user or the base station emulator is in control of the RF generator's downlink channel frequency setting. If set to on (1), the base station emulator is in control and the frequency will automatically be set by the test set. If set to off (0), the downlink channel frequency is directly settable. Refer to “CALL[:CELL]:RFGenerator” to set the downlink channel frequency.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (auto)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:CELL:CONTROL:DOWNLINK:FREQUENCY:AUTO OFF" !Enables manual frequency setting.	

CALL:DPCHannel



[“Diagram Conventions” on page 168](#)

CALL:DPCHannel

CALL:DPCHannel:RMC12:CCODE

Function	Sets/queries the dedicated physical control channel's 12.2 kbps reference measurement channel's channelization code. The type of bearer service being carried by the WCDMA link drives the configuration of the DTCH and DCCH logical channels, the DCH Transport channel, and the DPCH physical channel. The 8960 supports only symmetrical channels, and only one type of bearer service at a time (12.2 kbps RMC).
Setting	Range: CODE6 CODE9 CODE10 CODE20 CODE29 CODE37 CODE45 CODE54 CODE60 CODE63 CODE70 CODE76 CODE87 CODE93 CODE112 CODE118
Query	Range: CODE6 CODE9 CODE10 CODE20 CODE29 CODE37 CODE45 CODE54 CODE60 CODE63 CODE70 CODE76 CODE87 CODE93 CODE112 CODE118
*RST Setting	CODE9
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:DPCHANNEL:SECONDARY:CCODE CODE3" !Sets the 12.2 RMC's channelization code.	

CALL:DPCHannel:TYPE

Function	Sets/queries the dedicated physical control channel's channel type. Only one channel type is supported at this time.
Setting	Range: RMC12
Query	Range: RMC12
*RST Setting	RMC12
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:DPCHANNEL:TYPE RMC12"	

CALL:DTCHannel:DATA

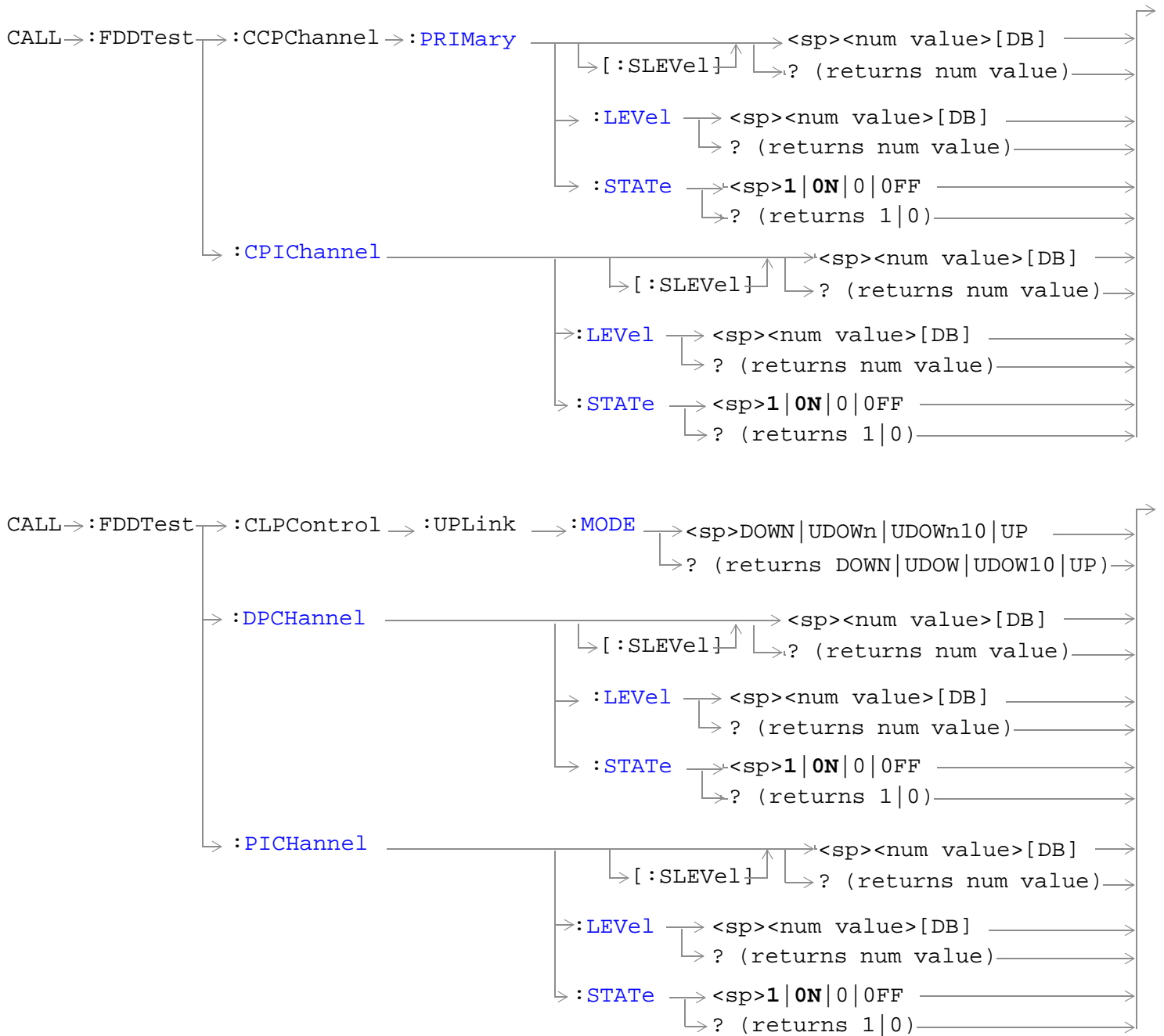
CALL->:DTCHannel ->:DATA

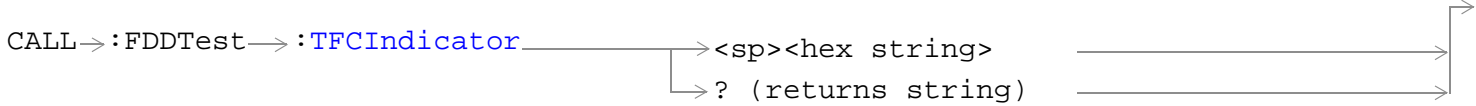
[“Diagram Conventions” on page 168](#)

CALL:DTCHannel:DATA

Function	Sets/queries the downlink dedicated traffic channel's data type. While the DTCH Data is set to ZERos a continuous series of 0's is transmitted on the DTCH. While the DTCH Data is set to ONES a continuous series of 1's is transmitted on the DTCH. While the DTCH Data is set to either PRBS9 (CCITT PN9) or PRBS 15 (CCITT PN15) the appropriate pseudo-random bit sequence is transmitted continuously on the DTCH.
Setting	Range: PRBS9 PRBS15 ONES ZERos
Query	Range: PRBS9 PRBS15 ONES ZER
*RST Setting	PRBS15
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:DTCHANNEL:DATA ZER"	

CALL:FDDTest





“Diagram Conventions” on page 168

CALL:FDDTest:CCPChannel:PRIMary[:SLEVel]

Function	Sets/queries the test mode power offset of the primary common control physical channel . This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB, 9.91 E+37 Resolution: 0.01
Query	Range: -20.00 dB to 0 dB, 9.91 E+37 Resolution: 0.01
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:CCPCHANNEL:PRIMARY:SLEVEL" !Sets P-CCPCH test mode power offset.	

CALL:FDDTest:CCPChannel:PRIMary:LEVel

Function	Sets/queries the primary common control physical channel’s test mode power offset. This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB, 9.91 E+37 Resolution: 0.01
Query	Range: -20.00 dB to 0 dB, 9.91 E+37 Resolution: 0.01
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:CCPCHANNEL:PRIMARY:LEVEL -5"	

CALL:FDDTest

CALL:FDDTest:CLPControl:UPLink:MODE

Function	Sets/queries the uplink inner loop power control mode. When UP is selected, the test set sends all 0 (up) power control bits. When DOWN is selected, the test set sends all 1 (down) power control bits. When UDOWn is selected, the test set sends alternating up/down power control bits. When UDOWn10 is selected, the test set sends alternating 10 up/down power control bits.
Setting	Range: UP DOWN UDOWn UDOWn10
Query	Range:UP DOWN UDOW UDOW10
*RST Setting	UDOW
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:CELL:CLPCONTROL:REVERSE:MODE UDOWn" !Sets the closed loop power control mode to alternating up, down bits.	

CALL:FDDTest:CCPChannel:PRIMary:STATE

Function	Sets/queries the primary common control physical channel's state in test mode.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:FDDTEST:CCPCHANNEL:PRIMARY:STATE ON"	

CALL:FDDTest:CPICannel[:SLEVel]

Function	Sets/queries the test mode power offset of the common pilot channel . This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB Resolution: 0.01
Query	Range: -20.00 dB to 0 dB Resolution: 0.01
*RST Setting	-3.3 dB
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:FDDTEST:CPICANNEL:SLEVEL -10"	

CALL:FDDTest:CPICannel:LEVel

Function	Sets/queries the common pilot channel's test mode power offset. This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB Resolution: 0.01
Query	Range: -20.00 dB to 0 dB Resolution: 0.01
*RST Setting	-3.3 dB
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:CPICHANNEL:LEVEL -5"	

CALL:FDDTest:CPICannel:STATE

Function	Sets/queries the common pilot channel's state in test mode.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:CPICHANNEL:STATE OFF"	

CALL:FDDTest:DPCHannel[:SLEVel]

Function	Sets/queries the test mode power offset of the dedicated physical channel . This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB Resolution: 0.01
Query	Range: -20.00 dB to 0 dB Resolution: 0.01
*RST Setting	-10.3 dB
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:DPCHANNEL:SLEVEL -7"	

CALL:FDDTest

CALL:FDDTest:DPCHannel:LEVEL

Function	Sets/queries the dedicated physical channel's test mode power offset. This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB Resolution: 0.01
Query	Range: -20.00 dB to 0 dB Resolution: 0.01
*RST Setting	-10.3 dB
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:FDDTEST:DPCHANNEL:LEVEL -7"	

CALL:FDDTest:DPCHannel:STATE

Function	Sets/queries the dedicated physical channel's state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:FDDTEST:DPCHANNEL:STATE OFF"	

CALL:FDDTest:PIChannel[:SLEVel]

Function	Sets/queries the test mode power offset of the page indicator channel . This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB Resolution: 0.01
Query	Range: -20.00 dB to 0 dB Resolution: 0.01
*RST Setting	-8.3 dB
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:FDDTEST:CPICHANNEL:SLEVEL -10"	

CALL:FDDTest:PIChannel:LEVel

Function	Sets/queries the page indicator channel's test mode power offset. This command sets the power offset level and turns on the power offset.
Setting	Range: -20.00 dB to 0 dB Resolution: 0.01
Query	Range: -20.00 dB to 0 dB Resolution: 0.01
*RST Setting	-8.3 dB
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:CPICHANNEL:LEVEL -5"	

CALL:FDDTest:PIChannel:STATe

Function	Sets/queries the page indicator channel's state in test mode.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:CPICHANNEL:STATE OFF"	

CALL:FDDTest:TFCIndicator

Function	Sets/queries the transport format combination indicator (TFCI). The TFCI is a hexadecimal string of up to 12 characters. An error message is displayed if the user attempts to enter more characters than fit into the string.
Setting	Range: 0x000 to 0x3FF
Query	Range: 0x000 to 0x3FF
*RST Setting	0x000
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:FDDTEST:TFCINDICATOR 0x2DE"	

CALL:MS:POWer

CALL → :MS → :POWer → :TARGet <sp><num value>[DBM] ?(returns num value)

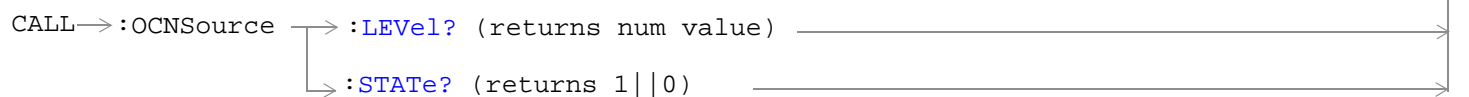
↳[:AMPLitude]

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CALL:MS:POWer:TARGet[:AMPLitude]?

Function	<p>Sets/queries the UE (mobile station) target transmitter power.</p> <p>When operating in FDD test mode, this setting sets the UE expected power into the test set when using automatic receiver control. This setting does not control the UE output power in any way. The user must set this value when making measurements that do not provide autoranging to prevent an over range or an under range measurement situation. See “FDD Test Operating Mode” .</p> <p>When Active Cell operating mode is made available (future test application release): If the uplink closed loop power control is in the active bits mode, the instrument will measure the mobile’s transmit power and it will send the required transmit power control bit patterns to the mobile. This setting does not directly set the transmit power of the mobile, but it will drive the mobile power to the setting if closed loop power is active. As in FDD Test operating mode, this setting has the secondary function of setting the test set’s receiver power level when the receiver power control state is set to AUTO.</p>
Query	Range: -50 dBm to +24 dBm
*RST Setting	24 dBm
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:MS:POWer:TARGet:AMPLitude -20"	

CALL:OCNSource



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CALL:OCNSource:LEVel?

Function	<p>Queries the calculated level of the UTRA FDD composite orthogonal channel noise simulator (OCNS).</p> <p>The OCNS level is a calculated value used to balance the relative power levels of the following channels to sum to 100%:</p> <ul style="list-style-type: none"> • OCNS • Common Pilot Channel (CPICH) • Primary Common Control Physical Channel (P-CCPCH) • Synchronization Channel (SCH) • Page Indicator Channel (PICH) • Dedicated Physical Channel (DPCH) <p>If the contribution of OCNS is calculated to be -30 dB or less, the OCNS state is turned off.</p>
Query	<p>Range: 0 to -29 dB, 9.91 E+37</p> <p>Resolution: 0.01 dB</p>
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"CALL:OCNSOURCE:LEVEL?" !Queries the calculated OCNS level.</pre>	

CALL:OCNSource:STATE?

Function	<p>Queries the on/off state of the calculated UTRA FDD composite orthogonal channel noise simulator (OCNS).</p> <p>The OCNS level is a calculated value used to balance the relative power levels of the following channels to sum to 100%:</p> <ul style="list-style-type: none"> • OCNS • Common Pilot Channel (CPICH) • Primary Common Control Physical Channel (P-CCPCH) • Synchronization Channel (SCH) • Page Indicator Channel (PICH) • Dedicated Physical Channel (DPCH) <p>If the contribution of OCNS is calculated to be -30 dB or less, the OCNS state is turned off.</p>
Setting	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714 ; "CALL : OCNSOURCE : STATE? "	

CALL[:CELL]:OPERating

CALL $\xrightarrow{\text{[:CELL]}}$:OPERating \rightarrow :MODE $\xrightarrow{\text{[:SElected]}}$ <sp> CALL* | CW | FDDTest | OFF* \rightarrow
 ? (returns CALL* | CW | FDDT | OFF*)

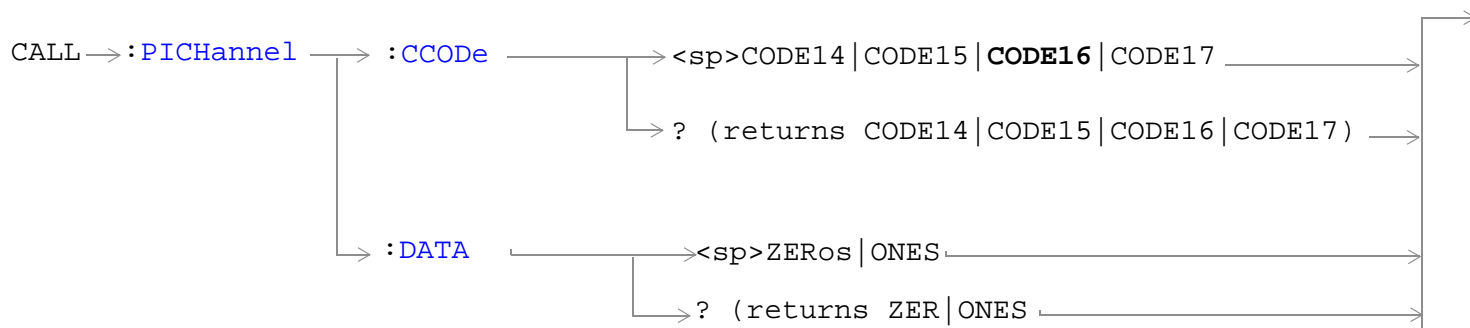
* Not available for this release.

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CALL[:CELL]:OPERating:MODE

Function	Sets/queries the operating mode of the base station emulator. If a call is in progress during a change in operating mode it will be dropped.
Setting	Range: CALL* CW FDDTest OFF* (*Not available for this release.)
Query	Range: CALL* CW FDDT OFF* (*Not available for this release.)
*RST Setting	FDDTest
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"CALL:CELL:OPERATING:MODE FDDTEST" !Selects UTRA FDD test mode.	

CALL:PICHannel



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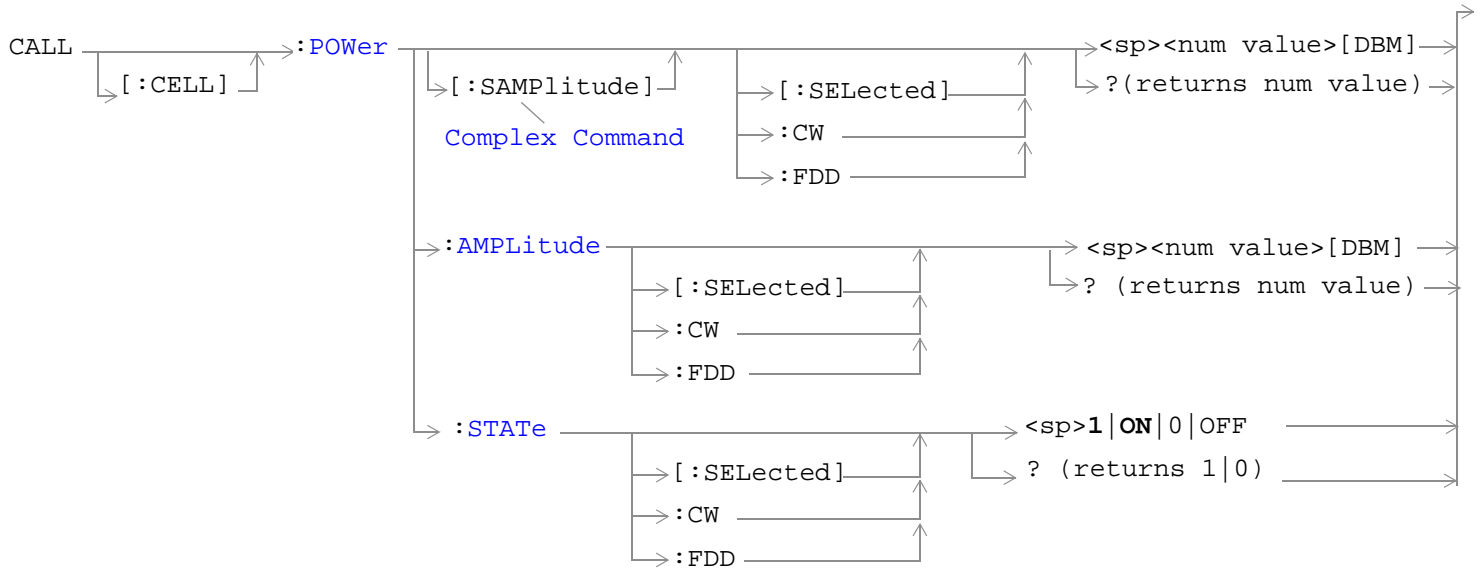
CALL:PICHannel:CCODE

Function	Sets/queries the page indicator channel's channelization code. This setting cannot be changed while in active cell operating mode (when available). Attempting to change this setting while in this mode results in the following error message: "Command Rejected While in Active Cell Mode."
Setting	Range: CODE14 CODE15 CODE16 CODE17
Query	Range: CODE14 CODE15 CODE16 CODE17
*RST Setting	CODE16
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:PICHANNEL:CCODE CODE10"	

CALL:PICHannel:DATA

Function	Sets/queries the page indicator channel data being sent on the downlink. You can send either all ones or all zeros.
Setting	Range: ZERos ONES
Query	Range: ZER ONES
*RST Setting	ZERos
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:PICHANNEL:DATA ONES" !Sends all ones for the paging indicator channel data.	

CALL[:CELL]:POWer



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CALL[:CELL]:POWER

CALL[:CELL]:POWER[:SAMPLitude][:SElected]

Function	<p>The setting form of this command performs two functions: (1) sets the cell power level and (2) turns the cell power on/off state to on. The query form returns the cell power level (including compensation for amplitude offset) or 9.91 E+37.</p> <p>The optional [:SElected] keyword in this command specifies that the cell power level being set or queried applies to the current system type. The current system type can be changed using the "CALL[:CELL]:SYSTem[:TYPE]?" command.</p>
Setting	<p>Range:</p> <ul style="list-style-type: none">-170dBm/3.84 MHz to +37dBm/3.84 MHz, 9.91 E+37 <p>(-120 dBm/3.84 MHz to -13 dBm/3.84 MHz actual hardware range with amplitude offset = 0)</p> <p>The actual power range is defined by adding the value of the associated amplitude offset to the range above. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84 MHz.</p> <p>Resolution: 0.01 dBm/3.84 MHz</p>
Query	<p>Range: Same as setting range.</p> <p>Resolution: 0.01 dB</p>
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"CALL:CELL:POWER:SAMPLITUDE -30" !Sets the cell power state to ON and sets RF output power to -30 dBm.</pre>	

CALL[:CELL]:POWER:AMPLitude[:SElected]

Function	Sets/queries the cell power level (including compensation for amplitude offset). The optional [:SElected] keyword in this command specifies that the cell power level being set or queried applies to the current system type. The current system type can be changed using the "CALL[:CELL]:SYSTem[:TYPE]?" command.
Setting	Range: <ul style="list-style-type: none"> -170dBm/3.84MHz to +37dBm/3.84MHz, 9.91 E+37 (-120 dBm/3.84MHz to -13 dBm/3.84MHz actual hardware range with amplitude offset = 0) The actual power range is defined by adding the value of the associated Amplitude Offset to the range in the table. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84MHz. Resolution: 0.01 dBm/3.84 MHz
Query	Range: Same as setting range. Resolution: Same as setting range.
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"CALL:CELL:POWER:AMPLITUDE -30" !Sets the cell power level -30 dBm.</pre>	

CALL[:CELL]:POWER:STATE[:SElected]

Function	Sets/queries the cell power state. The optional [:SElected] keyword in this command specifies that the cell power state being set or queried applies to the current system type. The current system type can be changed using the "CALL[:CELL]:SYSTem[:TYPE]?" command.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	ON
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"CALL:CELL:POWER:STATE OFF" !Turns off cell power.</pre>	

CALL[:CELL]:RFGenerator

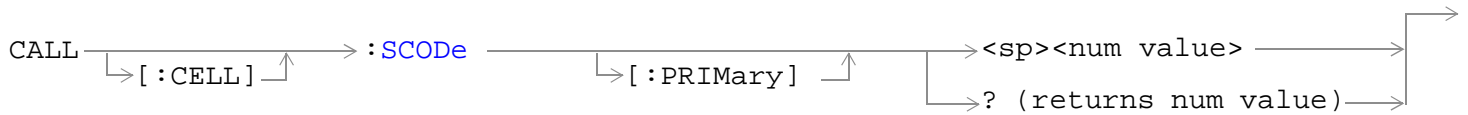
CALL → [:CELL] → :RFGenerator → :FREQUENCY → <sp><num value>[HZ|KHZ|MHZ|GHZ] → ? (returns num value)

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CALL[:CELL]:RFGenerator:FREQUENCY

Function	Sets/queries the RF generator downlink channel frequency. If no units are specified the setting defaults to Hz. The test set will tune to the frequency entered using this command when the “CALL[:CELL]:CONTROL:DOWNlink:FREQUENCY:AUTO” command is set to manual.
Setting	Range: 292 MHz to 2700 MHz Resolution: 0.1 Hz
Query	Range: 292 MHz to 2700 MHz Resolution: 0.1 Hz
*RST Setting	851 MHz
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:CELL:RFGENERATOR:FREQUENCY 450 MHZ" !Sets the downlink channel frequency to 450 MHz.	

CALL[:CELL]:SCODE

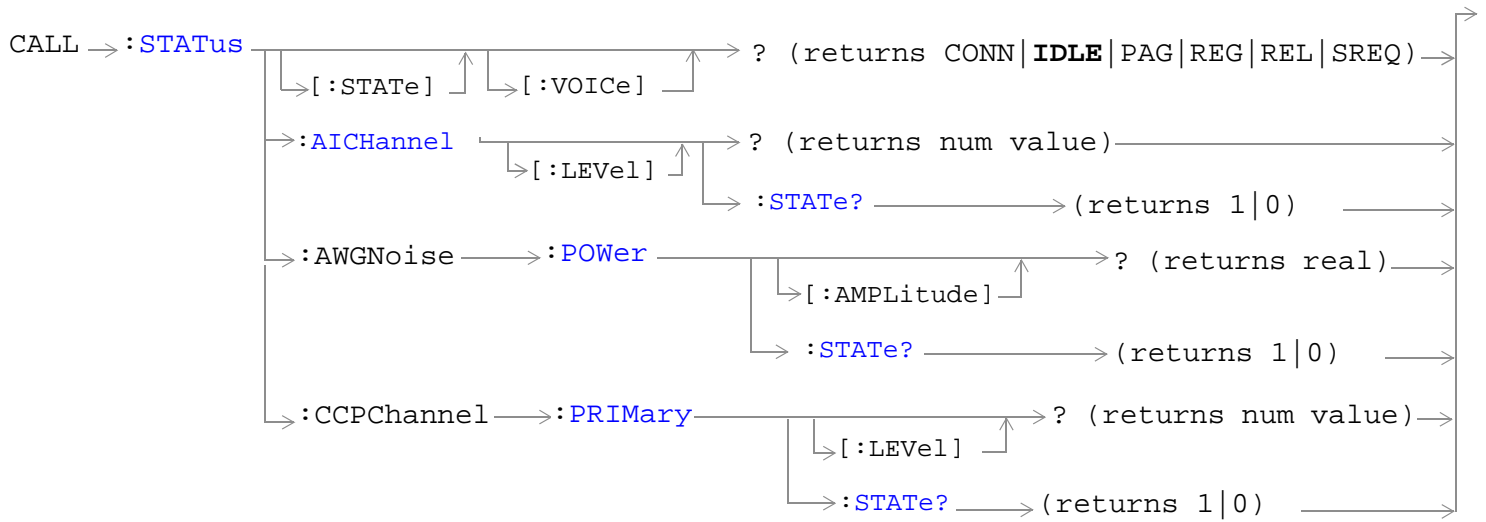


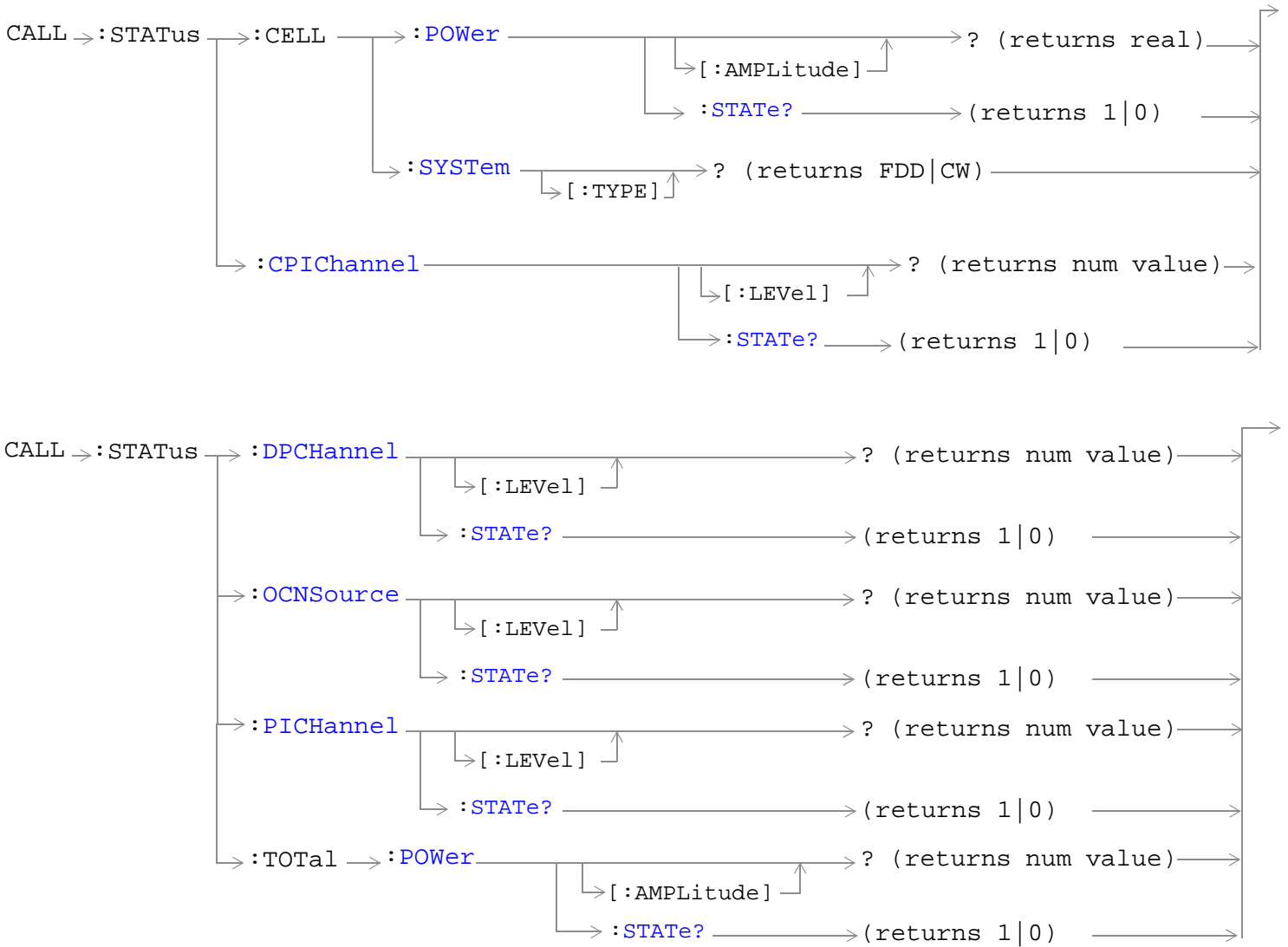
[“Diagram Conventions” on page 168](#)

CALL[:CELL]:SCODE

Function	<p>Sets/queries the primary scrambling code.</p> <p>The actual code number for the primary scrambling code is 16 times the value of this setting. See 3GPP TS 25.213, "Spreading and Modulation (FDD)" for a complete description of the relationship between this index and the actual spreading code number.</p> <p>This setting cannot be changed while the active cell operating mode (when available). Attempting to change this setting while in this mode will result in the following error message: "Command Rejected While in Active Cell Mode."</p>
Setting	Range: 0 to 511
Query	Range: 0 to 511
*RST Setting	1
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:CELL:SCODE 10" !Sets the primary scrambling code to 10.	

CALL:STATUS





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CALL:STATUS

CALL:STATUS[:STATE]?

Function	Queries the status of the call. Status can be connected, idle, paging, registering, releasing, or setup.
Query	Range: CONN IDLE PAG REG REL SREQ Only IDLE is returned in FDD Test operating mode.
*RST Setting	IDLE
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:STATUS?" !Returns the current call processing state.	

CALL:STATUS:AICHannel[:LEVEL]?

Function	Queries the current level of the acquisition indicator channel. This setting is not used in FDD Test operating mode.
Query	Range: -20.00 to 0 dB, 9.91 E+37 Resolution: 0.01 dB
*RST Setting	9.91 E+37
Requirements	Test Application Revision: (future release with Active Cell operating mode)
Programming Example OUTPUT 714; "CALL:STATUS:AICHANNEL:LEVEL?"	

CALL:STATUS:AICHannel:STATE?

Function	Queries the current state of the acquisition indicator channel. This setting is not used in FDD Test operating mode.
Query	Range: 0 1
*RST Setting	0 (off)
Requirements	Test Application Revision: (future release with Active Cell operating mode)
Programming Example OUTPUT 714; "CALL:STATUS:AICHANNEL:STATE?"	

CALL:STATUS:AWGNoise:POWER[:AMPLitude]?

Function	Queries the current power level of the additive white Gaussian noise (AWGN) source. AWGN power level is set using the " CALL:AWGNoise:POWER " commands.
Query	<p>Range:</p> <ul style="list-style-type: none"> -170dBm/3.84 MHz to +37dBm/3.84 MHz, 9.91 E+37 <p>(-120 dBm/3.84 MHz to -13 dBm/3.84 MHz actual hardware range with amplitude offset = 0)</p> <p>The actual power range is defined by adding the value of the associated amplitude offset to the range above. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84 MHz.</p> <p>Resolution: 0.01 dBm/3.84 MHz</p>
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714; "CALL:STATUS:AWGNOISE:POWER:AMPLITUDE?" !Queries the current AWGN power.</pre>	

CALL:STATUS:AWGNoise:POWER:STATE?

Function	Queries the current on/off state of the additive white Gaussian noise (AWGN) source. AWGN power level on/off state is set using the " CALL:AWGNoise:POWER " commands.
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714; "CALL:STATUS:AWGNOISE:POWER:STATE?"</pre>	

CALL:STATUS

CALL:STATUS:CCPChannel:PRIMary[:LEVel]?

Function	Queries the current level of the primary common control physical channel.
Query	Range: -20.00 to 0 dB, 9.91 E+37 Resolution: 0.01 dB
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:STATUS:CCPCHANNEL:PRIMARY:LEVEL?"	

CALL:STATUS:CCPChannel:PRIMary:STATe?

Function	Queries the current state of the primary common control physical channel.
Query	Range: 0 1
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:STATUS:CCPCHANNEL:PRIMARY:STATE?"	

CALL:STATUS:CELL:POWer[:AMPLitude]?

Function	Queries the current cell power level. Cell power is set using the "CALL[:CELL]:POWer" commands.
Query	Range: <ul style="list-style-type: none">-170dBm/3.84 MHz to +37dBm/3.84 MHz, 9.91 E+37 (-120 dBm/3.84 MHz to -13 dBm/3.84 MHz actual hardware range with amplitude offset = 0) The actual power range is defined by adding the value of the associated amplitude offset to the range above. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84 MHz. Resolution: 0.01 dBm/3.84 MHz
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:STATUS:CELL:POWER:AMPLITUDE?"	

CALL:STATUS:CELL:POWER:STATE?

Function	Queries the current state of the cell power setting. Cell power state is set using the "CALL[:CELL]:POWER" commands.
Query	Range: 1 0
*RST Setting	0 (Off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:CELL:POWER:STATE?"	

CALL:STATUS:CELL:SYSTEM[:TYPE]?

Function	Queries the current system type that the test set is currently emulating. When the test set is in active cell operating mode (see "CALL[:CELL]:OPERating") the current system type is selected by the "CALL[:CELL]:SYSTEM" command. (Active cell operating mode is not available in the initial W-CDMA test application release.) When the test set is in any test mode operating mode (see "CALL[:CELL]:OPERating") or CW operating mode, this command will return the corresponding system type.
Query	Range: FDD CW
*RST Setting	FDD
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:CELL:SYSTEM:TYPE?"	

CALL:STATUS:CPICHannel[:LEVEL]?

Function	Queries the current common pilot channel's power.
Query	Range: -20.00 to 0 dB, 9.91 E+37 Resolution: 0.01 dB
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:CPICHANNEL:LEVEL?"	

CALL:STATUS

CALL:STATUS:CPICHannel:STATE?

Function	Queries the current state of the common pilot channel.
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714 ; "CALL : STATUS : CPICHANNEL : STATE? "	

CALL:STATUS:DPCHannel[:LEVEL]?

Function	Queries the current dedicated physical channel's power.
Query	Range: -20.00 to 0 dB, 9.91 E+37 Resolution: 0.01 dB
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714 ; "CALL : STATUS : DPCHANNEL : LEVEL? "	

CALL:STATUS:DPCHannel:STATE?

Function	Queries the current state of the dedicated physical channel.
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714 ; "CALL : STATUS : DPCHANNEL : STATE? "	

CALL:STATUS:OCNSource[:LEVel]?

Function	Queries the orthogonal channel noise source (OCNS) level for the selected system type. The OCNS level is set using the "CALL:OCNSource" commands. The optional [:SElected] keyword in this command specifies that the OCNS channel level being queried applies to the current system type.
Query	Range: 0 to -20 dB, 9.91 E+37 Resolution: 0.01 dB
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:OCNSOURCE:LEVEL?"	

CALL:STATUS:OCNSource:STATe?

Function	Queries the current on/off state of the orthogonal channel noise simulator channel (OCNS). The OCNS channel on/off state is set using the "CALL:OCNSource" commands. The optional [:SElected] keyword in this command specifies that the OCNS channel state being queried applies to the current system type.
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:OCNS:STATE?"	

CALL:STATUS:PIChannel[:LEVel]?

Function	Queries the current downlink page indicator channel's power.
Query	Range: -20.00 to 0 dB, 9.91 E+37 Resolution: 0.01 dB
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:PICHANNEL:LEVEL?"	

CALL:STATUS

CALL:STATUS:PIChannel:STATE?

Function	Queries the current state of the downlink page indicator channel.
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:PICHANNEL:STATE?"	

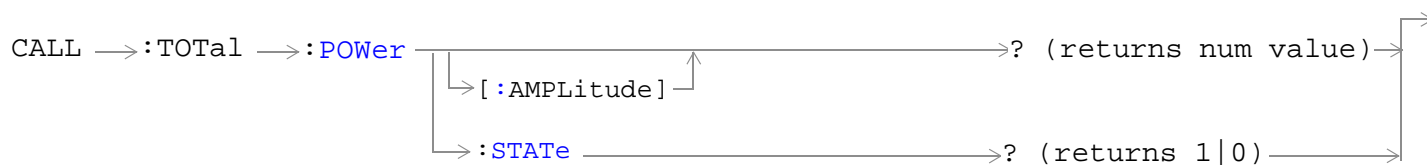
CALL:STATUS:TOTAL:POWER[:AMPLITUDE]?

Function	Queries the total RF power of the currently selected system type. The total RF power is equal to the sum of the cell power setting (see "CALL[:CELL]:POWER") and the AWGN setting (see "CALL:AWGNNoise:POWER").
Query	Range: <ul style="list-style-type: none">-170dBm/3.84 MHz to +37dBm/3.84 MHz, 9.91 E+37 (-120 dBm/3.84 MHz to -13 dBm/3.84 MHz actual hardware range with amplitude offset = 0) The actual power range is defined by adding the value of the associated amplitude offset to the range above. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84 MHz. Resolution: 0.01 dBm/3.84 MHz
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:TOTAL:POWER:AMPLITUDE?"	

CALL:STATUS:TOTAL:POWER:STATE?

Function	Queries the current total RF power measurement's state for the currently selected system type. This query will return a 1 (on) if the current cell power ("CALL[:CELL]:POWER") power state is on.
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "CALL:STATUS:TOTAL:POWER:STATE?"	

CALL:TOTal:POWer



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CALL:TOTal:POWer[:AMPLitude]?

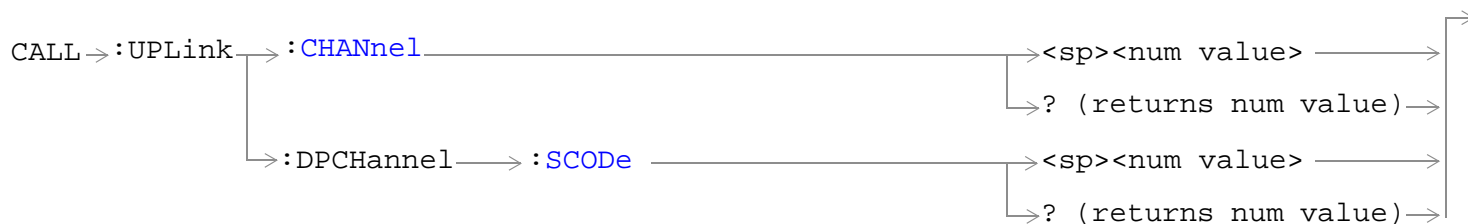
Function	Queries the total RF power settings for the current system type. Total RF Power is the sum of cell power and AWGN power
Query	Range: <ul style="list-style-type: none"> -170 dBm/3.84 MHz to +37dBm/3.84 MHz, 9.91 E+37 (-120 dBm/3.84 MHz to -13 dBm/3.84 MHz actual hardware range with amplitude offset = 0) The actual power range is defined by adding the value of the associated amplitude offset to the range above. For example, if amplitude offset is -3.5 dB, then the power range will be -123.5 dBm/3.84 MHz to -16.5 dBm/3.84 MHz. Resolution: 0.01 dBm/3.84 MHz
*RST Setting	9.91 E+37
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "CALL:TOTAL:POWER:AMPLITUDE?"	

CALL:TOTal:POWer

CALL:TOTal:POWer:STATe?

Function	<p>Queries the total RF power state for the current system type.</p> <p>The total RF power state is 1 (on) if either cell power or AWGN power is on.</p> <p>The return value for this query is not necessarily the total power state at the moment this command is processed by the test set. This command may return a state that has been requested of the test set, but that has been pended or delayed for some reason. To query the power state of the test set at the moment, use the "CALL:STATus:TOTal:POWer:STATe?" command.</p>
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714 ; "CALL:TOTAL:POWER:STATE?"	

CALL:UPLink



[“Diagram Conventions” on page 168](#)

CALL:UPLink:CHANnel

Function	Sets/queries the uplink channel number (FDD UL UARFCN).
Setting	Range: <ul style="list-style-type: none"> • 4095 - 4270 • 4375 - 4600 • 8525 - 8950 • 9225 - 9925
Query	Range: <ul style="list-style-type: none"> • 4095 - 4270 • 4375 - 4600 • 8525 - 8950 • 9225 - 9925
*RST Setting	9300
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:UPLINK:CHANNEL?" !Queries the FDD UL UARFCN.	

CALL:UPLink

CALL:UPLink:DPCHannel:SCODE

Function	Sets/queries the uplink dedicated physical channel's scrambling code. This setting cannot be changed while the active cell operating mode. Attempting to change this setting while in this mode will result in the following error message: "Command Rejected While in Active Cell Mode."
Setting	Range: 0 to 38399
Query	Range: 0 to 38399
*RST Setting	1
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"CALL:CELL:SCODE 10" !Sets the uplink DPCH scrambling code to 10.	

DISPlay Subsystem

Description

The DISPlay subsystem is used to configure the test set's display mode or display brightness . Use of the DISPlay subsystem is not required to set or query any data or results.

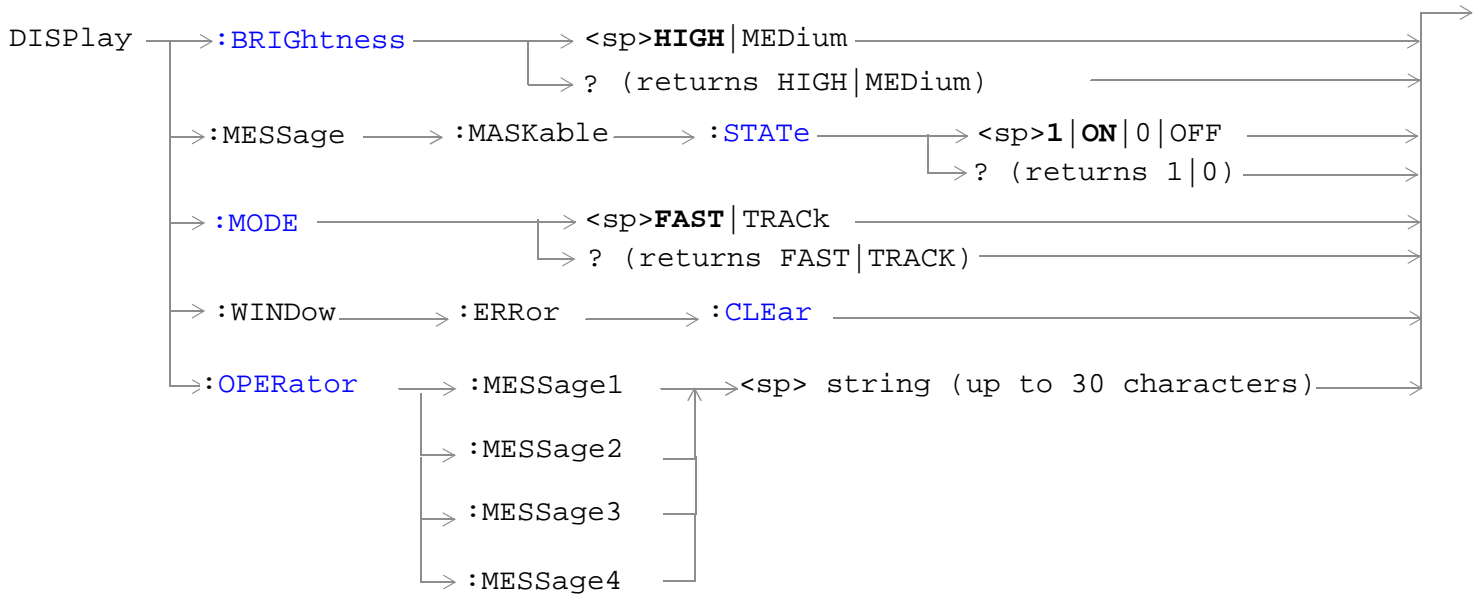
Display Backlight Dimming

The test set's display brightness parameter has two settings at this time, high and medium. The life of the display's backlight will be maximized when brightness is set to medium. The test set has an auto dimming feature that will lower the display brightness automatically if approximately 10 minutes pass without a key being pressed on the test set's front panel. The display will return to the brightness level shown in the Display Brightness field when the test set is set to local and any front panel key is pressed. There is no other user control for this feature.

Syntax Diagram and Command Descriptions

“DISPlay”

DISPlay



[“Diagram Conventions” on page 168](#)

DISPlay:BRIGhtness

Function	Sets/queries the test set's display brightness. A display backlight dimming feature lowers the display brightness after approximately 10 minutes without any manual user interaction with the test set. See "Display Backlight Dimming" on page 219.
Setting	Range: MEDium HIGH
Query	Range: MED HIGH
Factory setting	HIGH (this parameter is not affected by any reset operation and can only be changed by direct user access)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"DISPLAY:BRIGHTNESS MEDIUM" !Sets display brightness to medium.</pre>	

DISPlay:MESSAge:MASKable:STATe

Function	Blocks maskable messages from appearing on the test set display screen but not from the Message Log. Maskable messages are reported to the Message Log in either state. See "Error Messages" on page 456.
Setting	Range: On Off
Query	Range: On Off
Factory setting	On
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"DISPLAY:MESSAGE:MASKABLE:STATE OFF" !Prevents certain messages from appearing on the display.</pre>	

DISPlay:MODE

Function	Sets/queries the test set's display mode. See "Display Mode (Track/Fast)" for a description of fast and track display modes.
Setting	Range: FAST TRACK
Query	Range: FAST TRAC
*RST setting	TRACK
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"DISPLAY:MODE FAST" !Sets display mode to fast.</pre>	

DISPlay

DISPlay:WINDow:ERRor:CLEar

Function	Clears the error message from the display screen but not from the Message Log.
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"DISPLAY:WINDOW:ERROR:CLEAR" !Clears an error message from the display.	

DISPlay:OPERator:MESSage

Function	Allows the operator to enter up to four messages, each up to 30 characters in length. These messages will be printed to the display when the command is sent and "DISPlay:MODE" is set to FAST.
Setting	1 2 3 4 1=uppermost field, 4=lowermost field
Factory setting	Each message is initialized to a null string. Nothing will be displayed until one or more of the four GPIB messages is sent to the test set.
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"DISP:OPER:MESS1`Press F6 to stop test`" !Writes the message "Press F6 to stop test" to the uppermost display field.	

FETCh? Subsystem

Description

The FETCh? query is a function that allows users to query results from a measurement that was previously INITiated or READ. It does NOT begin a measurement. If no measurement is in progress it will return the integrity and measurement values from the last measurement made, or return an integrity of No Result Available and results of NAN. If a measurement is in process, the query will hang until the results are available, or the measurement fails or times out. The exact results returned with a FETCh? will depend on the specific measurement. A measurement may have a number of different results or combination of results for a FETCh?. The FETCh? queries are intended to be used to provide overlapped operation access to measurement results from the test set. When used along with SETup and INITiate commands , FETCh? is the primary way for the user to retrieve measurement results. In order to use the test set's concurrent test capabilities the overlapped commands of INITiate and FETCh? must be used. Overlapped commands allow the user to send commands and not wait for completion.

Syntax Diagrams and Command Descriptions

[“FETCh:AFAnalyzer” on page 224](#) (AF Analyzer measurements)

[“FETCh:WACLeakage” on page 233](#) (Adjacent Channel Leakage measurements)

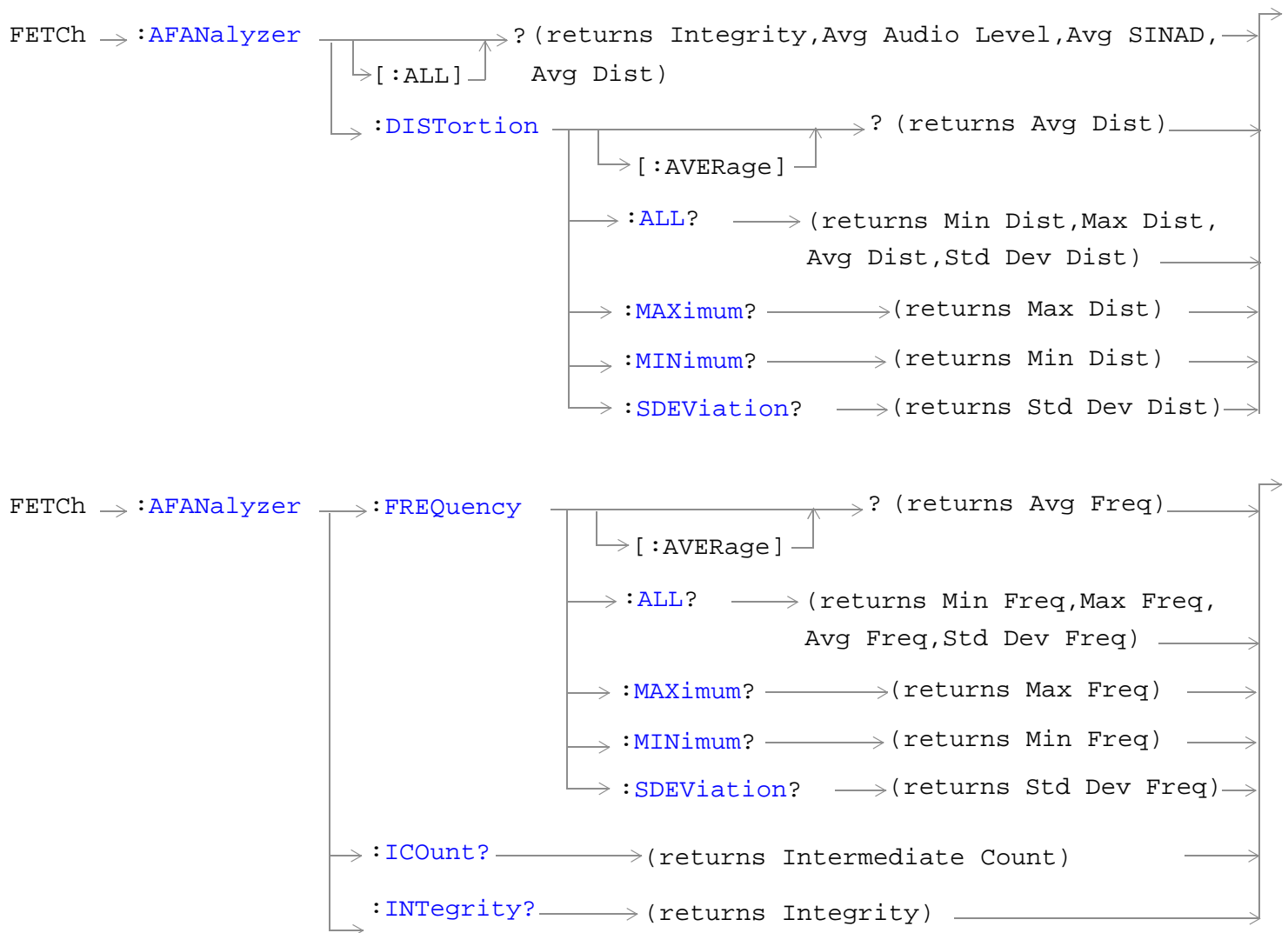
[“FETCh:WBError” on page 236](#) (Loopback Bit Error Ratio measurements)

[“FETCh:WCPower” on page 239](#) (Channel Power measurements)

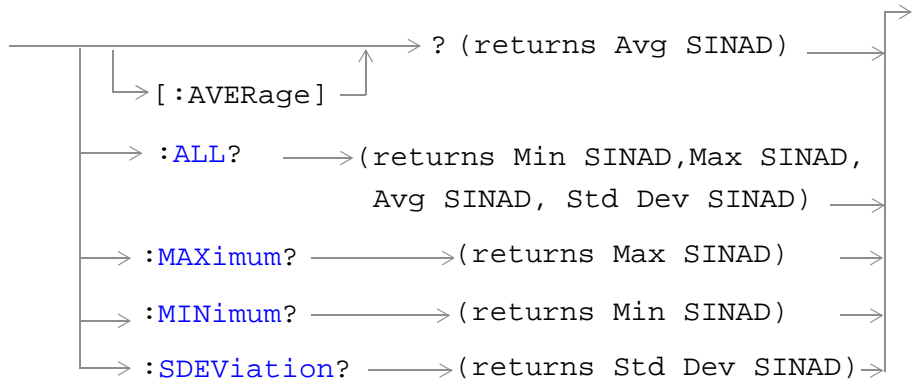
[“FETCh:WTPower” on page 243](#) (Thermal Power measurements)

[“FETCh:WWQuality” on page 247](#) (Waveform Quality measurements)

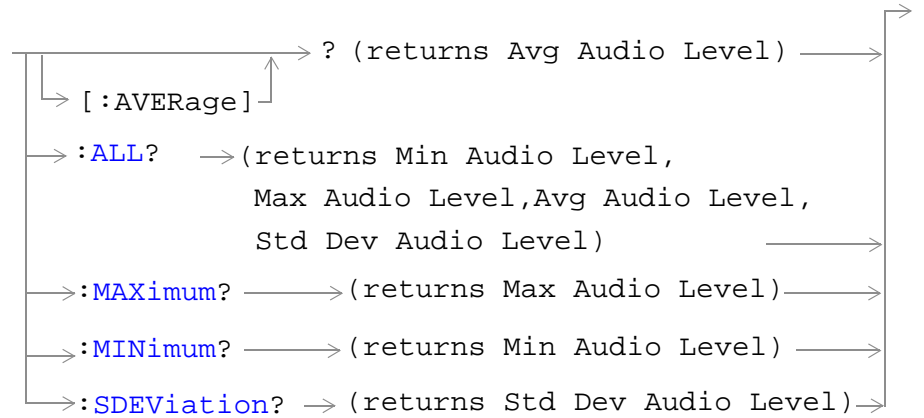
FETCh:AFANalyzer



FETCh → :AFANalyzer → :SINAD



FETCh → :AFANalyzer → :VOLTage



[“Diagram Conventions” on page 168](#)

FETCh:AFANalyzer[:ALL]?

Function	Queries the AF analyzer measurements. Measurement results are returned in the following order: integrity, average audio level, average SINAD, average distortion.
Query	<p>Average analog audio level</p> <ul style="list-style-type: none"> • Range: 0 to 20 volts, 9.91 E+37 • Resolution: The lesser of 4 significant digits or 10 uV <p>Average SINAD</p> <ul style="list-style-type: none"> • Range:-99 to 99 dB, 9.91 E+37 • Resolution: 0.01 dB <p>Average audio distortion</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.01%
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:ALL?"
!Returns integrity, average audio level, average SINAD,and average audio distortion.
```

FETCh:AFANalyzer:DIS TORTion[:AVERAge]?

Function	Queries the average audio distortion measurement.
Query	<p>Average audio distortion</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.01%
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:DIS TORTION:AVERAGE?"
```

FETCh:AFANalyzer:DISTortion:ALL?

Function	Queries the audio distortion measurements. The measurement results are returned in the following order: minimum distortion, maximum distortion, average distortion, standard deviation distortion.
Query	Minimum, maximum, and average audio distortion: <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.01% Standard deviation audio distortion: <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.001%
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:DIS TORTION:ALL?"
!Returns minimum, maximum, average, and standard deviation audio distortion.
```

FETCh:AFANalyzer:DIS Tortion:MAXimum?

Function	Queries the maximum audio distortion.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.01%
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:DIS TORTION:MAXIMUM?"
```

FETCh:AFANalyzer:DIS Tortion:MINimum?

Function	Queries the minimum audio distortion.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.01%
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:DIS TORTION:MINIMUM?"
```

FETCh:AFANalyzer:DISTortion:SDEViation?

Function	Queries the standard deviation audio distortion.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.001%
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:DIS TORTION:SDEV IATION?"
```

FETCh:AFANalyzer:FREQuency[:AVERage]?

Function	Queries the average audio frequency measurement.
Query	Average audio frequency <ul style="list-style-type: none"> • Range: 0 to 99999 Hz, 9.91 E+37 • Resolution: 0.1 Hz
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:FREQUEN CY:AVER AGE?"
```

FETCh:AFANalyzer:FREQuency:ALL?

Function	Queries the audio frequency measurements. The measurement results are returned in the following order: minimum frequency, maximum frequency, average frequency, standard deviation frequency.
Query	Minimum, maximum, and average audio frequency: <ul style="list-style-type: none"> • Range: 0 to 99999 Hz, 9.91 E+37 • Resolution: 0.1 Hz Standard deviation audio frequency: <ul style="list-style-type: none"> • Range: 0 to 99999 Hz, 9.91 E+37 • Resolution: 0.01 Hz
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:FREQUEN CY:ALL?"
!Returns mininum, maximum, average, and standard deviation audio frequency.
```

FETCh:AFANalyzer:FREQuency:MAXimum?

Function	Queries the maximum audio frequency.
Query	Range: 0 to 99999 Hz, 9.91 E+37 Resolution: 0.1 Hz
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:FREQUENcy:MAXIMUM?"
```

FETCh:AFANalyzer:FREQuency:MINimum?

Function	Queries the minimum audio frequency.
Query	Range: 0 to 99999 Hz, 9.91 E+37 Resolution: 0.1 Hz
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:FREQUENcy:MINIMUM?"
```

FETCh:AFANalyzer:FREQuency:SDEViation?

Function	Queries the standard deviation audio frequency.
Query	Range: 0 to 99999 Hz, 9.91 E+37 Resolution: 0.01 Hz
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:FREQUENcy:SDEVIAtion?"
```

FETCh:AFANalyzer:ICount?

Function	Queries the intermediate count of measurements completed in a multi-measurement.
Query	Range: 0 to 999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:ICOUNT?"
```

FETCh:AFANalyzer:INTegrity?

Function	Queries the measurement integrity indicator for the last AF analyzer measurement completed. Zero indicates a normal measurement. See “Integrity Indicator” on page 153 for information about non-zero integrity results.
Query	Range: 1 through 16
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANalyzer:INTegrity?"
!Query the integrity indicator for the AF analyzer results.
```

FETCh:AFANalyzer:SINAD[:AVERage]?

Function	Queries the average SINAD measurement.
Query	Average SINAD <ul style="list-style-type: none"> • Range: -99 to 99 dB, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:SINAD:AVERAGE?"
```

FETCh:AFANalyzer:SINAD:ALL?

Function	Queries the SINAD measurements. Measurement results are returned in the following order: minimum SINAD, maximum SINAD, average SINAD, and standard deviation SINAD.
Query	Minimum, maximum, average SINAD: <ul style="list-style-type: none"> • Range: -99 to 99 dB, 9.91 E+37 • Resolution: 0.01 dB Standard deviation SINAD <ul style="list-style-type: none"> • Range: -99 to 99 dB, 9.91 E+37 • Resolution: 0.001 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:SINAD:ALL?"
!Returns minimum, maximum, average, and standard deviation SINAD.
```

FETCh:AFANalyzer:SINAD:MAXimum?

Function	Queries the maximum SINAD measurements.
Query	Range: -99 to 99 dB, 9.91 E+37 Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:AFANALYZER:SINAD:MAXIMUM?"
```

FETCh:AFANalyzer:SINAD:MINimum?

Function	Queries the minimum SINAD measurements.
Query	Range: -99 to 99 dB, 9.91 E+37 Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:AFANALYZER:SINAD:MINIMUM?"
```

FETCh:AFANalyzer:SINAD:SDEVIation?

Function	Queries the standard deviation SINAD measurements.
Query	Range: 0 to 99 dB, 9.91 E+37 Resolution: 0.001 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:AFANALYZER:SINAD:SDEVIATION?"
```

FETCh:AFANalyzer:VOLTage[:AVERage]?

Function	Queries the average audio level measurement.
Query	Range: 0 to 20 volts, 9.91 E+37 Resolution: the lesser of 4 significant digits or 10 uV
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:AFANALYZER:VOLTAGE:AVERAGE?"
```

FETCh:AFANalyzer:VOLTage:ALL?

Function	Queries the audio level measurements. Measurement results are returned in the following order: minimum audio level, maximum audio level, average audio level, standard deviation audio level.
Query	Range: 0 to 20 V, 9.91 E+37 Resolution: 4 significant digits
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:VOLTAGE:ALL?"
!Returns minimum, maximum, average, and standard deviation audio level.
```

FETCh:AFANalyzer:VOLTage:MAXimum?

Function	Queries the maximum audio level measurement.
Query	Range: 0 to 20 V, 9.91 E+37 Resolution: 4 significant digits
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:VOLTAGE:MAXIMUM?"
```

FETCh:AFANalyzer:VOLTage:MINimum?

Function	Queries the minimum audio level measurement.
Query	Range: 0 to 20 V, 9.91 E+37 Resolution: 4 significant digits
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:VOLTAGE:MINIMUM?"
```

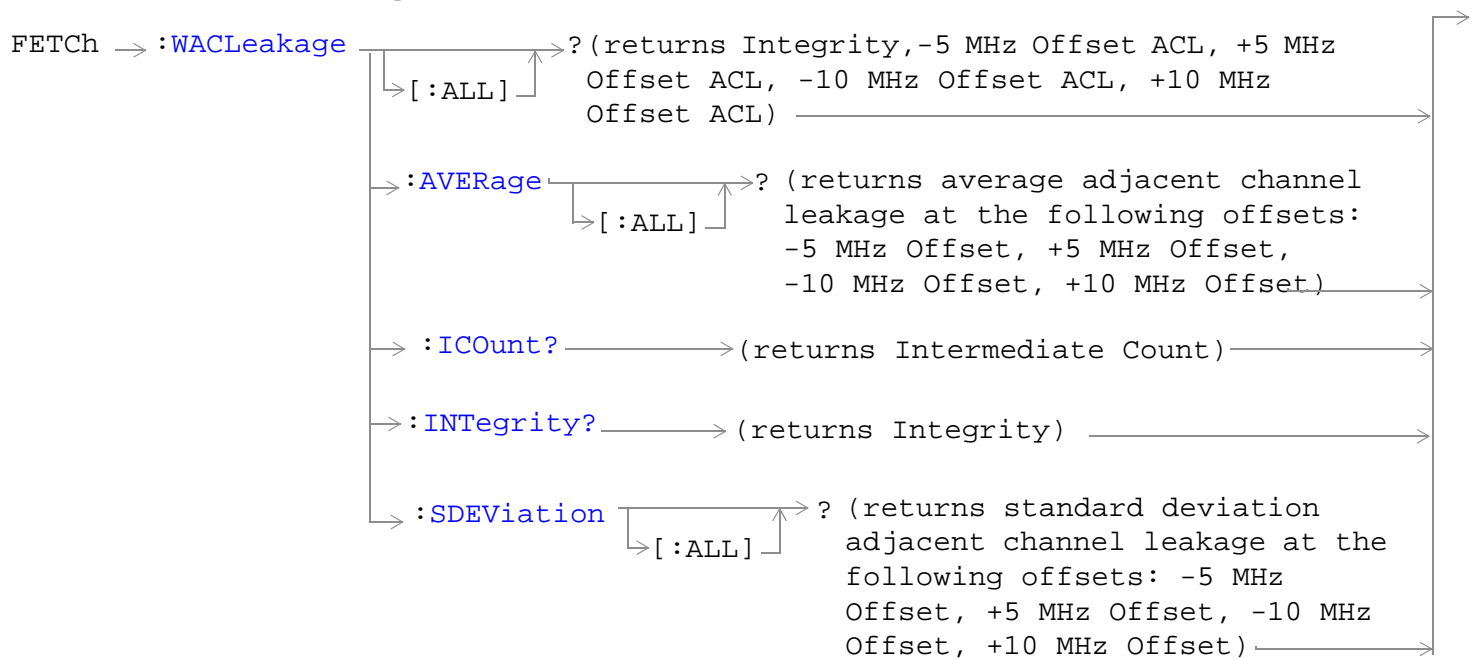
FETCh:AFANalyzer:VOLTage:SDEVIation?

Function	Queries the standard deviation audio level measurement.
Query	Range: 0 to 20 V, 9.91 E+37 Resolution: 4 significant digits
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:AFANALYZER:VOLTAGE:SDEVIATION?"
```


FETCh:WACLeakage



[“Diagram Conventions” on page 168](#)

FETCh:WACLeakage[:ALL]?

Function	<p>Queries a adjacent channel leakage ratio (ACLR) measurement result.</p> <p>This query returns an integrity indicator followed by -5 MHz offset power ratio maximum, +5 MHz offset power ratio maximum, -10 MHz offset power ratio maximum, +10 MHz offset power ratio maximum.</p> <p>If the multi-measurement state is on, the result represents the <i>average</i> of a number of adjacent channel leakage measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see “SETup:WACLeakage:COUNT[:SNUMBER]” .</p>
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dBm
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WACLeAKAGE:ALL?" !Returns integrity, ACLR measurements.

FETCh:WACLeakage:AVERage[:ALL]?

Function	<p>Queries the average adjacent channel leakage ratio at the following offsets: -5 MHz, +5 MHz, -10 MHz, +10 MHz.</p> <p>To set the number of measurement to average, use the command “SETup:WACLeakage:COUNT[:SNUMBER]” on page 295.</p>
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WACLeAKAGE:AVERAGE:ALL?"
!Queries the average adjacent channel leakage ratio.

FETCh:WACLeakage:ICount?

Function	<p>Queries the intermediate count of measurements completed in a multi-measurement.</p> <p>To set up multi-measurements, see “SETup:WACLeakage:COUNT[:SNUMBER]” .</p>
Query	Range: 0 to 999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WACLeAKAGE:ICOUNT?"
!Returns the intermediate count of adjacent channel leakage ratio multi-measurements.

FETCh:WACLeakage:INTEgrity?

Function	Queries the measurement integrity indicator for the last adjacent channel leakage measurement completed. Zero indicates a normal measurement. See “Integrity Indicator” on page 153 for information about non-zero integrity results.
Query	Range: 0 through 23
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WACLeakage:INTEgrity?"
!Queries the integrity indicator for the adjacent channel leakage ratio results.
```

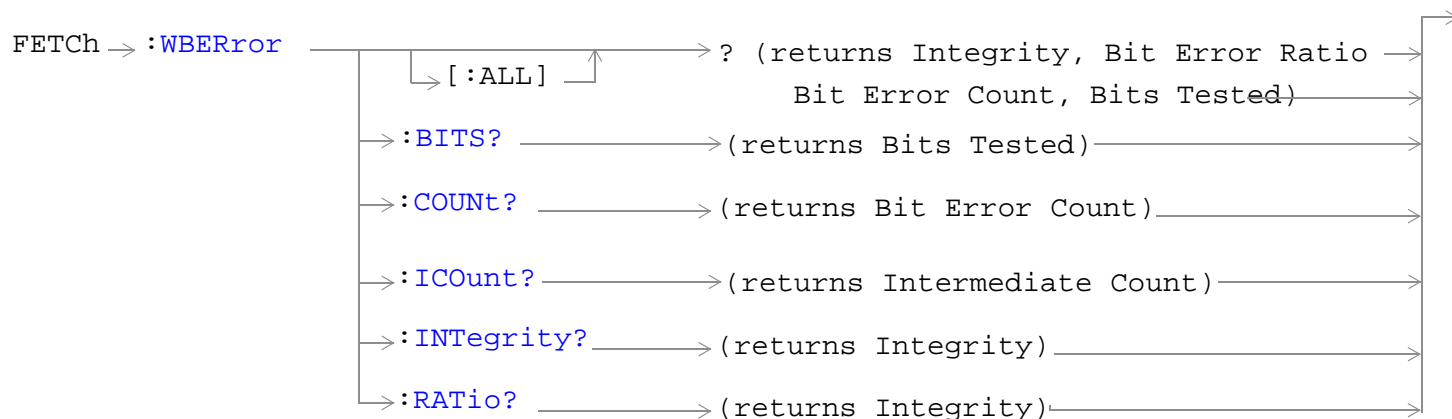
FETCh:WACLeakage:SDEVIation[:ALL]?

Function	Queries the standard deviation of several adjacent channel leakage ratio measurements at the following offsets: -5 MHz, +5 MHz, -10 MHz, +10 MHz. To set the number of measurement to compare, use the command “SETup:WACLeakage:COUnT[:SNUMber]” .
Query	<ul style="list-style-type: none"> • Range: 0 to 99 dB, 9.91 E+37 • Resolution: 0.001 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WACLeakage:SDEVIATION:ALL?"
!Queries the standard deviation of power for the adjacent channel leakage ratio
!measurements.
```

FETCh:WBError



“Diagram Conventions” on page 168

FETCh:WBError[:ALL]?

Function	Queries a loopback bit error measurement result. Measurement results are returned in the following order: integrity, bit error ratio, bit error count, bits tested.
Query	<p>Range</p> <ul style="list-style-type: none"> • Integrity: 1 to 23 • Bit Error Ratio: 0 to 99%, 9.91 E+37 • Bit Error Count: 0 to 999999, 9.91 E+37 • Bits Tested: 0 to 999999, 9.91 E+37 <p>Resolution</p> <ul style="list-style-type: none"> • Integrity: 1 • Bit Error Ratio: 0.0001 dB • Bit Error Count: 1 • Bits Tested: 1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:WBError:ALL?"
```

FETCh:WBERror:BITS?

Function	Queries the number of bits tested.
Query	Range: 0 to 999999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:WBERROR:BITS?"
```

FETCh:WBERror:COUNT?

Function	Queries the bit error count.
Query	Range: 0 to 999999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:WBERROR:COUNT?"
```

FETCh:WBERror:ICount?

Function	Queries the intermediate count of bits tested. To set up the total number of bits to test, see "SETup:WBERror:COUNT" .
Query	Range: 0 to 999999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:WBERROR:ICOUNT?"
```

FETCh:WBERror:INTegrity?

Function	Queries the measurement integrity indicator for the last loopback bit error measurement completed. Zero indicates a normal measurement. See "Integrity Indicator" on page 153 for information about non-zero integrity results.
Query	Range: 0 through 23
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:WBERROR:INTegrity?"
```

FETCh:WBERror

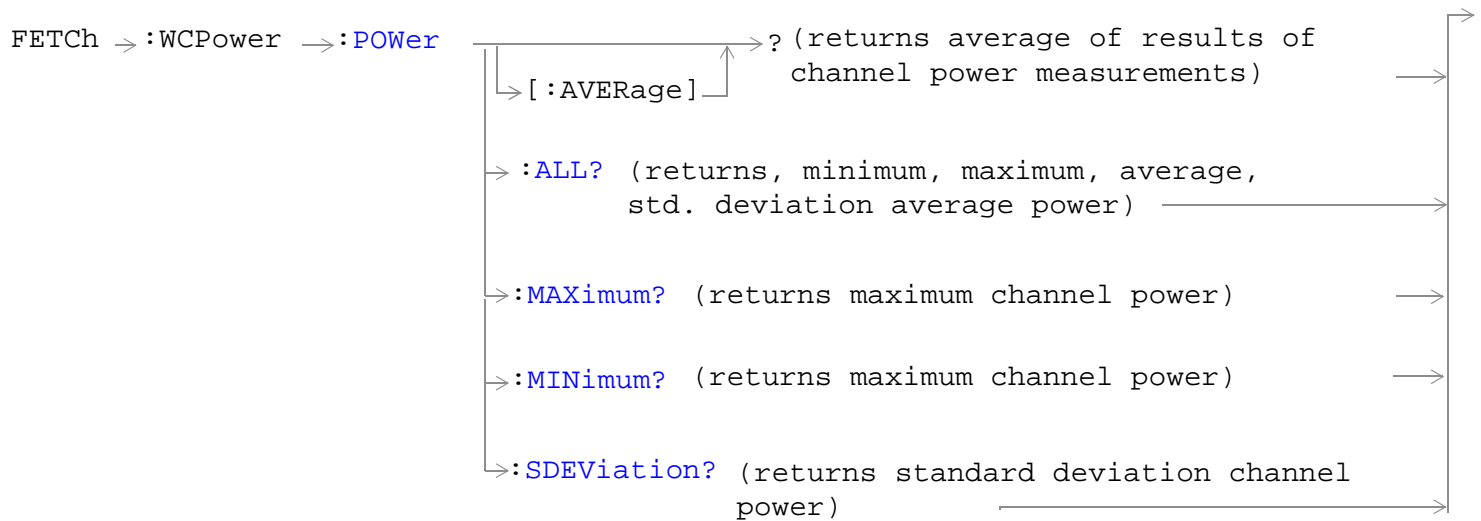
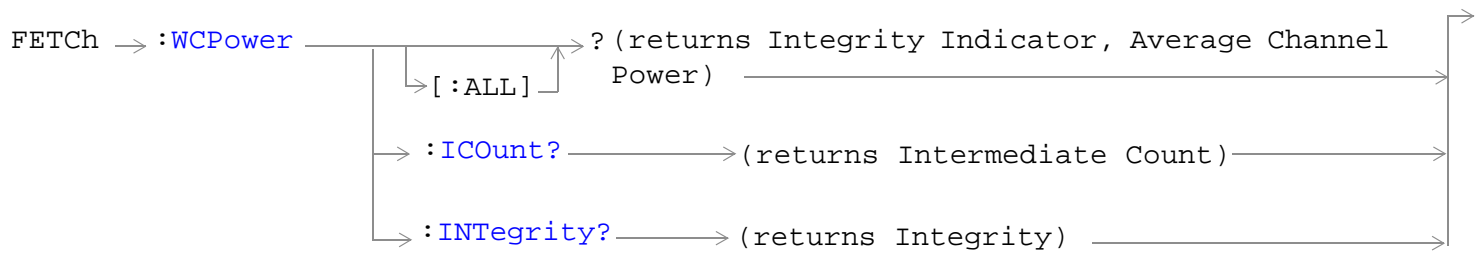
FETCh:WBERror:RATio?

Function	Queries the loopback bit error ratio measurement.
Query	Range: 0 to 99%, 9.91 E+37
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCh:WBERror:RATio?"
```

FETCh:WCPower



[“Diagram Conventions” on page 168](#)

FETCh:WCPower[:ALL]?

Function	<p>Queries a channel power measurement result.</p> <p>This query returns an integrity indicator followed by the average channel power measurement result.</p> <p>If the multi-measurement state is on, the result represents the <i>average</i> of a number of channel power measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see “SETup:WCPower:COUNT[:SNUMBER]” .</p>
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dBm
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:ALL?" !Returns integrity, channel power measurement.
```

FETCh:WCPower:ICount?

Function	<p>Queries the intermediate count of measurements completed in a multi-measurement.</p> <p>To set up multi-measurements, see “SETup:WCPower:COUNT[:SNUMBER]” .</p>
Query	Range: 0 to 999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:ICOUNT?"
!Returns the intermediate count of channel power multi-measurements.
```

FETCh:WCPower:INTEgrity?

Function	<p>Queries the measurement integrity indicator for the last channel power measurement completed.</p> <p>Zero indicates a normal measurement. See “Integrity Indicator” on page 153 for information about non-zero integrity results.</p>
Query	Range: 0 through 23
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:INTEgrity?"
!Queries the integrity indicator for the channel channel power results.
```


FETCh:WCPower:POWer[:AVERAge]?

Function	Queries the average of the results of several channel power measurements. To set the number of measurement to average, use the command “SETup:WCPower:COUNT[:SNUMBER]” on page 304.
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:POWer:AVERAge?"
!Queries the average power for the channel power results.
```

FETCh:WCPower:POWer:ALL?

Function	<p>Queries the statistical measurement results for several channel power measurements.</p> <p>To set the number of measurements to gather statistics for, use the command “SETup:WCPower:COUNT[:SNUMBER]” on page 304.</p> <p>Results are returned in the following order: minimum, maximum, average, and standard deviation channel power.</p>
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:POWer:ALL?"
!Queries the statistical measurement results for channel power measurement.
```

FETCh:WCPower:POWer:MAXimum?

Function	Queries the maximum power of several channel power measurements. To set the number of measurement to average, use the command “SETup:WCPower:COUNT[:SNUMBER]” on page 304..
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:POWer:MAXimum?"
!Queries the integrity indicator for the channel power results.
```

FETCh:WCPower:POWER:MINimum?

Function	Queries the minimum power of several channel power measurements. To set the number of measurement to compare, use the command " SETup:WCPower:COUNT[:SNUMBER] " on page 304.
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:POWER:MINimum?"
!Queries the minimum channel power.
```

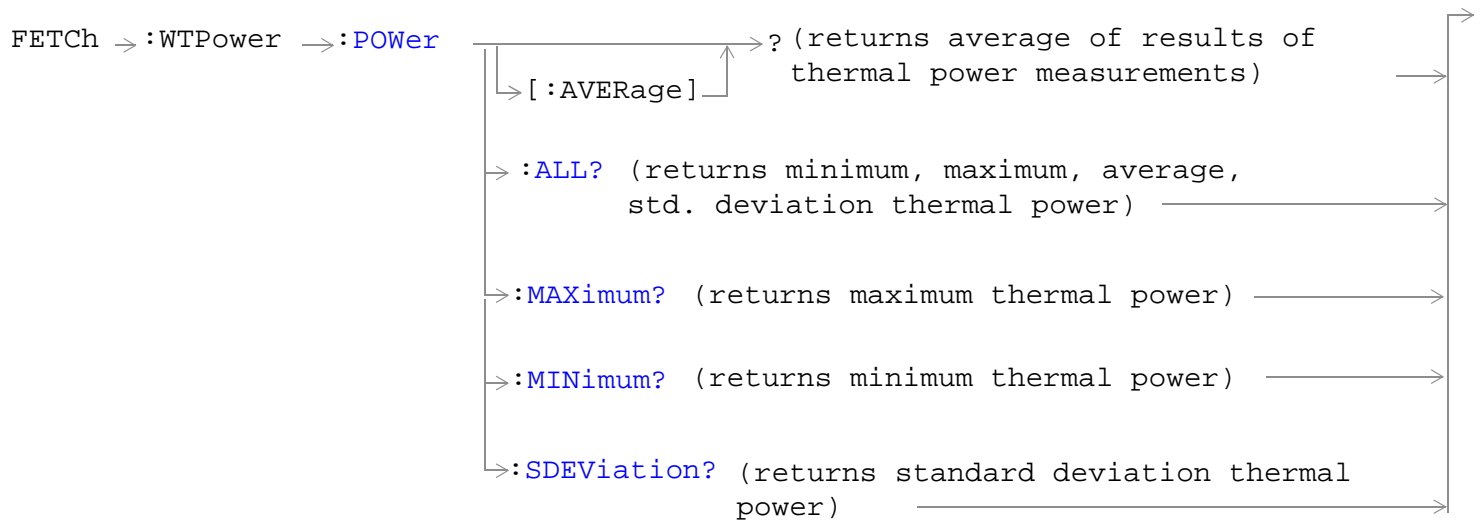
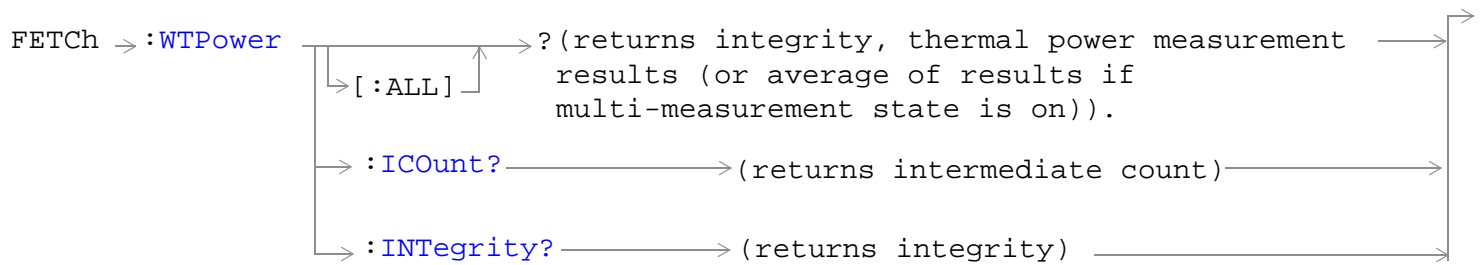
FETCh:WCPower:POWER:SDEVIation?

Function	Queries the standard deviation of several channel power measurements. To set the number of measurement to compare, use the command " SETup:WCPower:COUNT[:SNUMBER] " on page 304.
Query	<ul style="list-style-type: none"> • Range: 0 to 99 dB, 9.91 E+37 • Resolution: 0.001 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WCPower:POWER:SDEVIation?"
!Queries the standard deviation of power for the channel power measurements.
```

FETCh:WTPower



“Diagram Conventions” on page 168

FETCh:WTPower[:ALL]?

Function	<p>Queries a thermal power measurement result.</p> <p>This query returns an integrity indicator followed by a thermal power measurement result (if results are available).</p> <p>If the multi-measurement state is on, the result represents the <i>average</i> of a number of thermal power measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see “SETup:WTPower:COUNT[:SNUMber]” .</p>
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:ALL?" !Returns integrity, thermal power.
```

FETCh:WTPower:ICount?

Function	<p>Queries the intermediate count of measurements completed in a multi-measurement.</p> <p>The multi-measurement state, by default, is off. To set up multi-measurements, see “SETup:WTPower:COUNT[:SNUMber]”</p>
Query	Range: 0 to 999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:ICOUNT?"
```

FETCh:WTPower:INTEgrity?

Function	<p>Queries the measurement integrity indicator for the last thermal power measurement completed.</p> <p>Zero indicates a normal measurement. See “Integrity Indicator” on page 153 for information about non-zero integrity results.</p>
Query	Range: 1 through 16
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:INTEgrity?"
!Queries the integrity indicator for the thermal power results.
```

FETCH:WTPower:POWer[:AVERAge]?

Function	Queries the average of the results of several thermal power measurements. To set the number of measurement to average, use the command “SETup:WTPower:COUNT[:SNUMber]” on page 309.
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:POWer:AVERAge?"
!Queries the thermal power for the thermal power results.
```

FETCH:WTPower:POWer:ALL?

Function	<p>Queries the statistical measurement results for several thermal power measurements.</p> <p>To set the number of measurements to gather statistics for, use the command “SETup:WTPower:COUNT[:SNUMber]” on page 309.</p> <p>Results are returned in the following order: minimum, maximum, average, and standard deviation thermal power.</p>
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:POWer:ALL?"
!Queries the statistical measurement results for thermal power measurement.
```

FETCH:WTPower:POWer:MAXimum?

Function	Queries the maximum power of several thermal power measurements. To set the number of measurement to average, use the command “SETup:WTPower:COUNT[:SNUMber]” on page 309..
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:POWer:MAXimum?"
!Queries the integrity indicator for the thermal power results.
```

FETCH:WTPower:POWER:MINimum?

Function	Queries the minimum power of several thermal power measurements. To set the number of measurement to compare, use the command " SETup:WTPower:COUNT[:SNUMBER] " on page 309.
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm, 9.91 E+37 • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCH:WTPower:POWER:MINIMUM?"
!Queries the minimum thermal power.
```

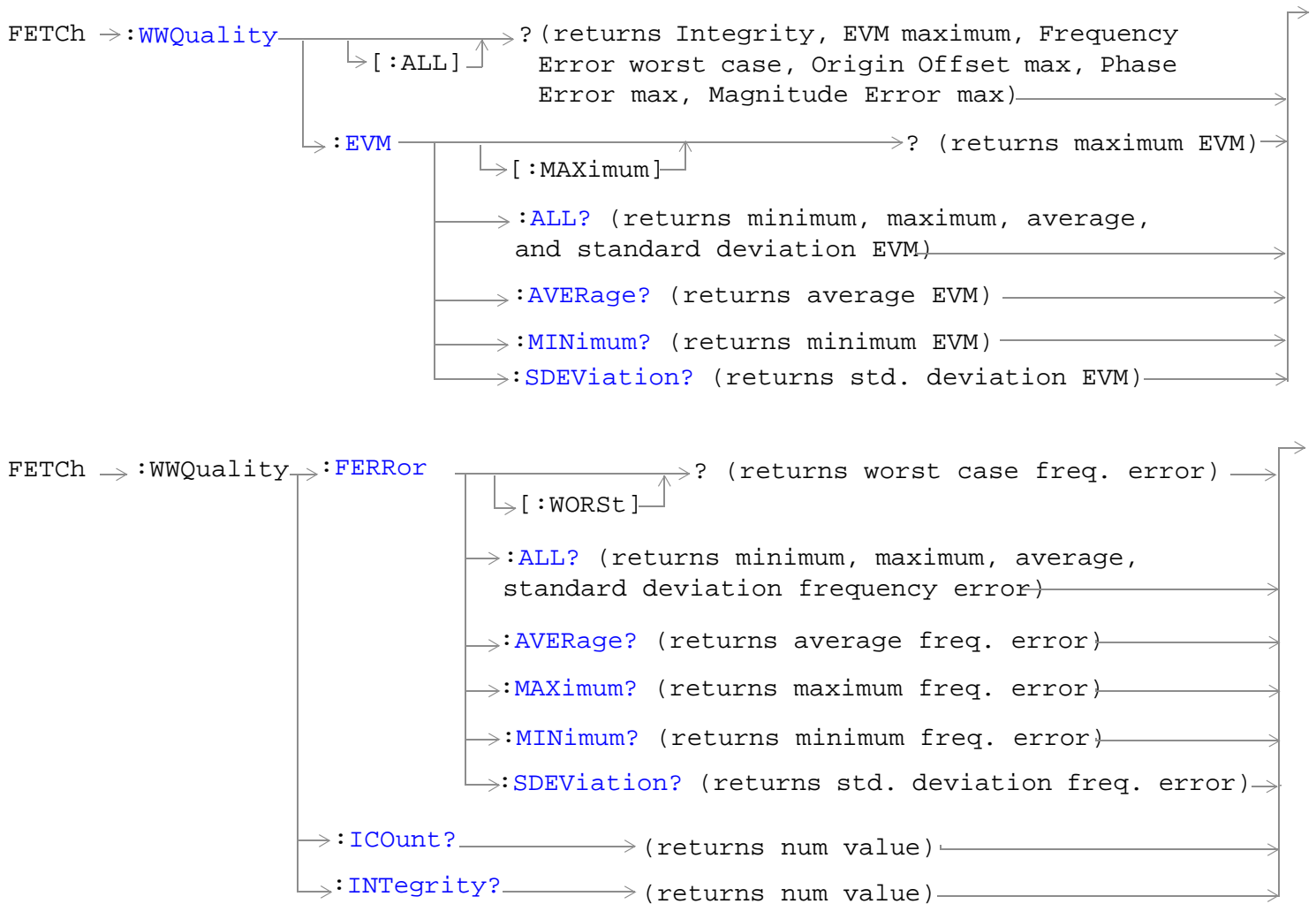
FETCH:WTPower:POWER:SDEVIation?

Function	Queries the standard deviation of several thermal power measurements. To set the number of measurement to compare, use the command " SETup:WTPower:COUNT[:SNUMBER] " on page 309.
Query	<ul style="list-style-type: none"> • Range: 0 to 99 dB, 9.91 E+37 • Resolution: 0.001 dB
Requirements	Test Application Revision: A.02.00 and above

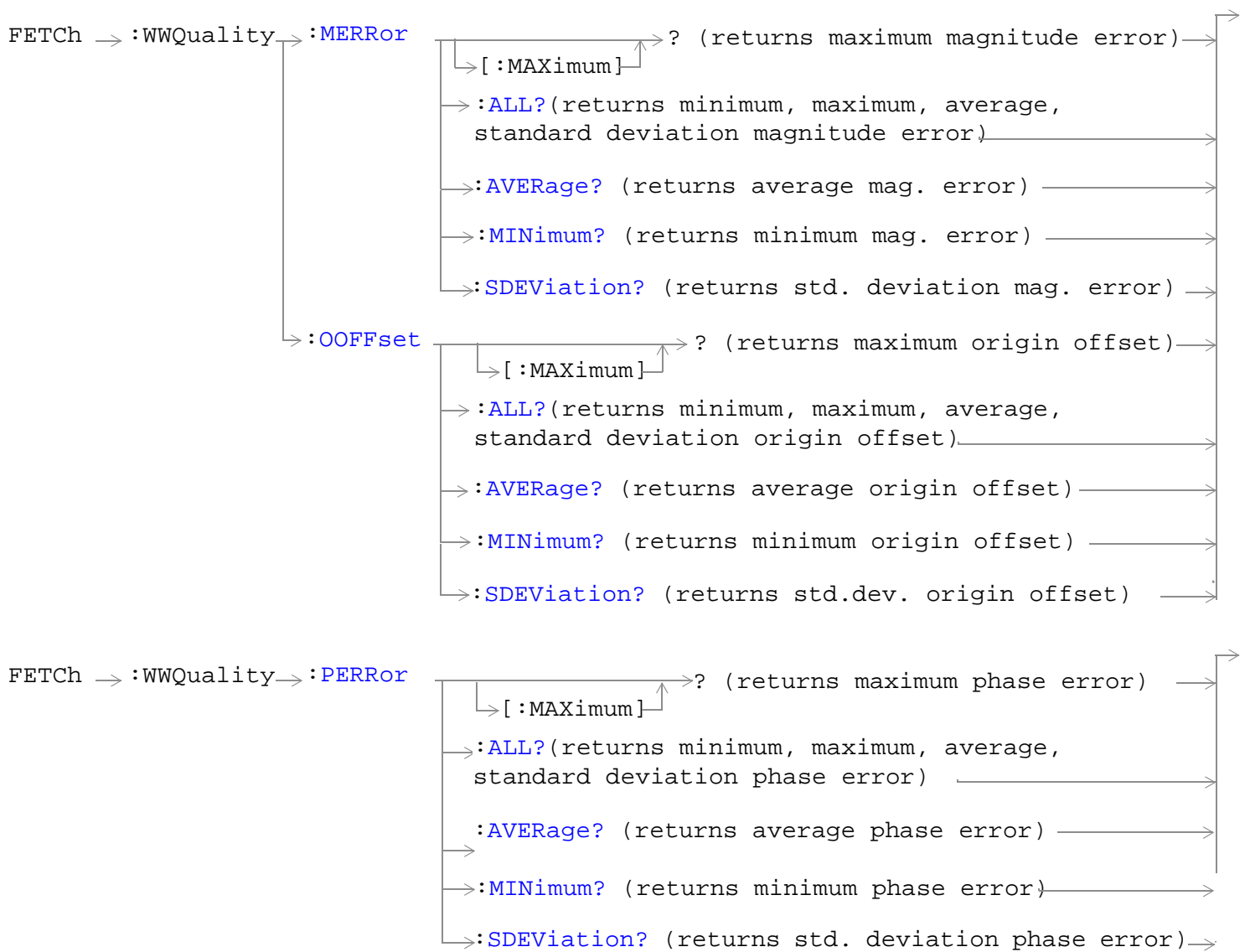
Programming Example

```
OUTPUT 714;"FETCH:WTPower:POWER:SDEVIATION?"
!Queries the standard deviation of power for the thermal power measurements.
```

FETCh:WWQuality



FETCh:WWQuality



“Diagram Conventions” on page 168

FETCh:WWQuality[:ALL]?

Function	<p>Queries the waveform quality measurements.</p> <p>Measurement results are returned in the following order: integrity, EVM maximum, frequency error worst case, origin offset maximum, phase error maximum, magnitude error maximum.</p> <p>If the multi-measurement state is on, each result represents the <i>average</i> of a number of waveform quality measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see “SETup:WWQuality:COUNt[:SNUMber]” .</p>
Query	<p>Integrity</p> <ul style="list-style-type: none"> • Range: 0 to 16 • Resolution: 1 <p>EVM Maximum</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Frequency Error worst case</p> <ul style="list-style-type: none"> • Range-99.99 to 99.99 kHz, 9.91 E+37 • Resolution: 0.1 <p>Origin Offset Maximum</p> <ul style="list-style-type: none"> • Range: -99 to 0 dB, 9.91 E+37 • Resolution: 0.1 <p>Phase Error Maximum</p> <ul style="list-style-type: none"> • Range: 0 to 180 degrees, 9.91 E+37 • Resolution: 0.1 <p>Magnitude Error Maximum</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:ALL?"
```

```
!Returns integrity, EVM maximum, frequency error worst case, origin offset maximum, phase error
!maximum, magnitude error maximum.
```

FETCh:WWQuality:EVM[:MAXimum]?

Function	Queries the maximum EVM.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714; "FETCh:WWQUALITY:EVM:MAXIMUM?" !Returns maximum EVM.

FETCh:WWQuality:EVM:ALL?

Function	Queries the EVM measurements. Results are returned in the following order: minimum, maximum, average, standard deviation error vector magnitude.
Query	<p>Minimum EVM</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Maximum EVM</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Average EVM</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Standard Deviation EVM</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714; "FETCh:WWQUALITY:EVM:ALL?" !Returns all EVM measurement results.

FETCh:WWQuality:EVM:AVERAge?

Function	Queries the average EVM.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:EVM:AVERAGE?" !Returns average EVM.
```

FETCh:WWQuality:EVM:MINimum?

Function	Queries the minimum EVM.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:EVM:MINIMUM?" !Returns mininum EVM.
```

FETCh:WWQuality:EVM:SDEVIation?

Function	Queries the standard deviation of results for EVM measurements.
Query	Range: 0 to 99%, 9.91 E+37 Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:EVM:SDEVIATION?" !Returns standard deviation EVM.
```

FETCh:WWQuality:FERRor[:WORSt]?

Function	Queries the worst case frequency error.
Query	Range: -99 to 99 kHz, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:FERROR:WORSt?" !Returns worst case frequency error.
```

FETCh:WWQuality:FERRor:ALL?

Function	Queries the frequency error measurements. Results are returned in the following order: minimum, maximum, average, standard deviation frequency error.
Query	<p>Minimum Frequency Error</p> <ul style="list-style-type: none"> • Range: -99 to 99 kHz, 9.91 E+37 • Resolution: 0.1 <p>Maximum Frequency Error</p> <ul style="list-style-type: none"> • Range: -99 to 99 kHz, 9.91 E+37 • Resolution: 0.1 <p>Average Frequency Error</p> <ul style="list-style-type: none"> • Range: -99 to 99 kHz, 9.91 E+37 • Resolution: 0.1 <p>Standard Deviation Frequency Error</p> <ul style="list-style-type: none"> • Range: -99 to 99 kHz, 9.91 E+37 • Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:FERRor:ALL?"
!Returns mininum, maximum, average, and standard deviation frequency error.
```

FETCh:WWQuality:FERRor:AVERage?

Function	Queries the average frequency error.
Query	<p>Range: -99 to 99 kHz, 9.91 E+37</p> <p>Resolution: 0.1</p>
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:FERRor:AVERAGE?" !Returns average frequency error.
```

FETCh:WWQuality:FERRor:MAXimum?

Function	Queries the average frequency error.
Query	Range: -99 to 99 kHz, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:FERRor:MAXIMUM?" !Returns maximum frequency error.
```

FETCh:WWQuality:FERRor:MINimum?

Function	Queries the minimum frequency error.
Query	Range: -99 to 99 kHz, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:FERRor:MINIMUM?" !Returns minimum frequency error.
```

FETCh:WWQuality:FERRor:SDEVIation?

Function	Queries the standard deviation of frequency error measurements.
Query	Range: 0 to 99 kHz, 9.91 E+37 Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:FERRor:SDEVIation?" !Returns standard deviation frequency error.
```

FETCh:WWQuality

FETCh:WWQuality:ICount?

Function	Queries the intermediate count of measurements completed in a multi-measurement.
Query	Range: 0 to 999
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCH:WWQUALITY:ICOUNT?"
```

FETCh:WWQuality:INTEGRity?

Function	Queries the measurement integrity indicator for the last waveform quality measurement completed. Zero indicates a normal measurement. See "Integrity Indicator" on page 153 for information about non-zero integrity results.
Query	Range: 0 through 23
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCH:WWQUALITY:INTEGRITY?"  
!Queries the integrity indicator for the channel channel power results.
```

FETCh:WWQuality:MERRor[:MAXimum]?

Function	Queries the average magnitude error.
Query	Range: 0 to 99% Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714; "FETCH:WWQUALITY:MERRor:MAXIMUM?" !Returns maximum magnitude error.
```

FETCh:WWQuality:MERRor:ALL?

Function	Queries the magnitude error measurements. Results are returned in the following order: minimum, maximum, average, standard deviation magnitude error.
Query	<p>Minimum Magnitude Error</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Maximum Magnitude Error</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Average Magnitude Error</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Standard Deviation Magnitude Error</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:MERRor:ALL?"
!Returns mininum, maximum, average, and standard deviation magnitude error.
```

FETCh:WWQuality:MERRor:AVERAge?

Function	Queries the average magnitude error.
Query	<p>Range: 0 to 99%</p> <p>Resolution: 0.1</p>
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:MERRor:AVERAGE?" !Returns average magnitude error.
```

FETCh:WWQuality:MERRor:MINimum?

Function	Queries the minimum magnitude error.
Query	Range: 0 to 99% Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:MERRor:MINIMUM?" !Returns minimum magnitude error.

FETCh:WWQuality:MERRor:SDEVIation?

Function	Queries the standard deviation of magnitude error measurements.
Query	Range: 0 to 99% Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:MERRor:SDEVIATION?" !Returns standard deviation magnitude error.

FETCh:WWQuality:OOFFSET[:MAXimum]?

Function	Queries the average origin offset .
Query	Range:-99 to 0 dB, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:OOFFSET:MAXIMUM?" !Returns maximum origin offset.

FETCh:WWQuality:OOFset:ALL?

Function	Queries the origin offset measurements. Results are returned in the following order: minimum, maximum, average, standard deviation origin offset .
Query	<p>Minimum Origin Offset</p> <ul style="list-style-type: none"> • Range: -99 to 0 dB, 9.91 E+37 • Resolution: 0.1 <p>Maximum Origin Offset</p> <ul style="list-style-type: none"> • Range: -99 to 0 dB, 9.91 E+37 • Resolution: 0.1 <p>Average Origin Offset</p> <ul style="list-style-type: none"> • Range: -99 to 0 dB, 9.91 E+37 • Resolution: 0.1 <p>Standard Deviation Origin Offset</p> <ul style="list-style-type: none"> • Range: 0 to 99 dB, 9.91 E+37 • Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:OOFset:ALL?"
!Returns minimum, maximum, average, and standard deviation origin offset.
```

FETCh:WWQuality:OOFset:AVERAge?

Function	Queries the average origin offset .
Query	<p>Range: -99 to 0 dB, 9.91 E+37</p> <p>Resolution: 0.1</p>
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:OOFset:AVERAGE?" !Returns average origin offset.
```

FETCh:WWQuality:OOffset:MINimum?

Function	Queries the minimum origin offset .
Query	Range:-99 to 0 dB, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:OOffset:MINIMUM?" !Returns minimum origin offset.

FETCh:WWQuality:OOffset:SDEviation?

Function	Queries the standard deviation of results for origin offset measurements.
Query	Range: 0 to 99 dB, 9.91 E+37 Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:OOffset:SDEVIATION?" !Returns standard deviation origin offset.

FETCh:WWQualityPERRor[:MAXimum]?

Function	Queries the maximum phase error.
Query	Range: 0 to 180 degrees, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:PERROR:MAXIMUM?" !Returns maximum phase error.

FETCh:WWQuality:PERRor:ALL?

Function	Queries the phase error measurements. Results are returned in the following order: minimum, maximum, average, standard deviation phase error.
Query	<p>Minimum Phase Error</p> <ul style="list-style-type: none"> • Range: 0 to 180 degrees, 9.91 E+37 • Resolution: 0.1 <p>Maximum Phase Error</p> <ul style="list-style-type: none"> • Range: 0 to 180 degrees, 9.91 E+37 • Resolution: 0.1 <p>Average Phase Error</p> <ul style="list-style-type: none"> • Range: 0 to 180 degrees, 9.91 E+37 • Resolution: 0.1 <p>Standard Deviation Phase Error</p> <ul style="list-style-type: none"> • Range: 0 to 180 degrees, 9.91 E+37 • Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:PERRor:ALL?"
!Returns minimum, maximum, average, and standard deviation phase error.
```

FETCh:WWQuality:PERRor:AVERAge?

Function	Queries the average phase error.
Query	<p>Range: 0 to 180 degrees, 9.91 E+37</p> <p>Resolution: 0.1</p>
Requirements	Test Application Revision: A.02.00 and above

Programming Example

```
OUTPUT 714;"FETCh:WWQUALITY:PERRor:AVERAge?" !Returns average phase error.
```

FETCh:WWQuality:PERRor:MINimum?

Function	Queries the minimum phase error.
Query	Range: 0 to 180 degrees, 9.91 E+37 Resolution: 0.1
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:PERRor:MINIMUM?" !Returns minimum phase error.

FETCh:WWQuality:PERRor:SDEVIation?

Function	Queries the standard deviation of results for phase error measurements.
Query	Range: 0 to 180 degrees, 9.91 E+37 Resolution: 0.01
Requirements	Test Application Revision: A.02.00 and above

Programming Example

OUTPUT 714;"FETCh:WWQUALITY:PERRor:SDEVIATION?" !Returns standard deviation phase error.

INITiate Subsystem

Syntax Diagrams and Command Descriptions

[“INITiate” on page 263](#)

Description

INITiate Command Functions

The INITiate subsystem is used to:

- Start (activate) individual or multiple (concurrent) measurements.
- Turn individual measurements off.
- Determine the number of measurements currently active (INIT:COUNT?).
- Determine the names of the measurements currently active (INIT:ON?).
- Determine which measurements are finished (INIT:DONE?).

What Happens When a Measurement is INITiated?

When a measurement is started using INITiate commands, a new measurement cycle is started. If the selected measurement is currently in a measurement cycle, it is aborted. If a timeout is specified, the timeout period begins when a measurement is initiated.

NOTE The INITiate subsystem is derived from SCPI, but has some modifications to make it more compatible with the manual operation of the test set. Most notably, the choice of single or continuous measurement triggering is made using the SETup subsystem.

INITiate Programming Examples (how INIT commands are used)

The INITiate command is used to start measurements. INITiate commands allow multiple measurements to be started without waiting for other measurement processes to complete. For example, the following code starts the Digital Average Power and Waveform Quality measurements, and then uses the INITiate:DONE? command in a loop to query the status of these measurements, see [“Measurement Event Synchronization” on page 164](#).

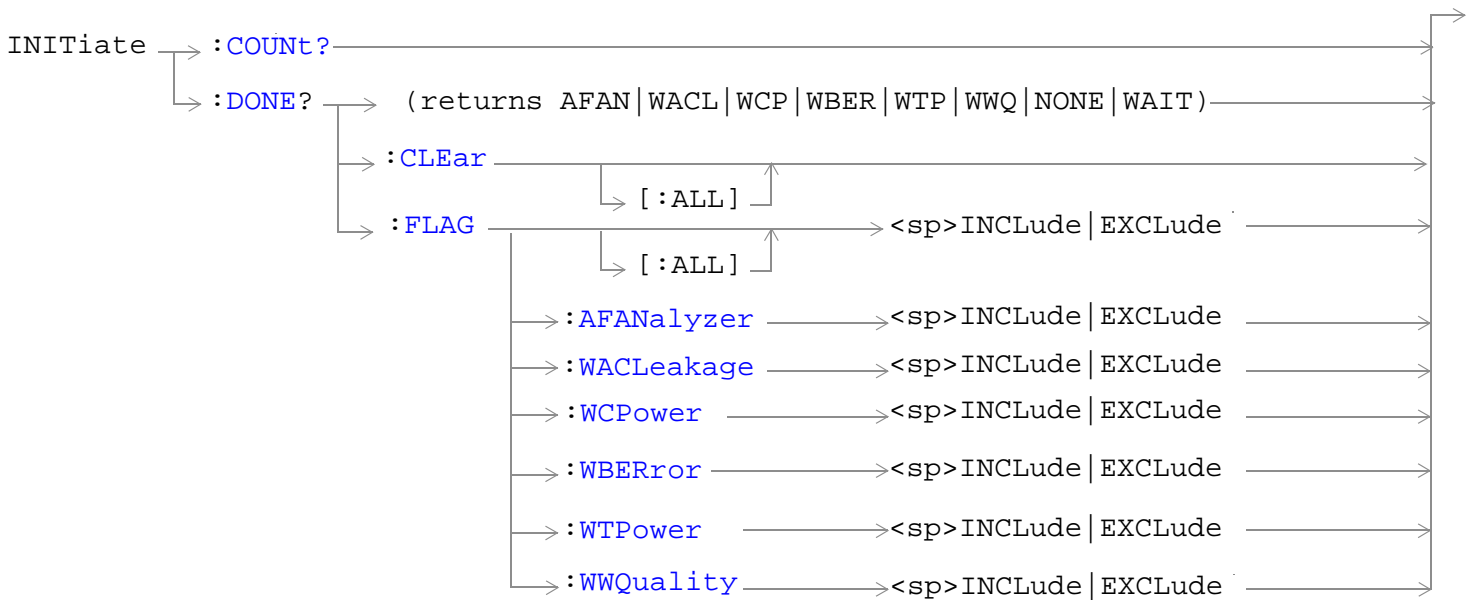
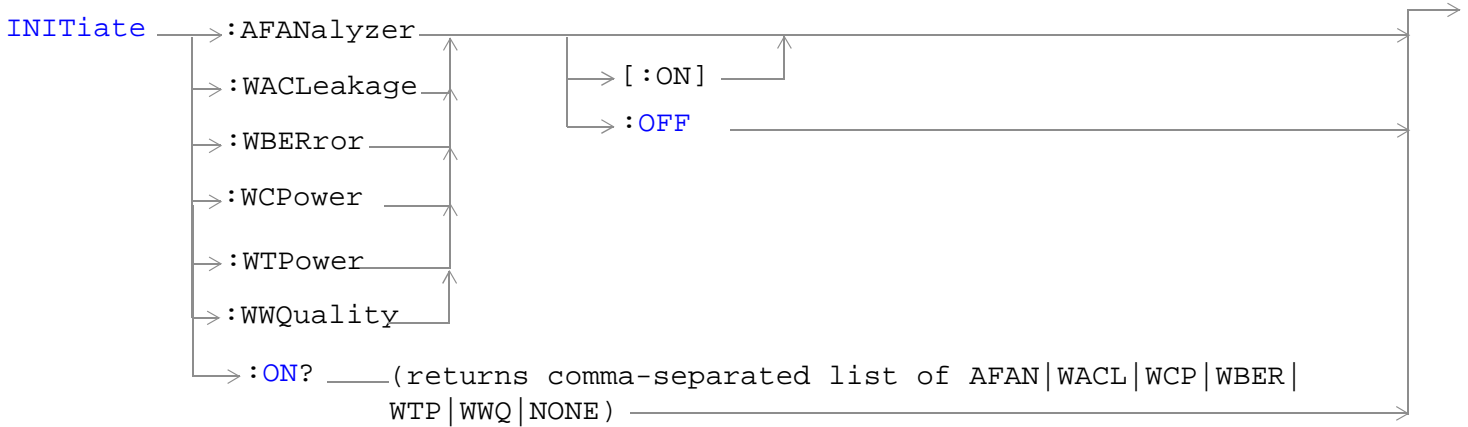
When the measurements are done, the FETCh command is used to acquire the results, and the results are entered into variables in the controlling application. The program ends when the INITiate:DONE? command returns the string “NONE” indicating that all initiated measurements have gone through the measuring state see [“Measurement States” on page 150](#).

INITiate Subsystem

NOTE Trigger arming for each measurement is controlled in the SETup subsystem. The choices are single or continuous. The best practice (during remote operation) is to use single measurement mode. This simplifies the tasks of starting concurrent measurements, then using the INIT subsystem commands to determine which measurements are ready to be FETChed.

```
10 OUTPUT 714;"SETup:ALL:CONTinuous:OFF" ! selects single trigger mode.
20 OUTPUT 714;"INITiate:WBError;WCPower" ! starts loopback BER and
30                                     !channel power measurements.
40 LOOP
50 OUTPUT 714;"INITiate:DONE?" !query to find out if any measurements are done.
60 ENTER 714;Meas_complete$
70 SELECT Meas_complete$
80 CASE "WBError" !tests for the string "WBError", indicating loopback BER measurement is done.
90 OUTPUT 714;"FETCh:WBError?" !Queries loopback BER results.
100 ENTER 714;Integrity,Ber,Ber_count,Bits_tested
110 CASE "WCP" !tests for the string "WCP", indicating channel power measurement is done.
120 OUTPUT 714;"FETCh:WCPow?" !Queries the channel power results.
130 ENTER 714;Integrity,Avg_chan_pow
140 END SELECT
150 EXIT IF Meas_complete$="NONE"
160 END LOOP
170 END
```

INITiate



“Diagram Conventions” on page 168

INITiate

INITiate:<measurement mnemonic>[:ON]

Function	<p>These commands initiate (start) the following measurements:</p> <ul style="list-style-type: none">• AFANalyzer - Audio Frequency Analyzer measurements• WACLLeakage - Adjacent Channel Leakage• WCPower - Channel Power measurement• WBERror - Loopback Bit Error Ratio measurement• WTPower - Thermal Power measurement• WWQuality - Waveform Quality measurement <p>This command also queries the active state using the ON? keyword in place of a measurement mnemonic.</p> <p>The INITiate command is associated with the SETup “SETup Subsystem” on page 283 and the “FETCh? Subsystem” on page 223.</p> <p>One or more measurements can be initiated with the same program line (see “Concurrent Measurements” on page 144 and the Programming Example below).</p> <p>This command is also used to activate a measurement. See “INITiate Programming Examples (how INIT commands are used)” on page 261.</p>
Range	AFAN WACL WCP WBER WTP WWQ
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:WCPOWER;WQUALITY:ON" !Initiates a channel power and a waveform quality measurement.</pre>	

INITiate:ON?

Function	Queries the measurements that are on. Returns a comma separated list of measurement mnemonics.
Query	Range: AFAN WACL WCP WBER WTP WWQ NONE
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:ON?"</pre>	

INITiate:<measurement mnemonic>:OFF

Function	Deactivates the selected measurement. See “Measurement States” on page 150 . Only one measurement can be deactivated at a time. To stop one or more measurements and leave them in the active state, use “ABORt” on page 171 .
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:WCPOWER:OFF" !Deactivates the channel power measurement.</pre>	

INITiate:COUNt?

Function	Queries the number of measurements that have been initiated (are active). See “Measurement States” on page 150 .
Query	Range: 0 to 10
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:COUNt?"</pre>	

INITiate:DONE?

Function	Queries (one at a time) which measurements, if any, are finished or have timed-out. See “Measurement Event Synchronization” on page 164 for how to use this command. See “Measurement States” on page 150 to understand the test set’s measurement states. See “INITiate:DONE:FLAG:<measurement mnemonic>” on page 266 for include or exclude commands.
Requirements	Test Application Revision: A.02.00 and above
Query	Range: AFAN WACL WCP WBER WTP WWQ NONE WAIT

INITiate:DONE:CLEAr

Function	Clears the done flag from all measurements.
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:DONE:CLEAr" !Clears the done flag.</pre>	

INITiate

INITiate:DONE:FLAG[:ALL]

Function	<p>Specifies that all measurements are either included or excluded when the INITiate:DONE? query is sent.</p> <p>If a measurement trigger arm is left in continuous mode, the done flag for that measurement will toggle between DONE and WAIT. The INITiate:DONE? query will probably not be able to catch the measurement at the instant it is done; therefore, the measurement will never appear to be done. If a measurement's triggering must be continuously armed, you should exclude the measurement using "INITiate:DONE:FLAG:<measurement mnemonic>" .</p> <p>Use INITiate:DONE:FLAG:ALL EXCLude to exclude all measurements.</p> <p>Once INITiate:DONE:FLAG has been set to EXCLude for a measurement, the user must send the INCLude command for that measurement in order to query that measurement with the INITiate:DONE? query. The test set will not reset any excluded measurement with any type of preset.</p>
Setting	Range: INCLude EXCLude
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:DONE:FLAG:ALL INCLUDE"</pre> <p>!Includes all measurements in the INITIATE:DONE? query.</p>	

INITiate:DONE:FLAG:<measurement mnemonic>

Function	<p>Specifies if a measurement done flag is considered (using the INCLude or EXCLude settings) when the INITiate:DONE? query is sent.</p> <p>If more than one measurement is active, and one or more measurement trigger arm states is continuous, the INITiate:DONE? query may not be effective. The best solution is to change the arm state of all measurements to single using the "SETup[:ALL]:CONTInuous" command. However, if a measurement must be continuously triggered, you should exclude the measurement using the EXCLude setting provided by this command if you want to use INITiate:DONE? to query measurement done status.</p> <p>The test set will not reset any excluded measurement to included with any type of preset.</p>
Setting	Range: INCLude EXCLude
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"INITIATE:DONE:FLAG:WAP EXCLUDE"</pre> <p>!Excludes the average power measurement from responding to the INITIATE:DONE? query.</p>	

READ? Subsystem

Syntax Diagram and Command Descriptions

[“READ” on page 269](#)

Description

The READ? command provides a sequential method to make measurements and retrieve the results. READ? will hang the GPIB bus until the measurement is completed, or until the timeout value has been exceeded. Associated SETUp commands (for each measurement) are used with the READ? command to retrieve desired measurement results in a sequential manner.

Sending a READ? command is equivalent to an INITiate/FETCh cycle for a measurement. A READ? command executes an abort action on that measurement followed by an INITiate and a FETCh?.

READ? commands can be mixed with FETCh? queries in order to make combinations of sequential and overlapped operations. One measurement can be issued a READ? command (sequential), and the next measurement can be issued INITiate/FETCh? commands (overlapped), if necessary.

The advantage of using the READ? commands to obtain measurement results, as opposed to the INITiate/FETCh method is:

- It is simpler. Fewer commands are required to obtain measurement results.

Some disadvantages of using READ? over INITiate and FETCh are:

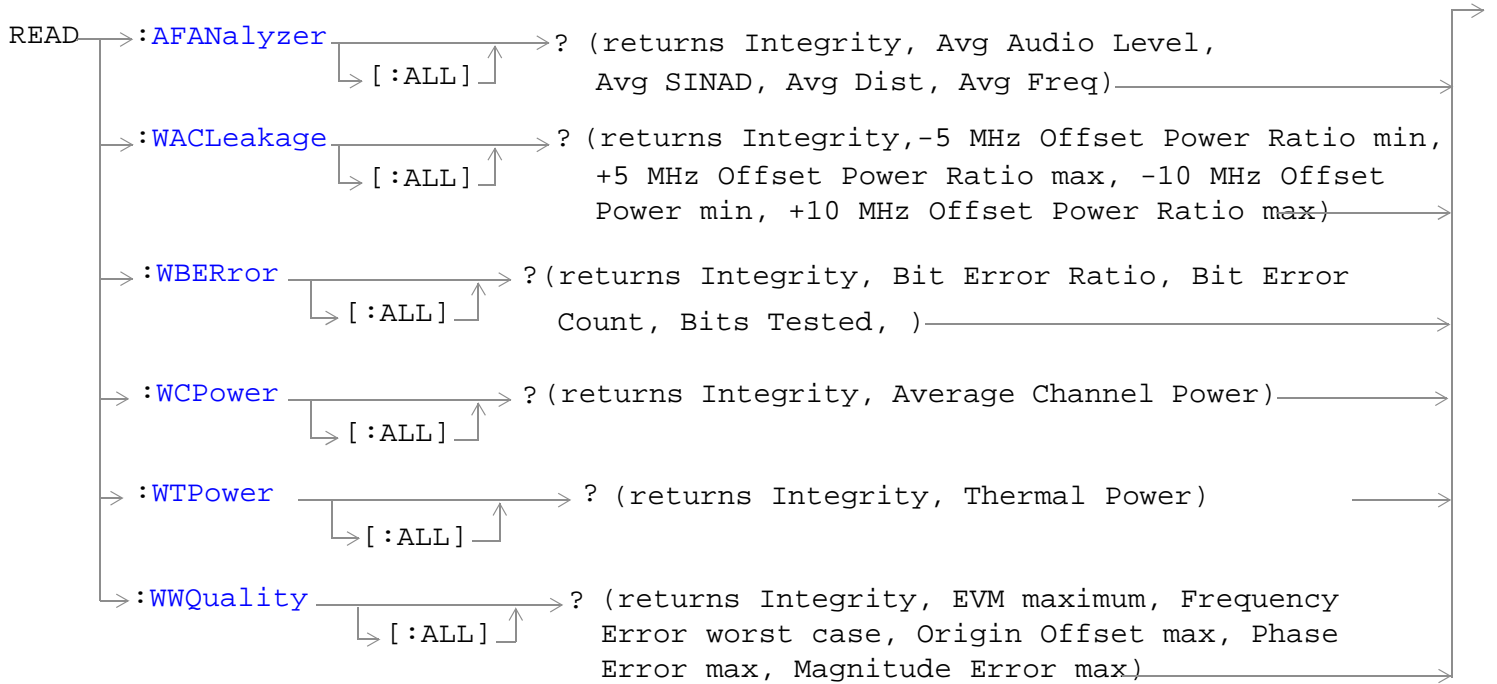
- The test set does not process any additional GPIB commands until the requested measurement results are available.
- The sequential nature of the READ? command does not allow the user to make concurrent measurements. Concurrent measurements require the overlapped commands INITiate, DONE? and FETCh? .
- The READ? command does not provide measurement results such as statistics that are available using the INITiate/FETCh method.
- The READ? commands have pre-defined measurement results. If additional results are needed from a measurement they may be obtained with a FETCh? query.

NOTE Trigger arming for each measurement is controlled in the SETUp subsystem. Best practice during remote operation is to set trigger arm to single (Continuous Off).

Program Example - READ:WTPower?

```
OUTPUT 714;"READ:WTPower?" !Starts a thermal power measurement. As soon as the
!measurement cycle has completed, the test set
!provides the thermal power measurement results to the
!controlling application.
ENTER 714;Integrity, Thermal_power !Enters the integrity indicator and the
!thermal power measurement values into
!the controlling application.
```

READ



“Diagram Conventions” on page 168

READ

READ:AFANalyzer[:ALL]?

Function	Initiates and fetches an audio frequency analyzer measurement as a sequential operation. Measurement results are returned in the following order: integrity, average audio level, average SINAD, average audio distortion.
Query	Integrity <ul style="list-style-type: none">• Range: 0 to 23 see “Integrity Indicator”• Resolution: 1 Average audio level <ul style="list-style-type: none">• Range: 0 to 20 volts, 9.91 E+37• Resolution: the lesser of 4 significant digits or 10 uV. Average SINAD <ul style="list-style-type: none">• Range: -99.00 to 99.00 dB, 9.91 E+37• Resolution: 0.01 dB Average audio distortion <ul style="list-style-type: none">• Range: 0.00 to 99.00%, 9.91 E+37• Resolution: 0.01%
Requirements	Test Application Revision: A.02.00 and above

READ:WACLeakage[:ALL]?

Function	Initiates and fetches an adjacent channel leakage ratio measurement as a sequential operation. Measurement results are returned in the following order: integrity, -5 MHz minimum offset power ratio, +5 MHz maximum offset power ratio, -10 MHz minimum offset power ratio, +10 MHz maximum offset power ratio. If the measurement state of any offset is set to OFF, the result for that offset will be 9.91 E+37.
Query	<ul style="list-style-type: none">• Range: -100 to 100 dBm• Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

READ:WBER?

Function	Initiates and fetches a loopback bit error ratio measurement as a sequential operation. Measurement results are returned in the following order: integrity, bit error ratio, bit error count, bits tested.
Query	<p>Range</p> <ul style="list-style-type: none"> • Integrity: 1 to 23 • Bit Error Ratio: 0 to 99%, 9.91 E+37 • Bit Error Count: 0 to 999999, 9.91 E+37 • Bits Tested: 0 to 999999, 9.91 E+37 <p>Resolution</p> <ul style="list-style-type: none"> • Integrity: 1 • Bit Error Ratio: 0.0001 dB • Bit Error Count: 1 • Bits Tested: 1
Requirements	Test Application Revision: A.02.00 and above

READ:WCPower[:ALL]?

Function	Initiates and fetches a channel power measurement as a sequential operation. Measurement results are returned in the following order: integrity, average channel power. If the multi-measurement state is on, the result represents the average of a number of channel power measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see " SETup:WCPower:COUNT[:SNUMBER] ".
Query	<ul style="list-style-type: none"> • Range: -99 to 99 dBm • Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

READ

READ:WTPower[:ALL]?

Function	Initiates and fetches a thermal power measurement as a sequential operation. Measurement results are returned in the following order: integrity, thermal transmit power. If the multi-measurement state is on, the result represents the <i>average</i> of a number of thermal power measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see “ SETup:WTPower:COUNT[:SNUMBER] ” .
Query	<ul style="list-style-type: none">• Range: -99 to 99 dBm, 9.91 E+37• Resolution: 0.01 dB
Requirements	Test Application Revision: A.02.00 and above

READ:WWQuality[:ALL]?

<p>Function</p>	<p>Initiates and fetches the waveform quality measurements as a sequential operation.</p> <p>Measurement results are returned in the following order: integrity, EVM maximum, frequency error worst case, origin offset maximum, phase error maximum, magnitude error maximum.</p> <p>If the multi-measurement state is on, each result represents the <i>average</i> of a number of waveform quality measurements. Multi-measurement state, by default, is off. To set up multi-measurements, see “SETup:WWQuality:COUNt[:SNUMber]” .</p>
<p>Query</p>	<p>Integrity</p> <ul style="list-style-type: none"> • Range: 0 to 16 • Resolution: 1 <p>EVM Maximum</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1 <p>Frequency Error worst case</p> <ul style="list-style-type: none"> • Range-99.99 to 99.99 kHz, 9.91 E+37 • Resolution: 0.1 <p>Origin Offset Maximum</p> <ul style="list-style-type: none"> • Range: -99 to 0 dB, 9.91 E+37 • Resolution: 0.1 <p>Phase Error Maximum</p> <ul style="list-style-type: none"> • Range: 0 to 180 degrees, 9.91 E+37 • Resolution: 0.1 <p>Magnitude Error Maximum</p> <ul style="list-style-type: none"> • Range: 0 to 99%, 9.91 E+37 • Resolution: 0.1
<p>Requirements</p>	<p>Test Application Revision: A.02.00 and above</p>

RFANalyzer Subsystem

Description

The RFANalyzer command subsystem performs “lower-level” functions that control the test set's measuring receiver. The measuring receiver includes three separate signal paths:

- Power detector
- Demodulation
- Measurement

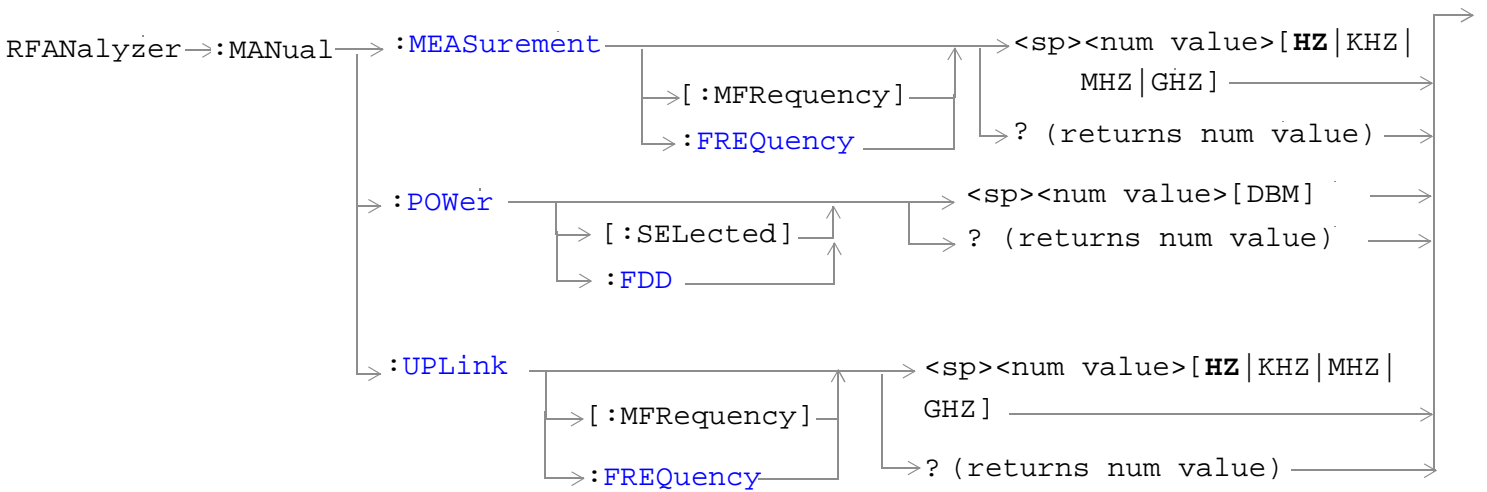
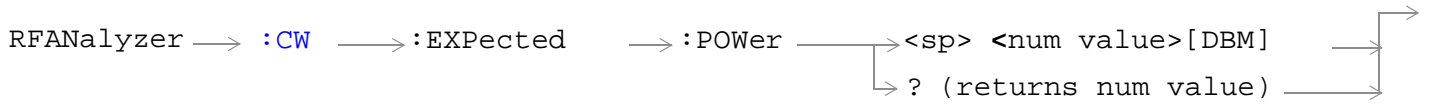
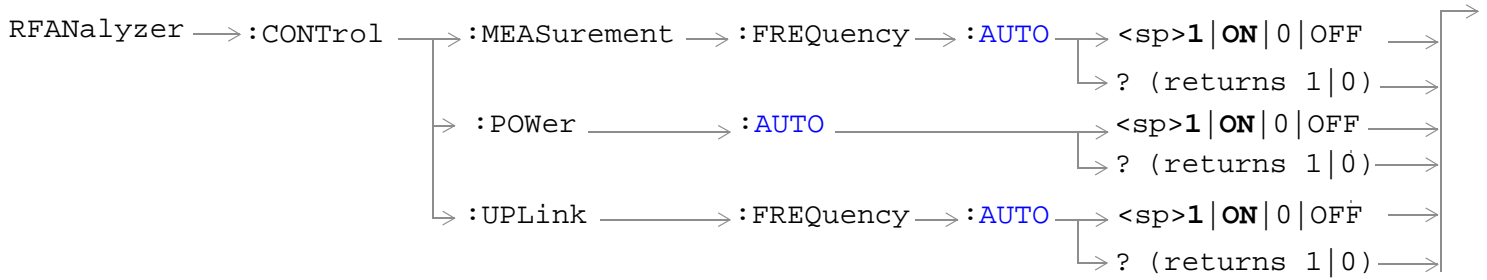
Refer to the [“Block Diagram” on page 486](#) for a description of the signal paths.

The RFANalyzer commands allow manual settings to the tune frequency or expected power level to each of these paths if it is necessary to override automatic settings.

Syntax Diagrams and Command Descriptions

[“RFANalyzer” on page 275](#)

RFAnalyzer



[“Diagram Conventions” on page 168](#)

RFAnalyzer:CONTROL:MEASUREMENT:FREQUENCY:AUTO

Function	Turns on/off the auto Meas Frequency feature which determines the measurement downconverter signal path frequency control mode. (See " Block Diagram " .) ON = automatic OFF = manual
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"RFAnalyzer:CONTROL:MEASUREMENT:FREQUENCY:AUTO OFF" !Enables manual control of the measurement signal path tune frequency.</pre>	

RFAnalyzer:CONTROL:POWER:AUTO

Function	Sets/queries the test set's receiver input power control mode. ON = automatic OFF = manual
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"RFANALYZER:CONTROL:POWER:AUTO OFF" !Enables manual control of the expected input power level.</pre>	

RFAnalyzer:CONTROL:UPLink:FREQUENCY:AUTO

Function	Sets/queries the test set's demodulation signal path tune frequency control mode. ON = automatic OFF = manual.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"RFANALYZER:CONTROL:UPLINK:FREQUENCY:AUTO OFF" !Enables manual control of the demodulation signal path tune frequency.	

RFAnalyzer:CW:EXPECTED:POWER

Function	Sets/queries the expected CW receiver input power. This setting is only used when the Operating Mode is set to CW. (See " CALL[:CELL]:OPERating " .)
Setting	Range: -60 dBm to +53 dBm
Query	Range: -60 dBm to +53 dBm
*RST setting	+13 dBm
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"RFANALYZER:CW:EXPECTED:POWER -20"	

RFANalyzer:MANual:POWer[:SElected]

Function	<p>Sets/queries the receiver expected input power when the test set's receiver input power control mode is set to manual. See “Power Control (Except for CW Mode)” .</p> <p>The optional [:SElected] keyword in this command specifies that the expected input power setting being queried applies to the current system type.</p> <p>The test set's receiver power control mode is set by the “RFANalyzer:CONTRol:POWer:AUTO” command.</p> <p>The test set's measuring receiver will consider any amplitude offsets that are defined along with this setting to calculate input power range settings.</p>
Setting	<p>Range: Test application and system type dependent (approximately -25 to +43 dBm).</p> <p>Resolution: 0.01 dBm</p>
Query	Range: Test application and system type dependent (approximately -25 to +43 dBm).
*RST setting	-75 dBm
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"RFANALYZER:MANUAL:POWER:SELECTED 24 DBM" !Sets the manual power control mode expected input power level for the currently selected system type to 24 dBm.</pre>	

RFANalyzer:MANual:POWer:FDD

Function	<p>Sets/queries the sets the measurement and demod receivers expected input power when UTRA FDD is the current system type and the receiver input power control is set to Manual. See “Power Control (Except for CW Mode)” .</p> <p>The test set's receiver power control mode is set by the “RFANalyzer:CONTRol:POWer:AUTO” command.</p> <p>The test set's measuring receiver will consider any amplitude offsets that are defined along with this setting to calculate input power range settings.</p>
Setting	<p>Range: -129 to +80 dBm (-79 dBm to +30 dBm actual hardware range with amplitude offset = 0)</p> <p>Resolution: 0.01 dBm</p>
Query	Range: -129 to +80 dBm (-79 dBm to +30 dBm actual hardware range with amplitude offset = 0)
*RST setting	0 dBm
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"RFANALYZER:MANUAL:POWER:FDD 24 DBM" !Sets the manual power control mode expected input power level for the FDD system type to !24 dBm.</pre>	

RFANalyzer:MANual:MEASurement[:MFRequency]

Function	<p>The setting form of this command performs two functions: (1) sets the Meas Frequency of the test set's measurement signal path, and (2) selects manual (auto off) tune mode for the test set's measurement signal path. (See "Block Diagram" .)</p> <p>The query form of this command returns the tune frequency of the test set's measurement signal path.</p> <p>The tune mode for the test set's measurement signal path can be returned to auto using the "RFANalyzer:CONTRol:MEASurement:FREQuency:AUTO" command.</p>
Setting	<p>Range: 292.5 MHz to 2700 MHz</p> <p>Resolution: 0.1 Hz</p>
Query	Range: 292.5 MHz to 2700 MHz
*RST setting	896 MHz
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"RFANALYZER:MANUAL:MEASUREMENT:MFREQUENCY 942.6 MHZ" !Enables manual control of the measurement signal path tune frequency and sets the tune frequency to 942.6 MHz.</pre>	

RFANalyzer:MANual:MEASurement:FREQuency

Function	<p>Sets/queries Meas Frequency, the measurement downconverter signal path frequency control mode. (See "Block Diagram" .)</p> <p>This setting is applied when manual mode is selected (see "RFANalyzer:CONTRol:MEASurement:FREQuency:AUTO").</p>
Setting	<p>Range: 292.5 MHz to 2700 MHz</p> <p>Resolution: 0.1 Hz</p>
Query	Range: 292.5 MHz to 2700 MHz
*RST setting	896 MHz
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"RFANALYZER:MANUAL:MEASUREMENT:FREQUENCY 942.6 MHZ" !Sets the measurement signal path tune frequency to 942.6 MHz when manual control mode is used.</pre>	

RFANalyzer:MANual:UPLink[:MFRequency]

Function	<p>The setting form of this command performs two functions: (1) sets the tune frequency of the test set's demodulation signal path, and (2) selects manual tune mode for the test set's demodulation signal path.</p> <p>The query form of this command returns the tune frequency of the test set's demodulation signal path.</p> <p>The tune mode for the test set's demodulation path can be returned to auto using the "RFANalyzer:CONTRol:UPLink:FREQuency:AUTO" command.</p>
Setting	<p>Range: 292.5 MHz to 2700 MHz</p> <p>Resolution: 0.1 Hz</p>
Query	Range: 292.5 MHz to 2700 MHz
*RST setting	896 MHz
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"RFANALYZER:MANUAL:UPLINK:MFREQUENCY 1955.030 MHZ"</pre> <p>!Enables manual control of the demodulation signal path tune frequency and sets the tune frequency !to 1955.030 MHz.</p>	

RFANalyzer:MANual:UPLink:FREQuency

Function	<p>Sets/queries the tune frequency of the test set's demodulation signal path.</p> <p>This setting is applied when manual mode is selected (see "RFANalyzer:CONTRol:UPLink:FREQuency:AUTO").</p>
Setting	<p>Range: 292.5 MHz to 2700 MHz</p> <p>Resolution: 0.1 Hz</p>
Query	Range: 292.5 MHz to 2700 MHz
*RST setting	896 MHz
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"RFANALYZER:MANUAL:UPLINK:FREQUENCY 942.6 MHZ"</pre> <p>!Sets the test set's demodulation signal path tune frequency to 942.6 MHz.</p>	

RFGenerator Subsystem

Description

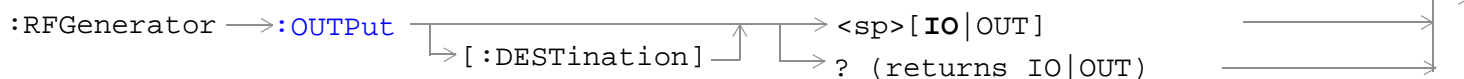
The RFGenerator subsystem selects the RF generator output port on test sets equipped with both the RF IN/OUT port and the RF OUT ONLY port. If the test set does not have the RF OUT ONLY port, an error message is generated when attempting to switch output ports.

The RF OUT ONLY port may not be used with some test applications or lab applications. In that case, a message is displayed that tells you that the port could not be switched.

Syntax Diagrams and Command Descriptions

[“RFGenerator: OUTPut” on page 282](#)

RFGenerator:OUTPUT



[“Diagram Conventions” on page 168](#)

RFGenerator:OUTPUT[:DESTINATION]

Function	Sets/queries the RF output port destination: RF IN/OUT (IO) or RF OUT ONLY (OUT). If the correct hardware is not installed when trying to change to the RF OUT ONLY port, the test set displays the following error: Hardware error; RFIO version does not support RF out only selection. The query form will always return a value, regardless of the hardware version.
Setting	Range: 292 MHz to 2700 MHz Resolution: 0.1 Hz
Query	Range: 292 MHz to 2700 MHz Resolution: 0.1 Hz
*RST Setting	851 MHz
Requirements	Test Application Revision: A.02.00 and above Hardware: RF Input/Output module with second RF output connector, modified front panel.
Programming Example <pre>OUTPUT 714;"RFGENERATOR:OUTPUT:DESTINATION OUT" !Sets the RF generator's output destination to the RF Out Only port.</pre>	

SETup Subsystem

Description

The SETup subsystem is used to configure the test set for each measurement. Typical settings include:

- Multi-Measurement Count, how many measurements will be made each time a measurement is initiated.
- Trigger Arm, determines if a measurement will make one measurement then return to idle (single), or automatically rearm on completion of a measurement and repeat the process (continuous).
- Trigger Source, how a measurement is triggered.
- Trigger Delay, controls the delay time between the trigger and the start of sampling.
- Measurement Timeout, length of time before a measurement times out.

NOTE Trigger arming for each measurement is controlled in the SETup subsystem. The choices are single or continuous. In most cases, it is a best practice (during remote operation) to use “single” measurement mode. This simplifies the tasks of starting concurrent measurements, using the INIT subsystem commands to determine which measurements are ready to be fetched, then using the FETCh subsystem to obtain results. The command “SETup:CONTInuous:OFF sets all measurements to “single” trigger mode.

Syntax Diagrams and Command Descriptions

[“SETup:AFANalyzer” on page 285](#)

[“SETup:WACLeakage” on page 294](#)

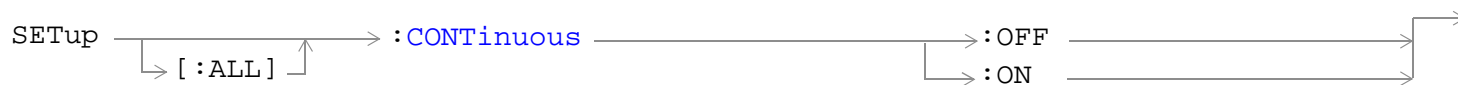
[“SETup:WBError” on page 300](#)

[“SETup:WCPower” on page 303](#)

[“SETup:WTPower” on page 308](#)

[“SETup:WWQuality” on page 312](#)

SETup[:ALL]:CONTInuous

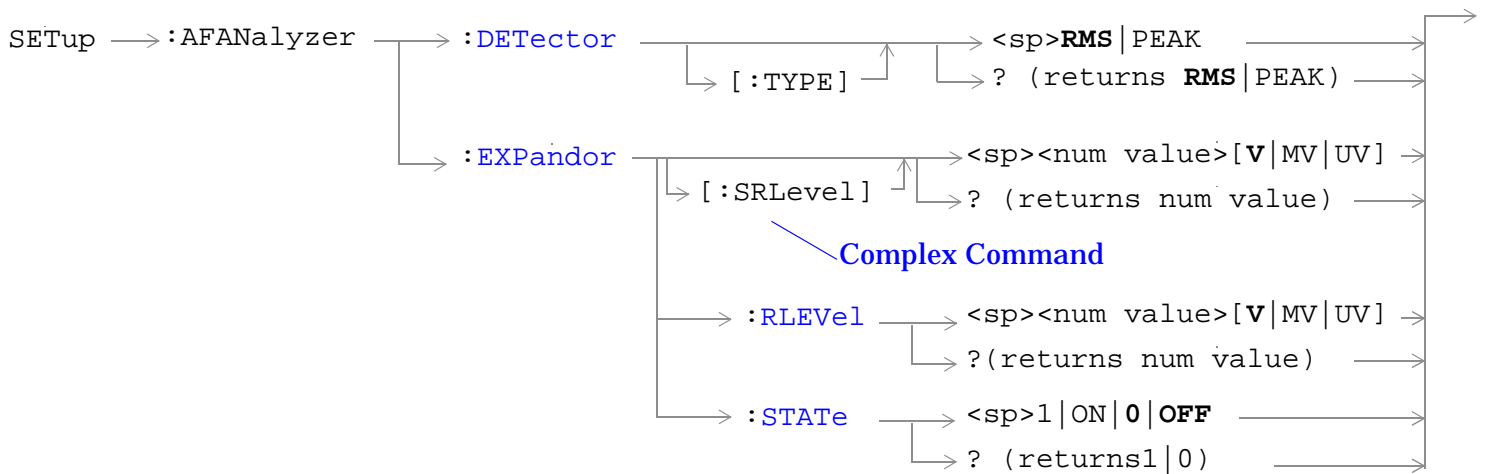
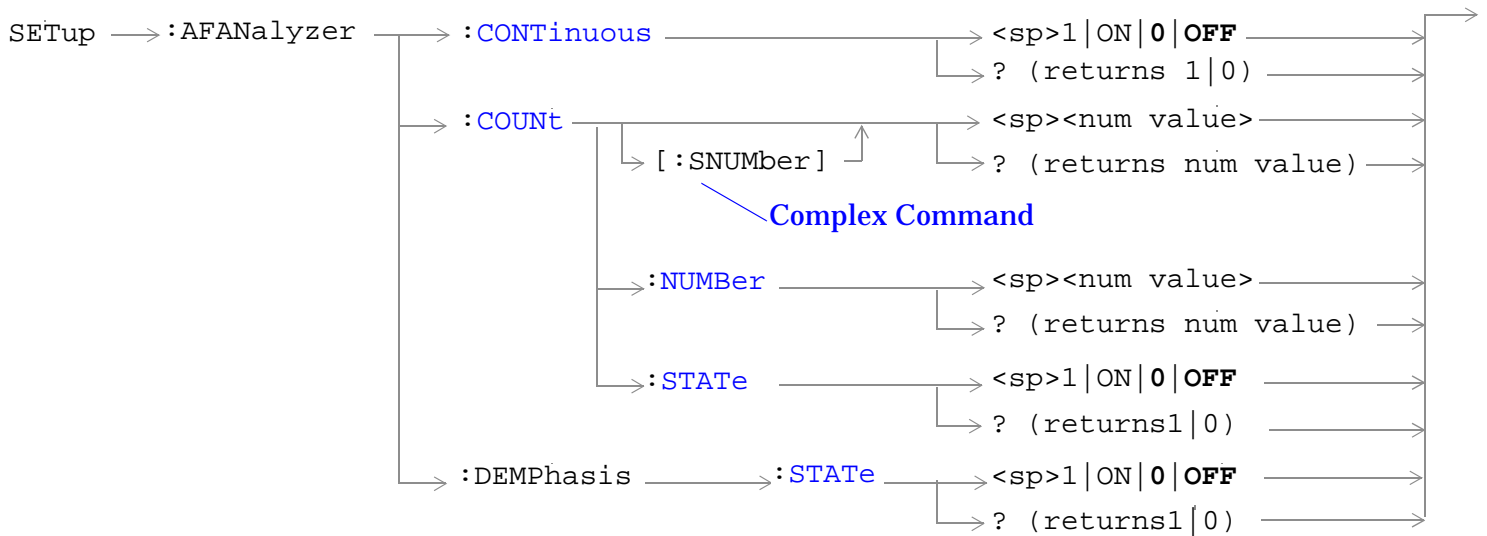


“Diagram Conventions” on page 168

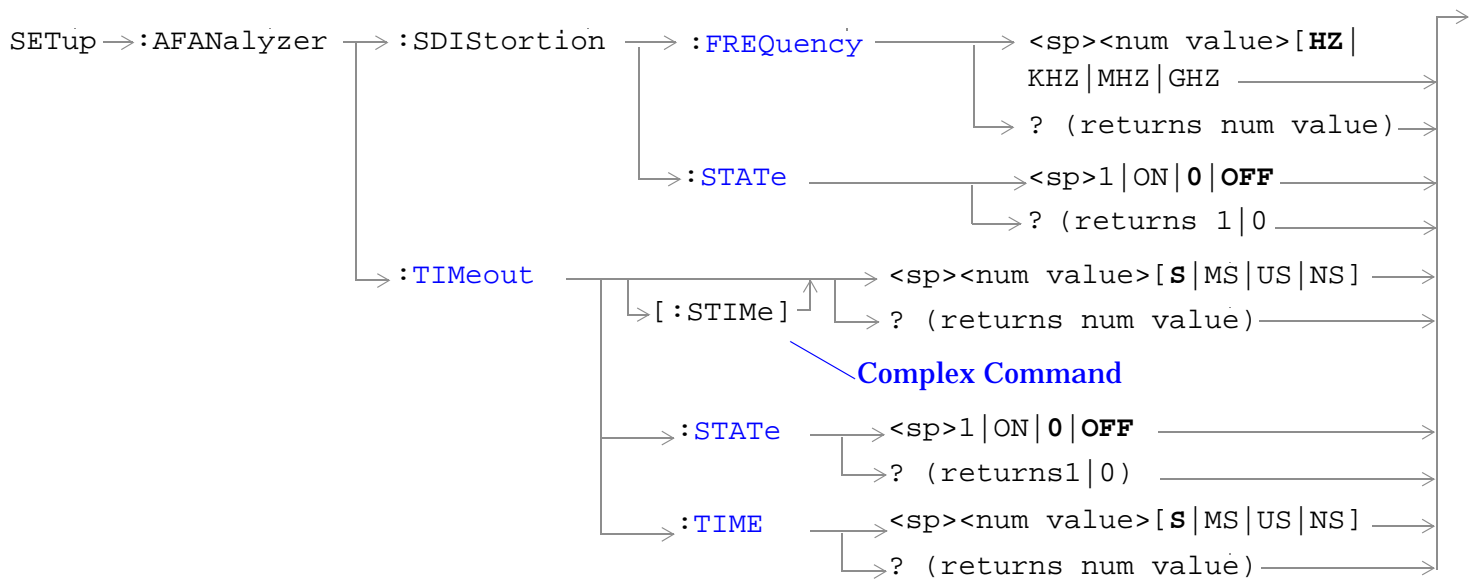
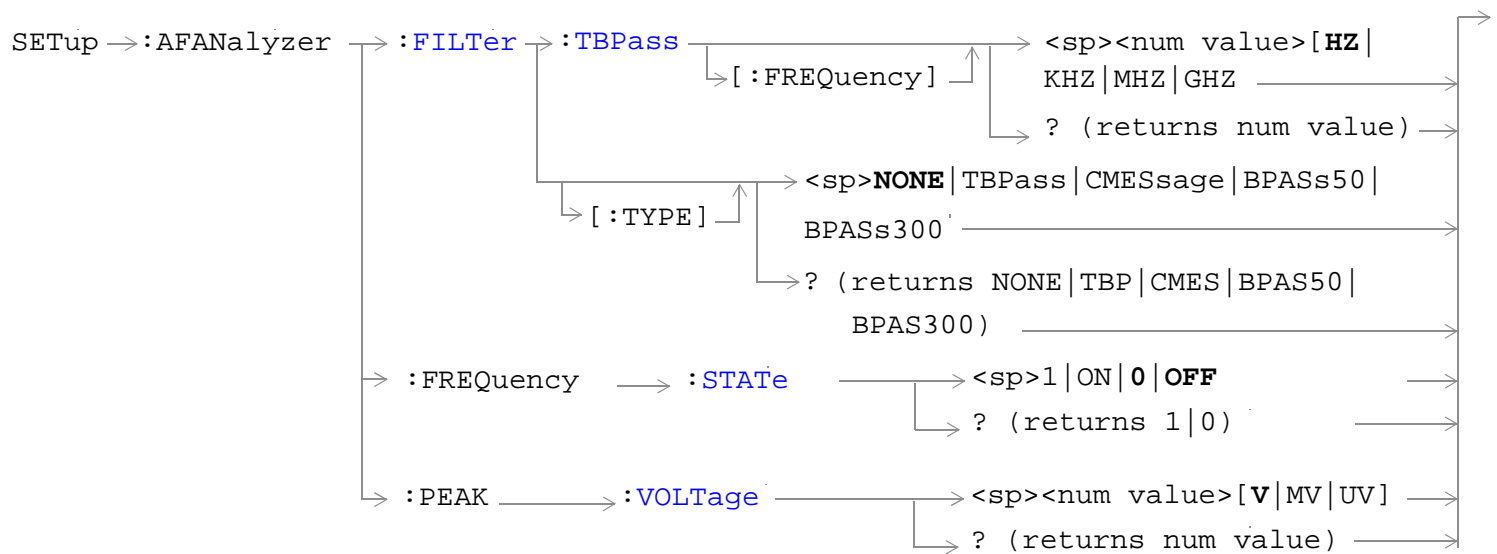
SETup[:ALL]:CONTInuous

Function	Sets/queries the trigger arm state for all measurements. Determines whether all measurements will make one measurement then stop (OFF (single)), or automatically rearm upon completion of one measurement and repeat the process (ON (continuous)). This setting overrides previously set trigger arm settings for individual measurements.
Setting	Range: ON, OFF
Programming Example	
OUTPUT 714;"SETup:ALL:CONTInuous:OFF" !Sets all measurements to single trigger mode.	

SETup:AFANalyzer



SETup:AFANalyzer



“SETup Subsystem” on page 283

SETup:AFANalyzer:CONTInuous

Function	Sets/queries the trigger arm state for the AF analyzer measurement. Determines whether measurement will make one measurement then stop (0 OFF (single)), or automatically rearm upon completion of one measurement and repeat the process (1 ON (continuous)).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:AFANALYZER:CONTINUOUS OFF" !Sets measurement to single trigger mode.</pre>	

SETup:AFANalyzer:COUNT[:SNUMBER]

Function	Sets/queries the number of AF analyzer measurements to be made in a multi-measurement setup. This command sets the count, and automatically sets the multi-measurement STATE command to 1 (on).
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	Off (10 when STATE = On)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:AFANALYZER:COUNT:SNUMBER 5" !Turns on multi-measurements and sets the number of measurements to 5.</pre>	

SETup:AFANalyzer

SETup:AFANalyzer:COUNT:NUMBER

Function	Sets/queries the number of AF analyzer measurements to be made when multi-measurement state is ON.
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	10
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:COUNT:NUMBER 5" !Sets the number of measurements to 5 when the multi-measurement state is set to ON.	

SETup:AFANalyzer:COUNT:STATE

Function	Sets/queries the multi-measurement state of the AF analyzer measurement.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:COUNT:STATE ON" !Turns on multi-measurements.	

SETup:AFANalyzer:DEMPHasis:STATE

Function	Sets/queries whether 750 us de-emphasis is enabled.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:DEMPHESIS:STATE ON"	

SETup:AFANalyzer:DETECTOR[:TYPE]

Function	Sets/queries the detector type for audio level measurements.
Setting	Range: RMS PEAK
Query	Range: RMS PEAK
*RST setting	RMS
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:DETECTOR:TYPE PEAK"	

SETup:AFANalyzer:EXPANDOR[:SRLevel]

Function	Sets/queries the expander's reference level and automatically sets the expander's state to ON.
Setting	Range: 10 mV to 10 V Resolution: 1 mV
Query	Range: 10 mV to 10 V
*RST setting	1 V
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:EXPANDOR:SRLEVEL 5V" !Sets expander state to on and level to 5 V.	

SETup:AFANalyzer:EXPANDOR:RLEVEL

Function	Sets/queries the expander's reference level to be used when the expander's state is set to ON.
Setting	Range: 10 mV to 10 V Resolution: 1 mV
Query	Range: 10 mV to 10 V
*RST setting	1 V
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:EXPANDOR:RLEVEL 5V" !Sets expander reference level to 5 V.	

SETup:AFANalyzer:EXPandor:STATe

Function	Sets/queries whether the expandor is enabled.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:EXPANDOR:STATE ON"	

SETup:AFANalyzer:FILTer[:TYPE]

Function	Sets/queries the filter type for audio measurements. Filter choices are as follows: 100 Hz tunable bandpass filter (TBP), C-message filter (CMES), 50 Hz to 15 kHz bandpass filter (BPAS50), 300 Hz to 15 kHz bandpass filter (BPAS300).
Setting	Range: NONE TBPass CMESsage BPASs50 BPASs300
Query	Range: NONE TBP CMES BPAS50 BPAS300
*RST setting	NONE
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:FILTER:TYPE BPASS50" !Selects the 50 Hz to 15 kHz bandpass filter.	

SETup:AFANalyzer:FILTer:TBPass[:FREQuency]

Function	Sets/queries the center frequency for the 100 Hz tunable bandpass filter (TBPass).
Setting	Range: 300.0 to 20000 Hz Resolution: 0.1
Query	Range: 300.0 to 20000 Hz
*RST setting	1000
Requirements	Test Application Revision: A.02.00 and above
Programming Example 10 OUTPUT 714;"SETUP:AFANALYZER:FILTER:TBPASS:FREQUENCY 300HZ"	

SETup:AFANalyzer:FREQUENCY:STATE

Function	Sets/queries whether the audio frequency measurement is enabled.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"SETUP:AFANALYZER:FREQUENCY:STATE ON"	

SETup:AFANalyzer:PEAK:VOLTage

Function	Sets/queries the expected peak voltage for audio measurements.
Setting	Range: 0.001 to 20 Vpk Resolution: 0.001
Query	Range: 0.001 to 20 Vpk
*RST setting	20
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
10 OUTPUT 714;SETUP:AFANALYZER:PEAK:VOLTAGE 10V"	

SETup:AFANalyzer:SDISTORTION:FREQUENCY

Function	Sets/queries the fundamental frequency setting for the SINAD/distortion measurement.
Setting	Range: 100.0 to 10000 Hz Resolution: 0.1
Query	Range: 100.0 to 10000 Hz
*RST setting	1000
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
10 OUTPUT 714;SETUP:AFANALYZER:SDISTORTION:FREQUENCY 300HZ"	

SETup:AFANalyzer:SDIStortion:STATE

Function	Sets/queries whether the SINAD/distortion measurement is enabled.
Setting	Range: 1 0N 0 OFF
Query	Range: 1 0
*RST setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example 10 OUTPUT 714; SETUP:AFANALYZER:SDISTORTION:STATE ON"	

SETup:AFANalyzer:TIMEout[:STIME]

Function	Sets/queries the AF analyzer measurement's timeout setting and automatically sets the timeout state to ON.
Setting	Range: 1 to 999 seconds Resolution: 1 second
Query	Range: 1 to 999
*RST Setting	10 seconds, on
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:TIMEOUT:STIME 5S" !Sets timeout state to ON and sets the timeout time to 5 seconds.	

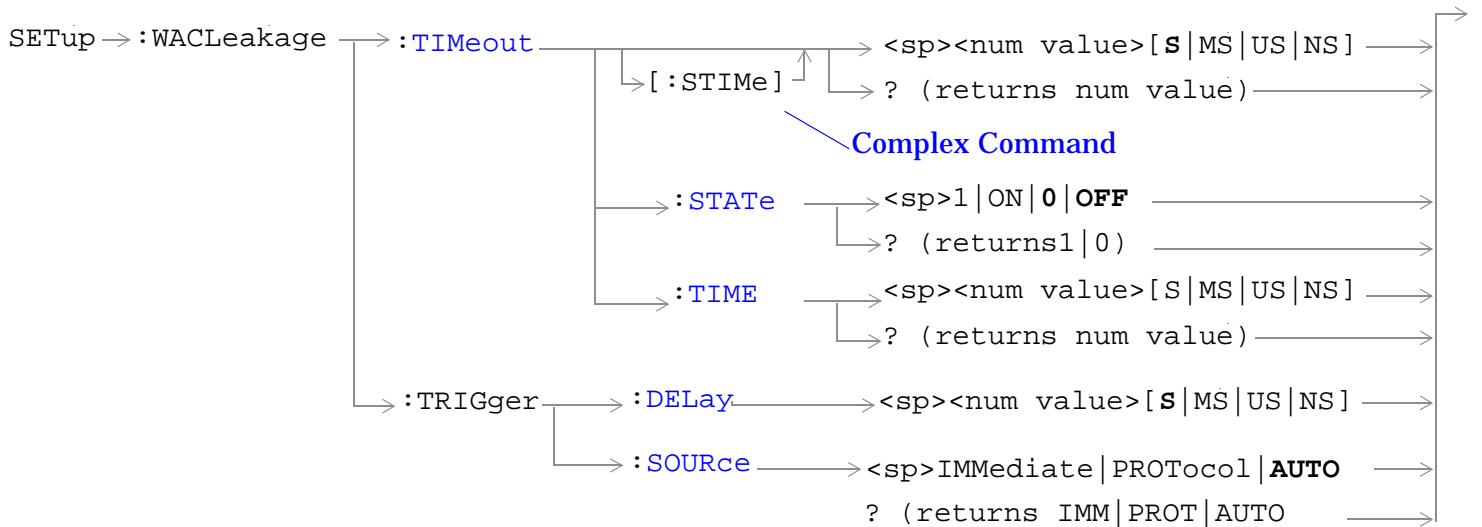
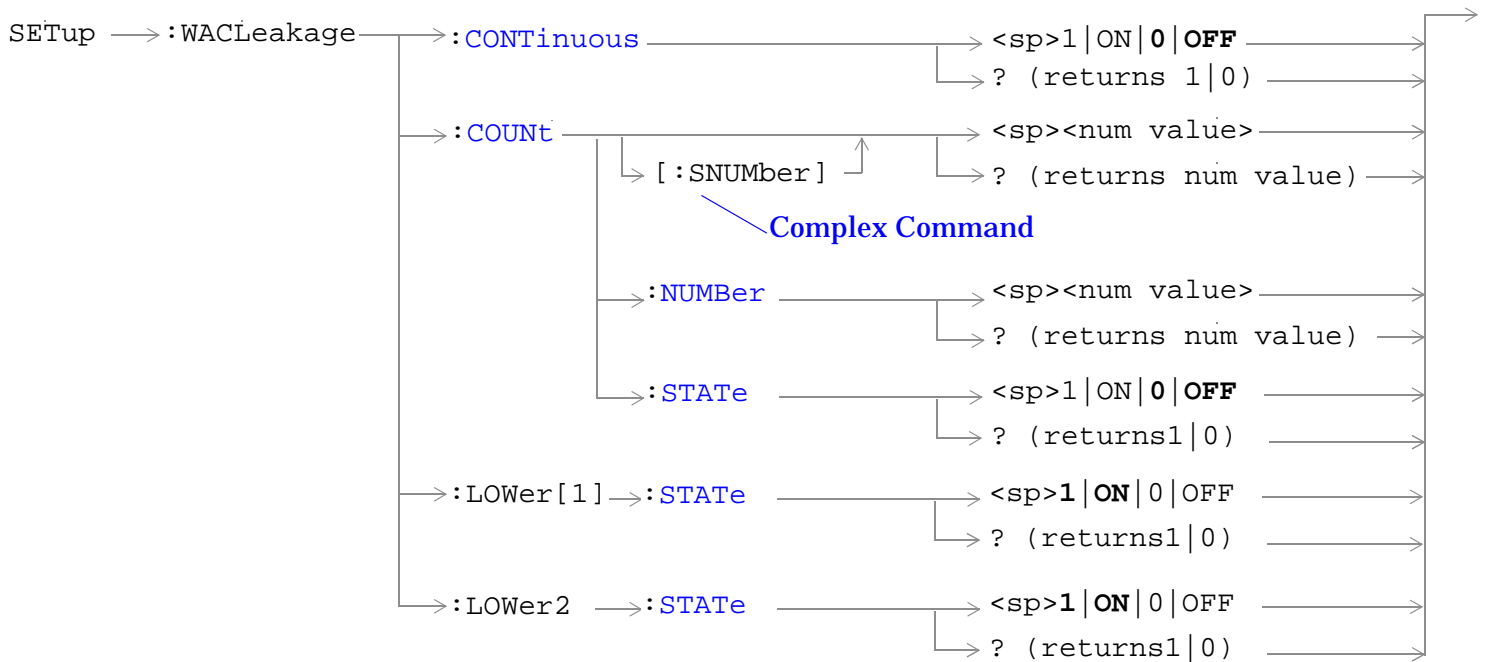
SETup:AFANalyzer:TIMEout:STATE

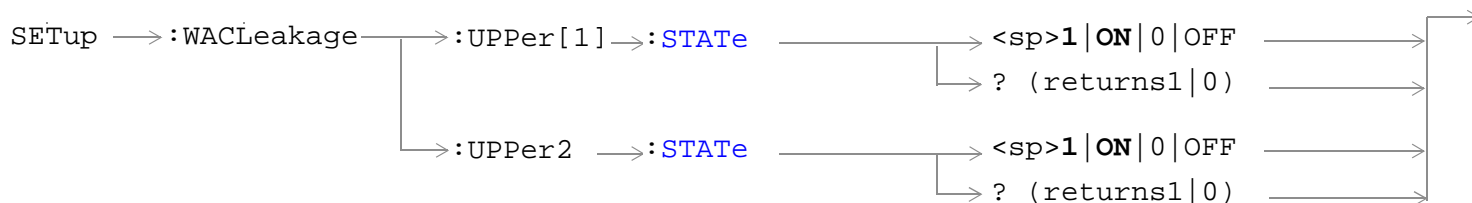
Function	Sets/queries the AF analyzer measurement's timeout state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:AFANALYZER:TIMEOUT:STATE ON"	

SETup:AFANalyzer:TIMEout:TIME

Function	Sets/queries the AF analyzer measurement's timeout setting to be used when the timeout state is set to ON.
Setting	Range: 1 to 999 seconds Resolution: 1 second
Query	Range: 1 to 999
*RST Setting	10 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714 ; "SETUP:AFANALYZER:TIMEOUT:TIME 5S"	

SETup:WACLeakage





[“Diagram Conventions” on page 168](#)

SETup:WACLeakage:CONTInuous

Function	Sets/queries the trigger arm state for the adjacent channel leakage measurement. The trigger arm state determines whether the adjacent channel leakage measurement will be made once then stop (0 OFF (single)), or automatically re-arm upon completion of one measurement and repeat the process (1 ON (continuous)).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre> OUTPUT 714;"SETUP:WACLEAKAGE:CONTINUOUS OFF" !Sets measurement to single trigger mode. </pre>	

SETup:WACLeakage:COUNT[:SNUMber]

Function	<p>The setting form of this command performs two functions: (1) sets the number of adjacent channel leakage measurements to be made in a multi-measurement, and (2) sets the multi-measurement STATE command to 1 (on).</p> <p>The query form returns the number of adjacent channel leakage multi-measurements to be made when multi-measurement state is ON.</p>
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	Off (10 when STATE = On)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre> OUTPUT 714;"SETUP:WACLEAKAGE:COUNT:SNUMBER 5" !Turns on multi-measurements and sets the number of measurements to 5. </pre>	

SETup:WACLeakage

SETup:WACLeakage:COUNT:NUMBER

Function	Sets/queries the number of adjacent channel leakage measurements to be made when the multi-measurement state is ON.
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	10
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WACLEAKAGE:COUNT:NUMBER 5" !Sets the number of adjacent channel leakage multi-measurements to 5.	

SETup:WACLeakage:COUNT:STATE

Function	Sets/queries the adjacent channel leakage multi-measurement state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WACLEAKAGE:COUNT:STATE ON" !Turns on adjacent channel leakage multi-measurements.	

SETup:WACLeakage:LOWer[1]:STATE

Function	Sets/queries the 1st lower adjacent channel's state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WACLEAKAGE:LOW1:STATE 0" !Turns off the lower 1st adjacent channel.	

SETup:WACLeakage:LOWer2:STATe

Function	Sets/queries the 2nd lower adjacent channel's state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"SETUP:WACLEAKAGE:LOW2:STATE 0" !Turns off the lower 2nd adjacent channel.	

SETup:WACLeakage:TIMEout[:STIME]

Function	The setting form of this command performs two functions: (1) sets the adjacent channel leakage measurement's timeout (see " Measurement Timeouts ") value, and (2) sets the adjacent channel leakage measurement's timeout STATE to 1 (on). The query form returns the adjacent channel leakage measurement's timeout value.
Setting	Range: 0.1 to 999.9 seconds Resolution: 0.1 second
Query	Range: 0.1 to 999.9
*RST Setting	10 seconds, on
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"SETUP:WACLEAKAGE:TIMEOUT:STIME 5 S" !Sets timeout state to ON and sets the timeout time to 5 seconds.	

SETup:WACLeakage

SETup:WACLeakage:TIMEout:STATE

Function	Sets/queries the adjacent channel leakage measurement's timeout (see "Measurement Timeouts") state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714 ; " SETUP : WACLEAKAGE : TIMEOUT : STATE ON "	

SETup:WACLeakage:TIMEout:TIME

Function	Sets/queries the adjacent channel leakage measurement's timeout (see "Measurement Timeouts") setting to be used when the timeout state is set to ON.
Setting	Range: 0.1 to 999.9 seconds Resolution: 0.1 second
Query	Range: 0.1 to 999.9
*RST Setting	10 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714 ; " SETUP : WACLEAKAGE : TIMEOUT : TIME 5 S "	

SETup:WACLeakage:TRIGger:DELay

Function	Sets/queries the adjacent channel leakage measurement's trigger delay setting. This setting can be used to delay the measurement trigger in order to start a measurement during a specific timeslot in the frame. For example, a 1.333 ms delay would cause the trigger to wait until after the first two timeslots have elapsed.
Setting	Range: -10 to 10 milliseconds Resolution: 0.0001 millisecond
Query	Range: -10 to 10 milliseconds
*RST Setting	0 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714 ; " SETUP : WACLEAKAGE : TRIGGER : DELAY 1MS "	

SETup:WACLeakage:TRIGger:SOURce

Function	Sets/queries the adjacent channel leakage measurement's trigger source.
Setting	Range: IMMEDIATE PROTOcol AUTO
Query	Range: IMM PROT AUTO
*RST Setting	AUTO
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "SETUP:WACLEAKAGE:TRIGGER:SOURCE IMMEDIATE"	

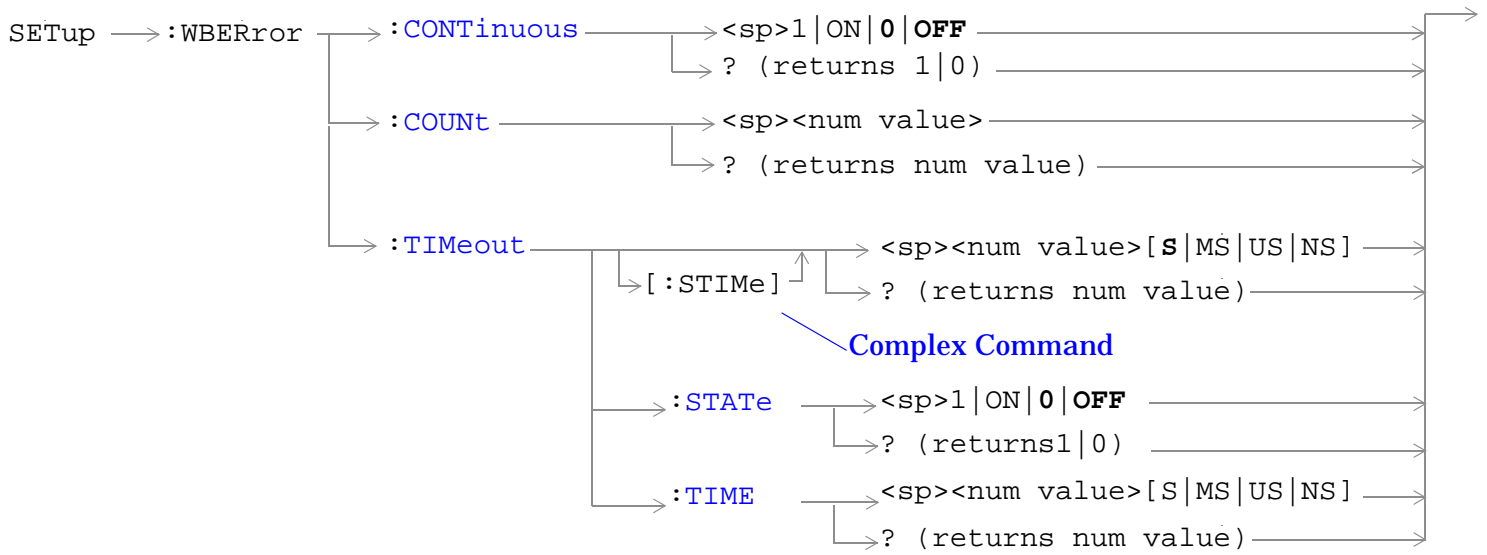
SETup:WACLeakage:UPPer[1]:STATe

Function	Sets/queries the 1st upper adjacent channel's state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "SETUP:WACLEAKAGE:UPP1:STATE 0" !Turns off the upper 1st adjacent channel.	

SETup:WACLeakage:UPPer2:STATe

Function	Sets/queries the 2nd upper adjacent channel's state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714; "SETUP:WACLEAKAGE:UPP2:STATE 0" !Turns off the upper 2nd adjacent channel.	

SETup:WBError



“Diagram Conventions” on page 168

SETup:WBERror:CONTInuous

Function	Sets/queries the trigger arm state for the loopback bit error ratio measurement. The trigger arm state determines whether the bit error measurement will be made once then stop (0 OFF (single)), or automatically re-arm upon completion of one measurement and repeat the process (1 ON (continuous)).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WBERROR:CONTINUOUS ON" !Sets measurement to single trigger mode.</pre>	

SETup:WBERror:COUNT

Function	Sets/queries the number of bits to test in the loopback bit error ratio test.
Setting	Range: 1000 to 999000
Query	Range: 1000 to 999000
*RST Setting	10000
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WBERROR:COUNT 5000"</pre>	

SETup:WBERror:TIMEout[:STIME]

Function	The setting form of this command performs two functions: (1) sets the loopback bit error ratio measurement's timeout (see " Measurement Timeouts ") value, and (2) sets the adjacent channel leakage measurement's timeout STATE to 1 (on). The query form returns the loopback bit error rate measurement's timeout value.
Setting	Range: 0.1 to 999.9 seconds Resolution: 0.1 second
Query	Range: 0.1 to 999.9
*RST Setting	20 seconds, on
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WBERROR:TIMEOUT:STIME 5 S" !Sets timeout state to ON and sets the timeout time to 5 seconds.</pre>	

SETup:WBERRor

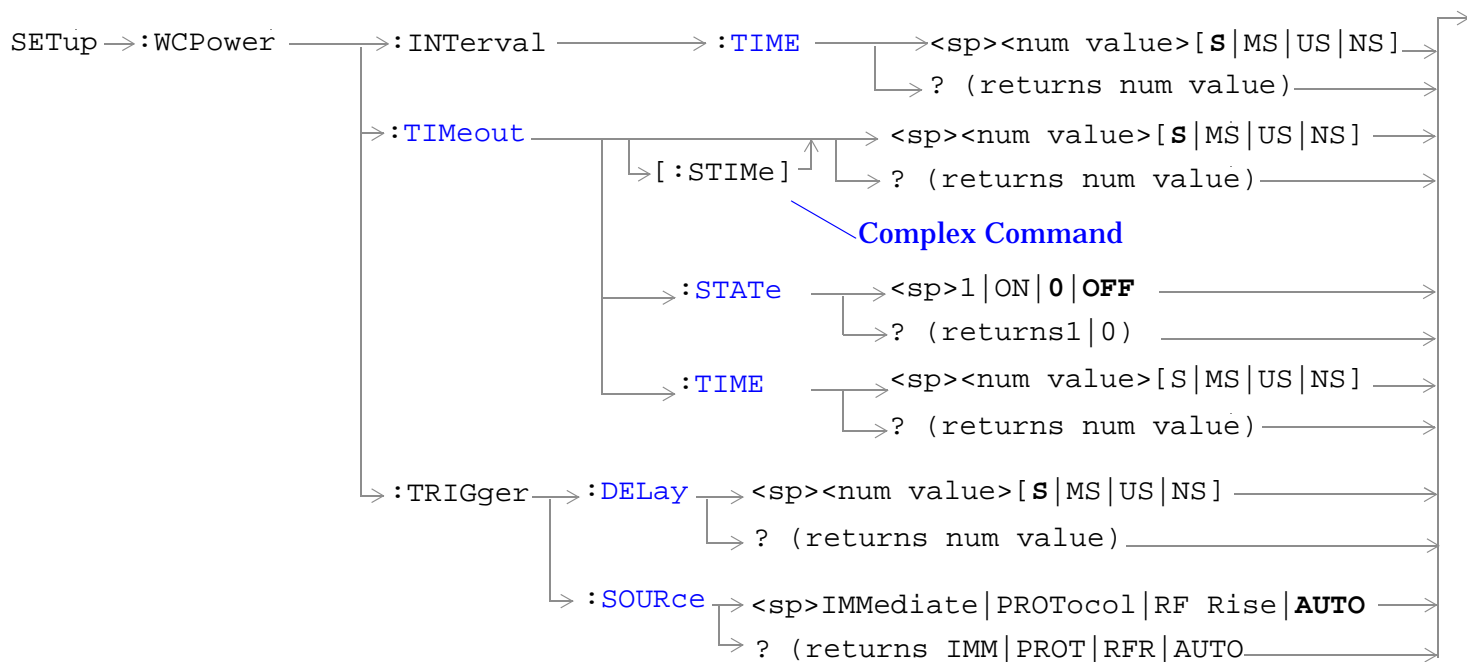
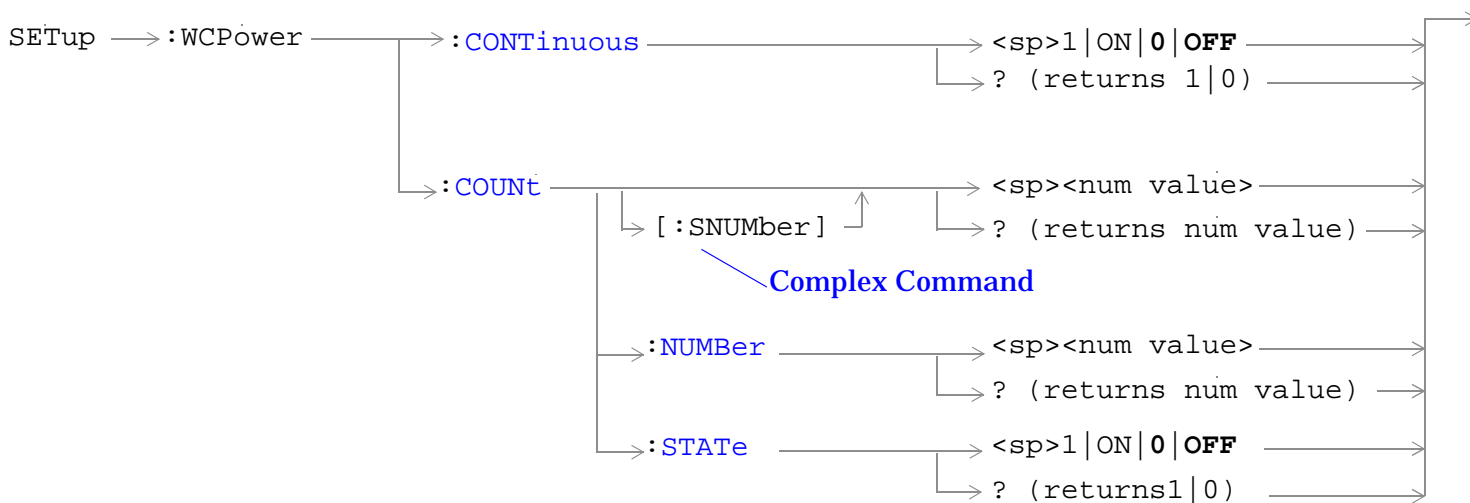
SETup:WBERRor:TIMEout:STATe

Function	Sets/queries the loopback bit error ratio measurement's timeout state (see " Measurement Timeouts ").
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714 ; "SETUP:WBERROR:TIMEOUT:STATE ON"	

SETup:WBERRor:TIMEout:TIME

Function	Sets/queries loopback bit error ratio measurement's timeout setting to be used when the timeout state is set to ON (see " Measurement Timeouts ").
Setting	Range: 0.1 to 999.9 seconds Resolution: 0.1 second
Query	Range: 0.1 to 999.9
*RST Setting	20 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714 ; "SETUP:WBERROR:TIMEOUT:TIME 5 S"	

SETup:WCPower



“Diagram Conventions” on page 168

SETup:WCPower:CONTInuous

Function	Sets/queries the trigger arm state for the channel power measurement. The trigger arm state determines whether the channel power measurement will be made once then stop (0 OFF (single)), or automatically re-arm upon completion of one measurement and repeat the process (1 ON (continuous)).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WCPower:CONTINUOUS OFF" !Sets measurement to single trigger mode.</pre>	

SETup:WCPower:COUNT[:SNUMber]

Function	The setting form of this command performs two functions: (1) sets the number of channel power measurements to be made in a multi-measurement, and (2) sets the multi-measurement STATE command to 1 (on). The query form returns the number of channel power multi-measurements to be made when multi-measurement state is ON.
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	Off (10 when STATE = On)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WCPower:COUNT:SNUMBER 5" !Turns on multi-measurements and sets the number of measurements to 5.</pre>	

SETup:WCPower:COUNT:NUMBer

Function	Sets/queries the number of channel power measurements to be made when the multi-measurement state is ON.
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	10
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WCPower:COUNT:NUMBER 5" !Sets the number of channel power multi-measurements to 5.</pre>	

SETup:WCPower:COUNT:STATE

Function	Sets/queries the channel power multi-measurement state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WCPower:COUNT:STATE ON" !Turns on channel power multi-measurements.</pre>	

SETup:WCPower:INTERVAL:TIME

Function	Sets/queries the channel power measurement interval. 10 milliseconds represents a full frame.
Setting	Range: 0.1 to 10 milliseconds Resolution: 100 nanoseconds (minimum)
Query	Range: 0.01 to 10 milliseconds
*RST Setting	0.6667 ms (one slot interval)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WCPower:INTERVAL:TIME 10MS" !Sets interval time to 10 milliseconds.</pre>	

SETup:WCPower:TIMEout[:STIME]

Function	The setting form of this command performs two functions: (1) sets the channel power measurement's timeout (see " Measurement Timeouts ") value, and (2) sets the channel power measurement's timeout STATE to 1 (on). The query form returns the channel power measurement's timeout value.
Setting	Range: 0.1 to 999.9 seconds Resolution: 0.1 second
Query	Range: 0.1 to 999.9
*RST Setting	10 seconds, on
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WCPower:TIMEOUT:STIME 5 S" !Sets timeout state to ON and sets the timeout time to 5 seconds.</pre>	

SETup:WCPower

SETup:WCPower:TIMEout:STATE

Function	Sets/queries the channel power measurement's timeout (see " Measurement Timeouts ") state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WCPower:TIMEOUT:STATE ON"	

SETup:WCPower:TIMEout:TIME

Function	Sets/queries the channel power measurement's timeout (see " Measurement Timeouts ") setting to be used when the timeout state is set to ON.
Setting	Range: 0.1 to 999.9 seconds Resolution: 0.1 second
Query	Range: 0.1 to 999.9
*RST Setting	10 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WCPower:TIMEOUT:TIME 5 S"	

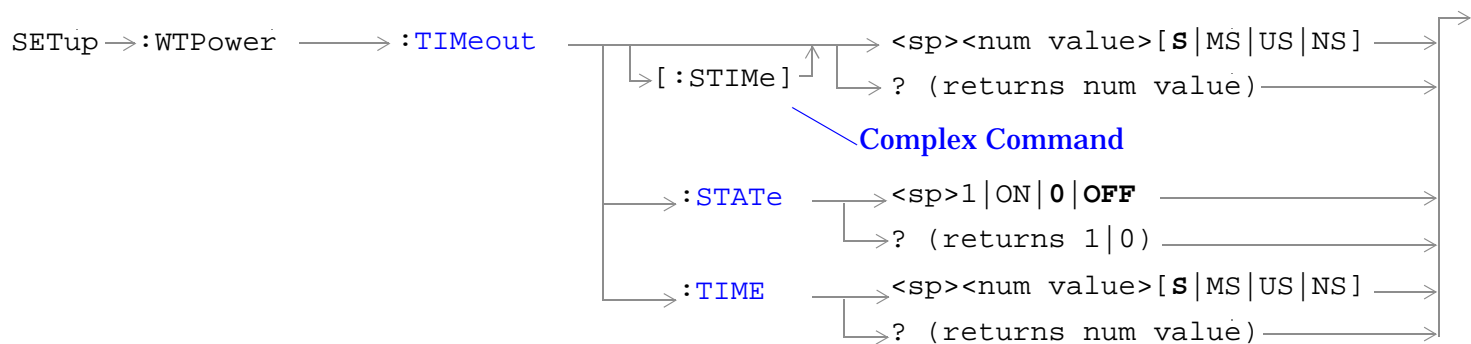
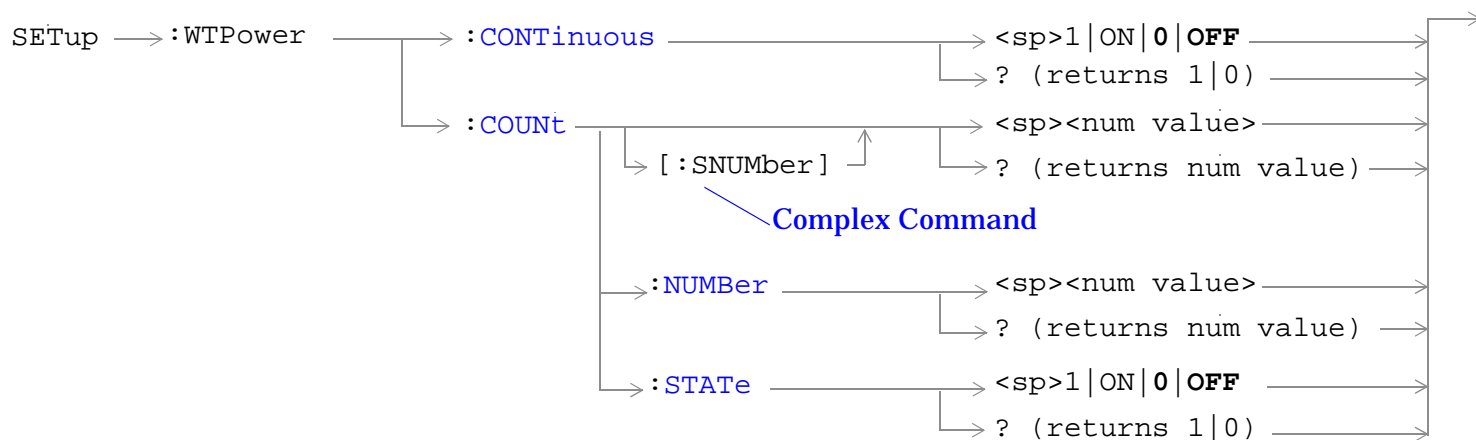
SETup:WCPower:TRIGger:DELay

Function	Sets/queries the channel power measurement's trigger delay setting. This setting can be used to delay the measurement trigger in order to start a measurement during a specific timeslot in the frame. For example, a 1.333 ms delay would cause the trigger to wait until after the first two timeslots have elapsed.
Setting	Range: -10 to 10 milliseconds Resolution: 0.0001 millisecond
Query	Range: -10 to 10 milliseconds
*RST Setting	0 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WCPower:TRIGGER:DELAY 1MS"	

SETup:WCPower:TRIGger:SOURce

Function	Sets/queries the channel power measurement's trigger source.
Setting	Range: IMMEDIATE PROTOCOL RF Rise AUTO
Query	Range: IMM PROT RFR AUTO
*RST Setting	AUTO
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714 ; "SETUP:WCPower:TRIGGER:SOURCE IMMEDIATE"	

SETup:WTPower



[“Diagram Conventions” on page 168](#)

SETup:WTPower:CONTInuous

Function	Sets/queries the trigger arm state for the thermal power measurement. The trigger arm state determines whether the thermal power measurement will be made once then stop (0 OFF (single)), or automatically rearm upon completion of one measurement and repeat the process (1 ON (continuous)).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WTPower:CONTINUOUS ON" !Sets measurement to single trigger mode.</pre>	

SETup:WTPower:COUNT[:SNUMBER]

Function	<p>The setting form of this command performs two functions: (1) sets the number of thermal power measurements to be made in a multi-measurement, and (2) sets the multi-measurement STATE command to 1 (on).</p> <p>The query form returns the number of thermal power multi-measurements to be made when multi-measurement state is ON.</p>
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	Off (10 when STATE = On)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WTPower:COUNT:SNUMBER 5" !Turns on multi-measurements and sets the number of measurements to 5.</pre>	

SETup:WTPower:COUNT:NUMBER

Function	Sets/queries the number of thermal power measurements to be made when the multi-measurement state is ON.
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	10
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WTPower:COUNT:NUMBER 5" !Sets the number of measurements to 5 when the multi-measurement state is set to ON.</pre>	

SETup:WTPower:COUNT:STATE

Function	Sets/queries the multi-measurement state of the thermal power measurement.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WTPower:COUNT:STATE ON" !Turns on multi-measurements.	

SETup:WTPower:TIMEout[:STIME]

Function	The setting form of this command performs two functions: (1) sets the thermal power measurement's timeout value, and (2) sets the thermal power measurement's timeout STATE to 1 (on). The query form returns the channel power measurement's timeout value.
Setting	Range: 1 to 999 seconds Resolution: 1 second
Query	Range: 1 to 999
*RST Setting	10 seconds, on
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WTPower:TIMEOUT:STIME 5S" !Sets timeout state to ON and sets the timeout time to 5 seconds.	

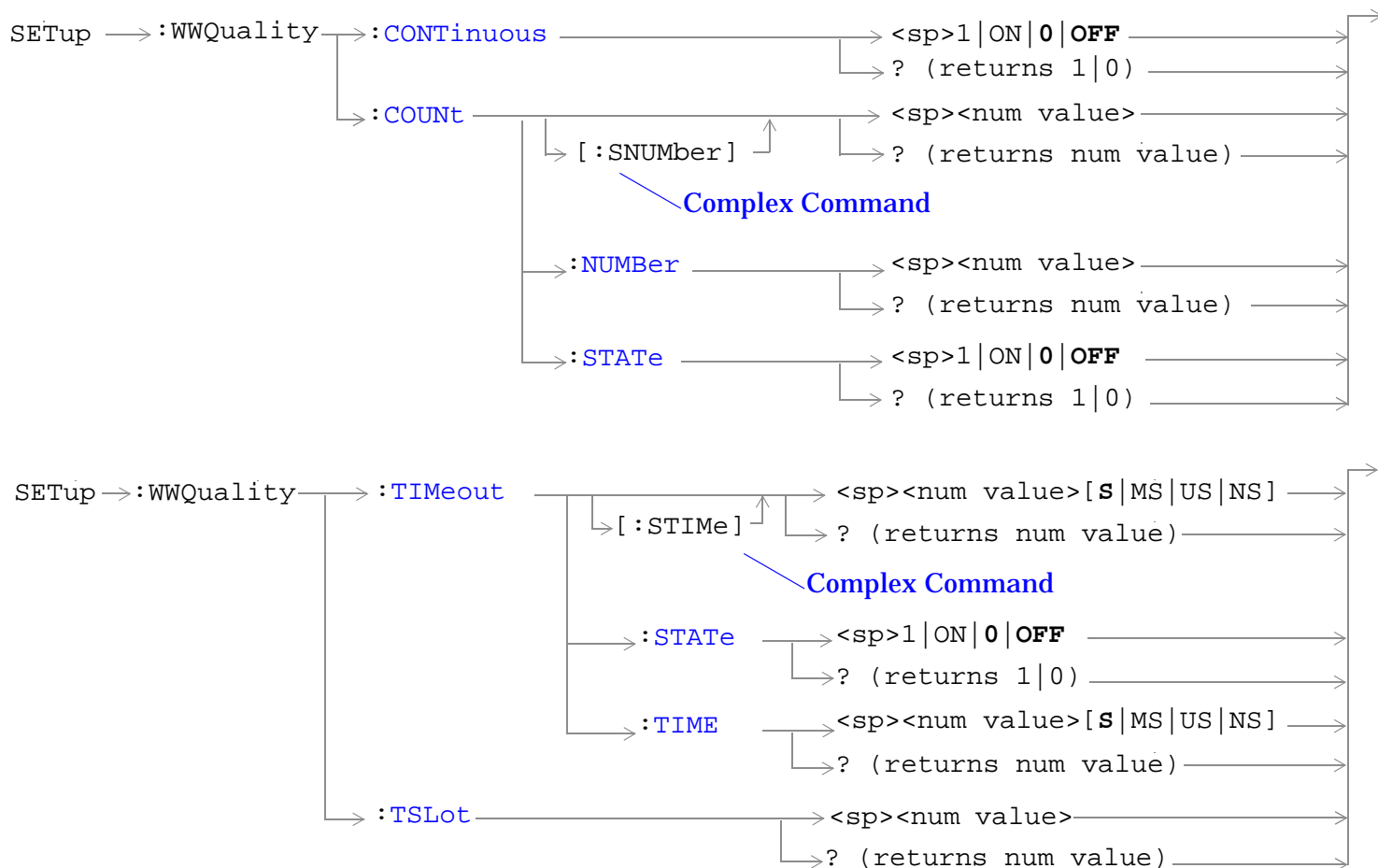
SETup:WTPower:TIMEout:STATE

Function	Sets/queries the thermal power measurement's timeout state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "SETUP:WTPower:TIMEout:STATE ON"	

SETup:WTPower:TIMEout:TIME

Function	Sets/queries the thermal power measurement's timeout setting to be used when the timeout state is set to ON.
Setting	Range: 1 to 999 seconds Resolution: 1 second
Query	Range: 1 to 999
*RST Setting	10 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "SETUP:WTPower:TIMEout:TIME 5S"	

SETup:WWQuality



“Diagram Conventions” on page 168

SETup:WWQuality:CONTinuous

Function	Sets/queries the trigger arm state for the waveform quality measurement. The trigger arm state determines whether the waveform quality measurement will be made once then stop (0 OFF (single)), or automatically rearm upon completion of one measurement and repeat the process (1 ON (continuous)).
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WWQUALITY:CONTINUOUS OFF" !Sets measurement to single trigger mode.</pre>	

SETup:WWQuality:COUNT[:SNUMber]

Function	<p>The setting form of this command performs two functions: (1) sets the number of waveform quality measurements to be made in a multi-measurement, and (2) sets the multi-measurement STATE command to 1 (on).</p> <p>The query form returns the number of waveform quality multi-measurements to be made when multi-measurement state is ON.</p>
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	Off (10 when STATE = On)
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WWQUALITY:COUNT:SNUMBER 5" !Turns on multi-measurements and sets the number of measurements to 5.</pre>	

SETup:WWQuality:COUNT:NUMBer

Function	Sets/queries the number of waveform quality measurements to be made when the multi-measurement state is ON.
Setting	Range: 1 to 999
Query	Range: 1 to 999
*RST Setting	10
Requirements	Test Application Revision: A.02.00 and above
Programming Example <pre>OUTPUT 714;"SETUP:WWQUALITY:COUNT:NUMBER 5" !Sets the number of measurements to 5 when the multi-measurement state is set to ON.</pre>	

SETup:WWQuality:COUNT:STATE

Function	Sets/queries the multi-measurement state of the waveform quality measurement.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WWQUALITY:COUNT:STATE ON" !Turns on multi-measurements.	

SETup:WWQuality:TIMEout[:STIME]

Function	The setting form of this command performs two functions: (1) sets the waveform quality measurement's timeout value, and (2) sets the waveform quality measurement's timeout STATE to 1 (on). The query form returns the waveform quality measurement's timeout value.
Setting	Range: 1 to 999 seconds Resolution: 1 second
Query	Range: 1 to 999
*RST Setting	10 seconds, on
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WWQUALITY:TIMEOUT:STIME 5S" !Sets timeout state to ON and sets the timeout time to 5 seconds.	

SETup:WWQuality:TIMEout:STATE

Function	Sets/queries the waveform quality measurement's timeout state.
Setting	Range: 1 ON 0 OFF
Query	Range: 1 0
*RST Setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WWQUALITY:TIMEOUT:STATE ON"	

SETup:WWQuality:TIMEout:TIME

Function	Sets/queries the waveform quality measurement's timeout setting to be used when the timeout state is set to ON.
Setting	Range: 1 to 999 seconds Resolution: 1 second
Query	Range: 1 to 999
*RST Setting	10 seconds
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WWQUALITY:TIMEOUT:TIME 5S"	

SETup:WWQuality:TSLot

Function	Selects which one of the 15 timeslots found in the frame to make measurements on. The measurement interval is defined to be 1 timeslot long.
Setting	Range: 0 to 16 Resolution: 1
Query	Range: 0 to 14
*RST Setting	1
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SETUP:WWQUALITY:TSLot 10"	

STATus Subsystem

Description

The STATus subsystem is used to communicate current test set status information to the controlling application program.

Syntax Diagrams and Command Descriptions

- [“STATus:OPERation:” on page 318](#)
- [“STATus:PRESet” on page 343](#)
- [“STATus:QUEStionable” on page 344](#)
- [“Status Byte Register” on page 375](#)
- [“Standard Event Status Register” on page 376](#)

Status Register Bit Definitions

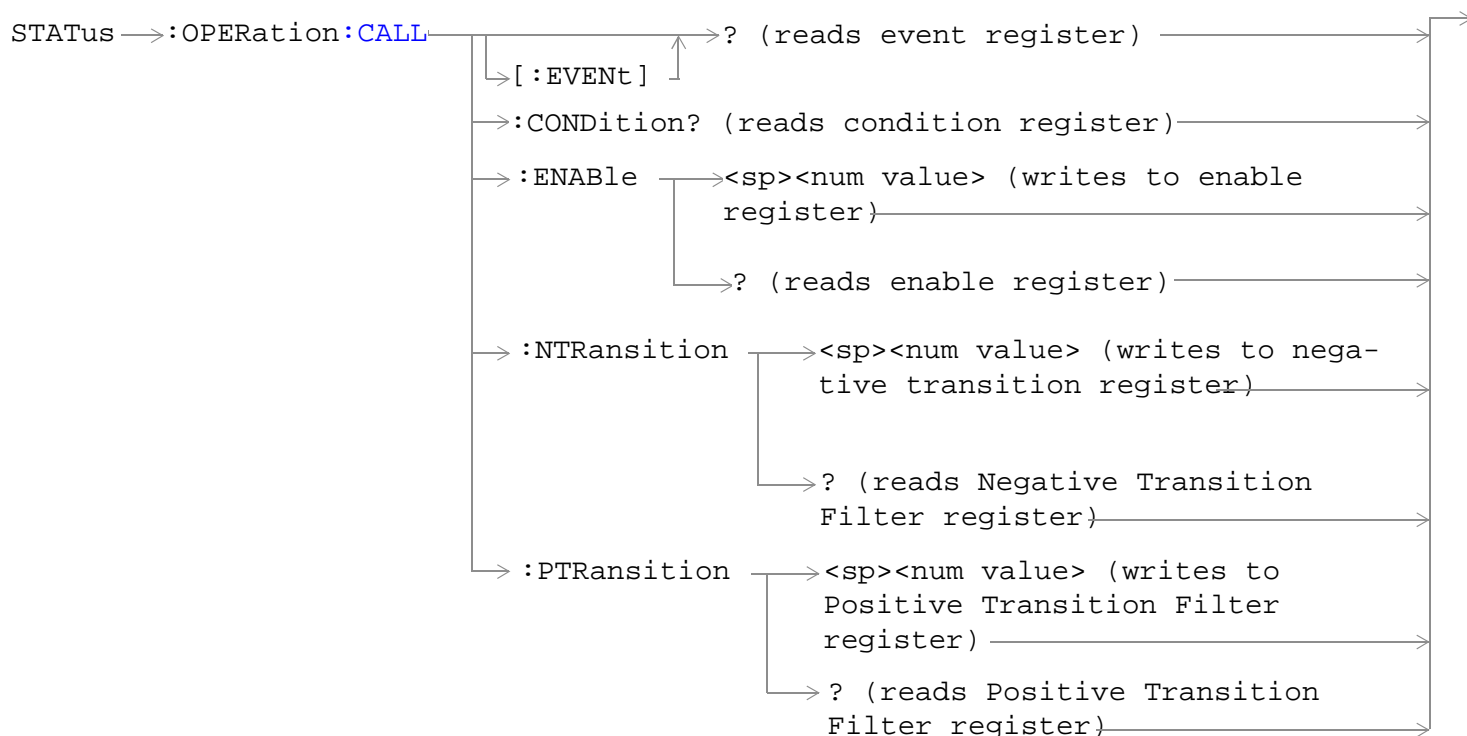
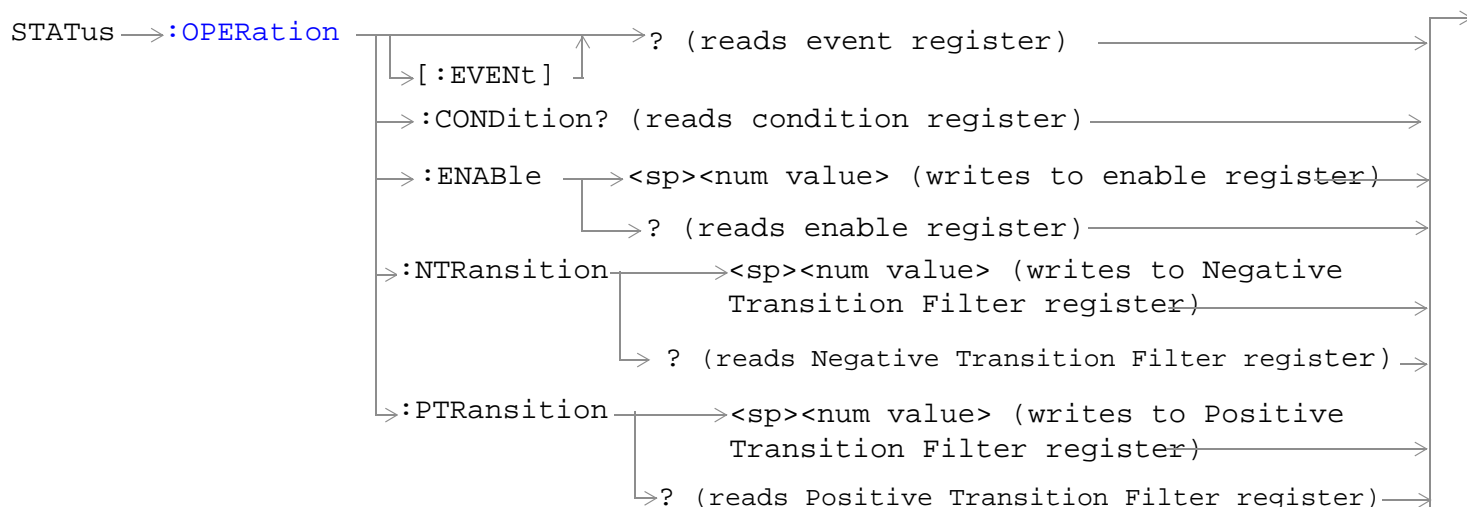
- [“Status Byte Register Bit Assignments” on page 375](#)
- [“Standard Event Status Register Bit Assignment” on page 377](#)
- [“STATus:QUEStionable Condition Register Bit Assignment” on page 351](#)
 - [“STATus:QUEStionable:CALL Condition Register Bit Assignment” on page 352](#)
 - [“STATus:QUEStionable:CALL:CDMA Condition Register Bit Assignment” on page 354](#)
 - [“STATus:QUEStionable:ERRors:COMMon Register Bit Assignments” on page 362](#)
 - [“STATus:QUEStionable:ERRors Condition Register Bit Assignment” on page 356](#)
 - [“STATus:QUEStionable:ERRors:AMPS Condition Register Bit Assignment” on page 358](#)
 - [“STATus:QUEStionable:ERRors:CDMA Register Bit Assignments” on page 360](#)
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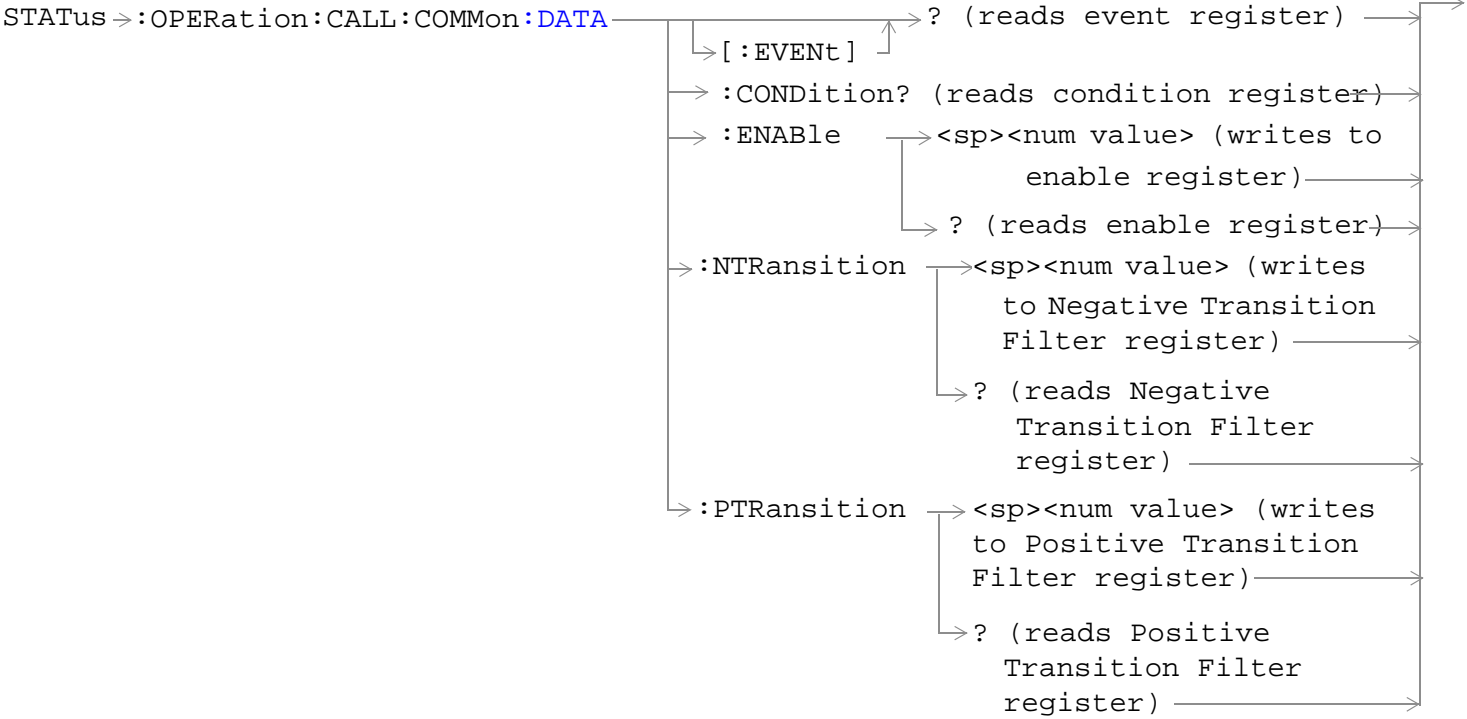
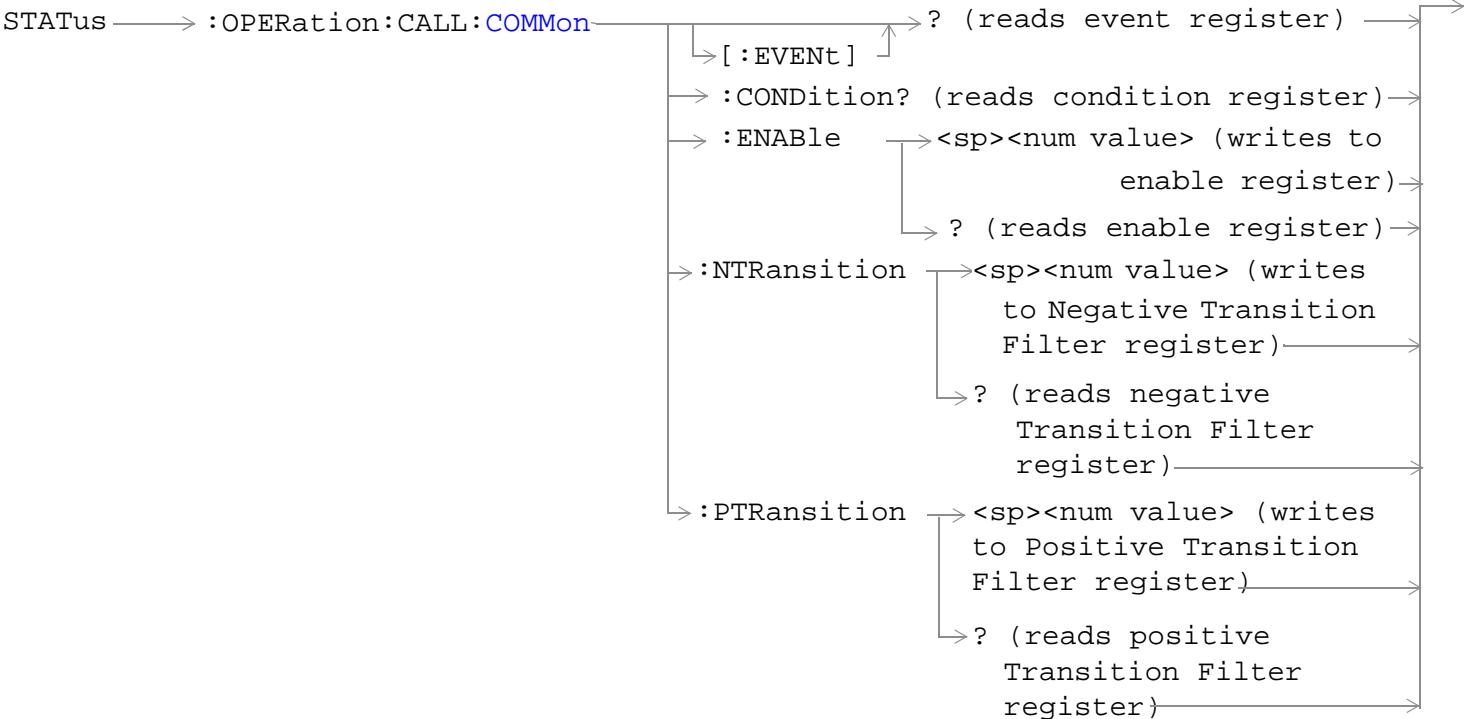
- “STATus:OPERation:NMRReady Register Bit Assignments” on page 334
- “STATus:OPERation:NMRReady:AMPS Condition Register Bit Assignment” on page 336
- “STATus:OPERation:NMRReady:CDMA Register Bit Assignments” on page 337
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- “STATus:OPERation:NMRReady:<WCDMA | FDD> Register Bit Assignments” on page 341

Related Topics

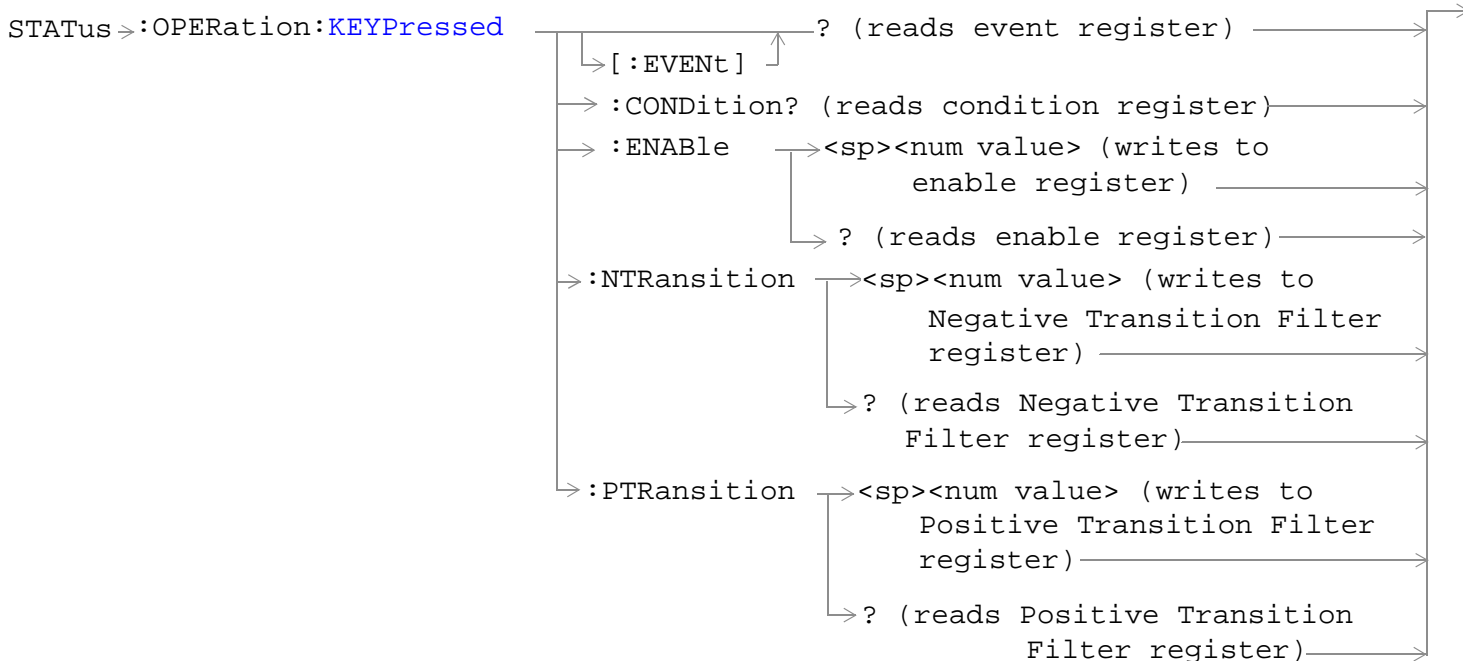
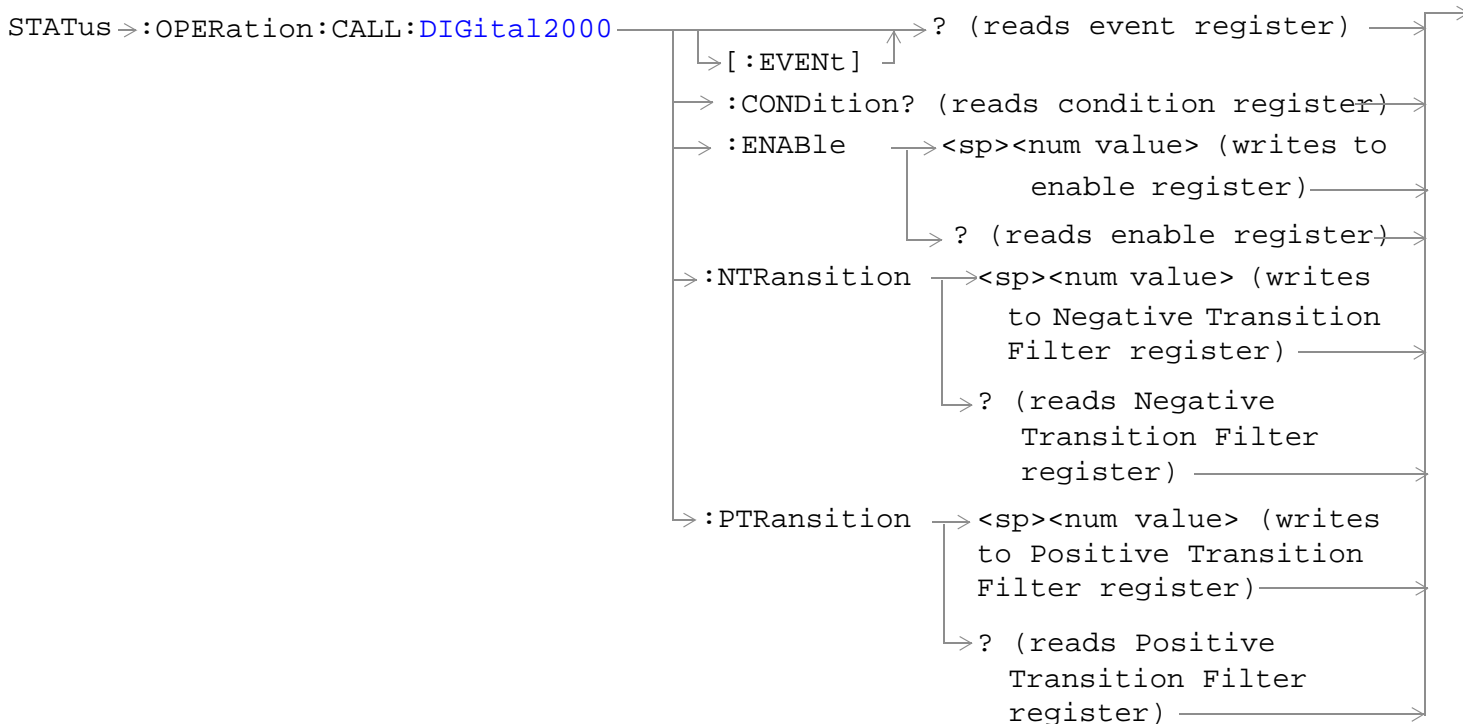
“Status Subsystem Overview” on page 122

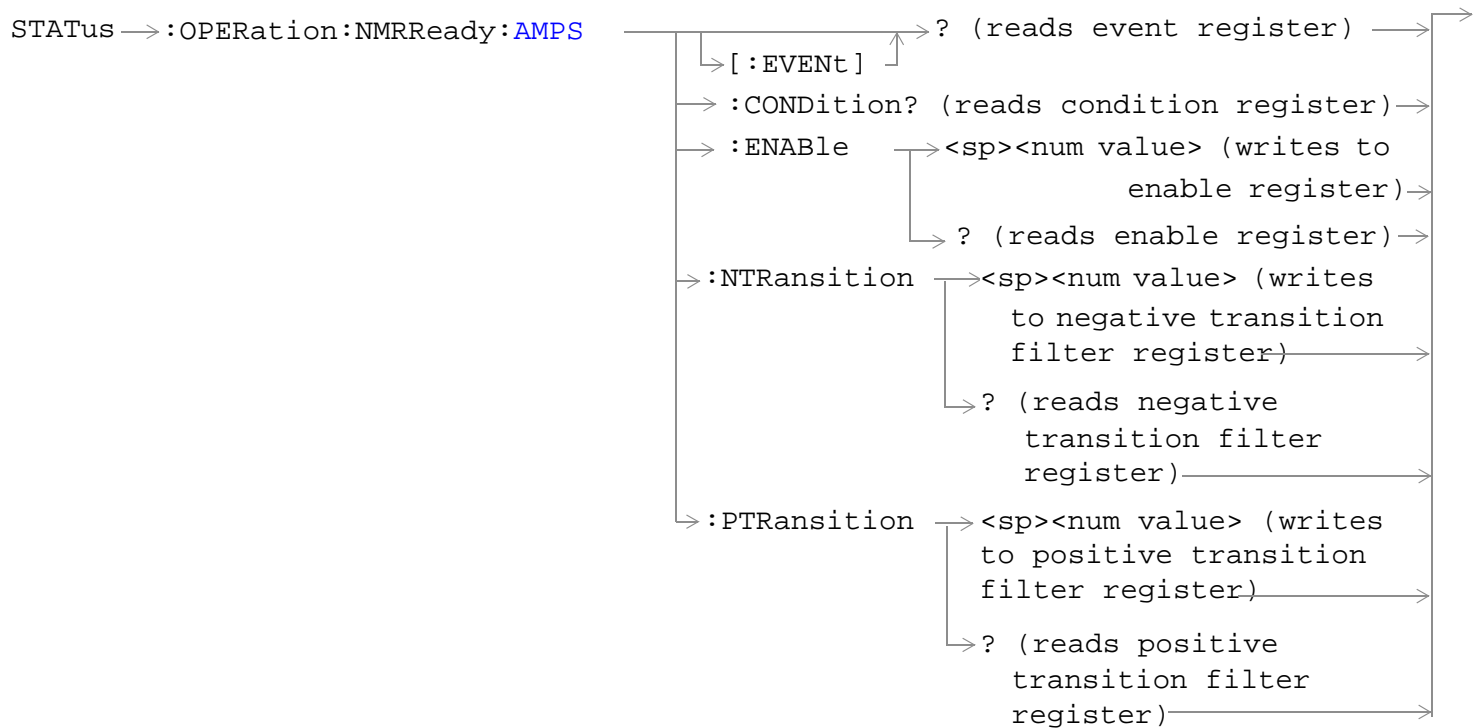
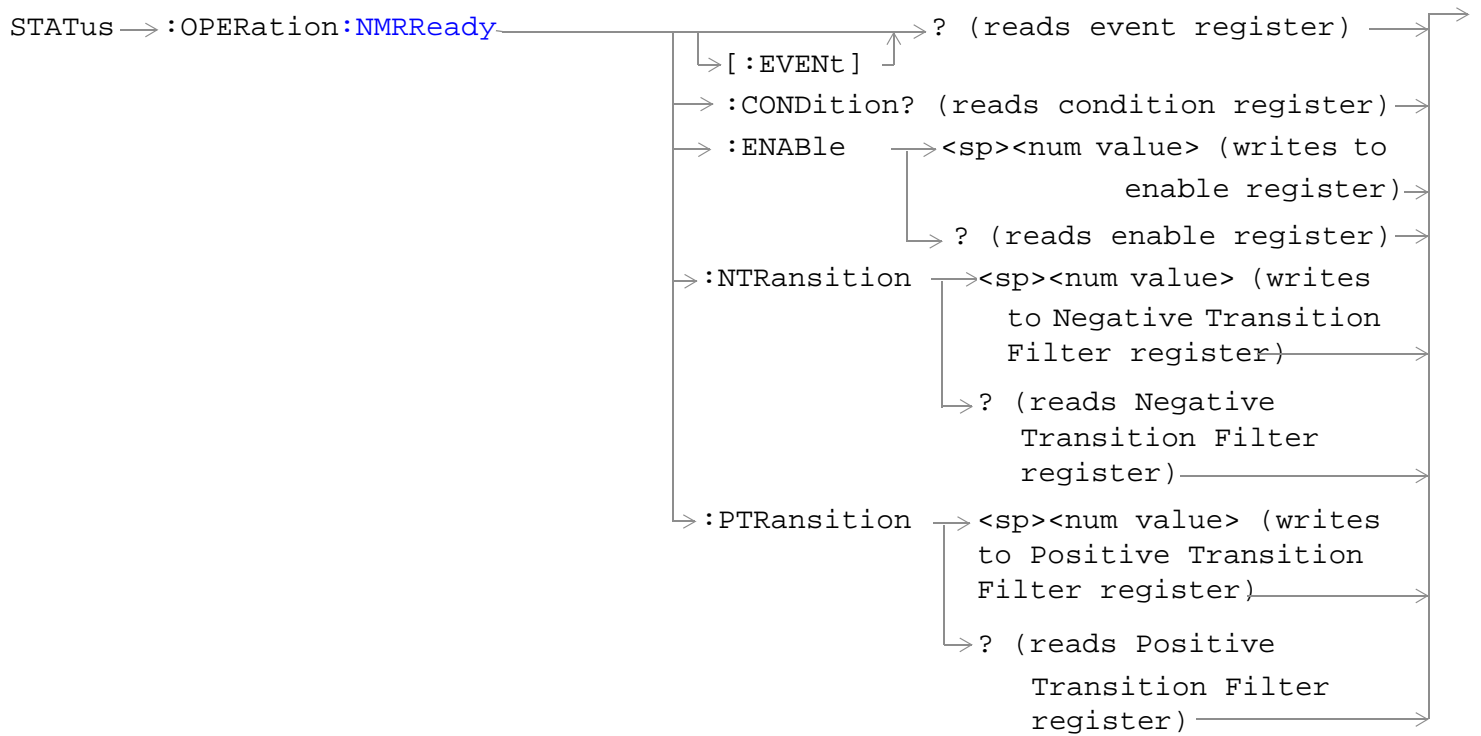
STATUS:OPERation:



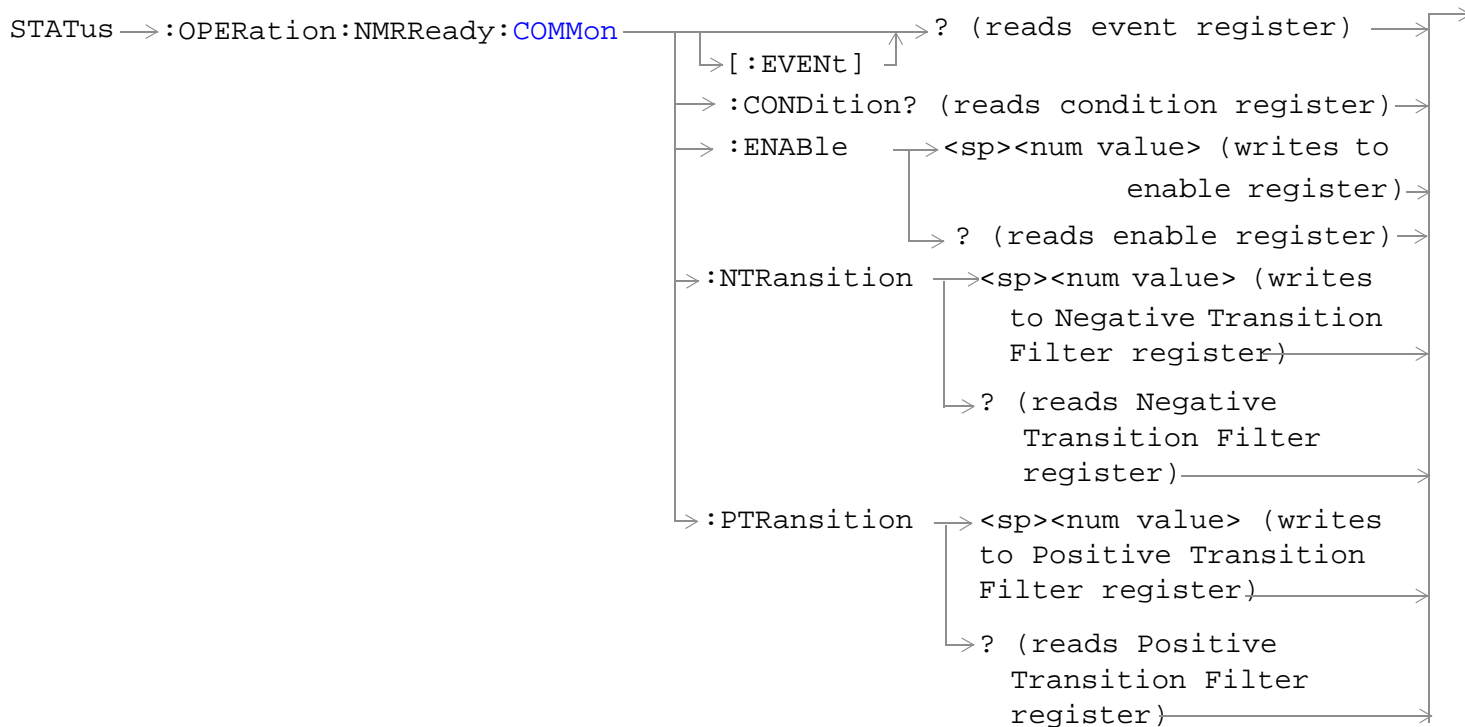
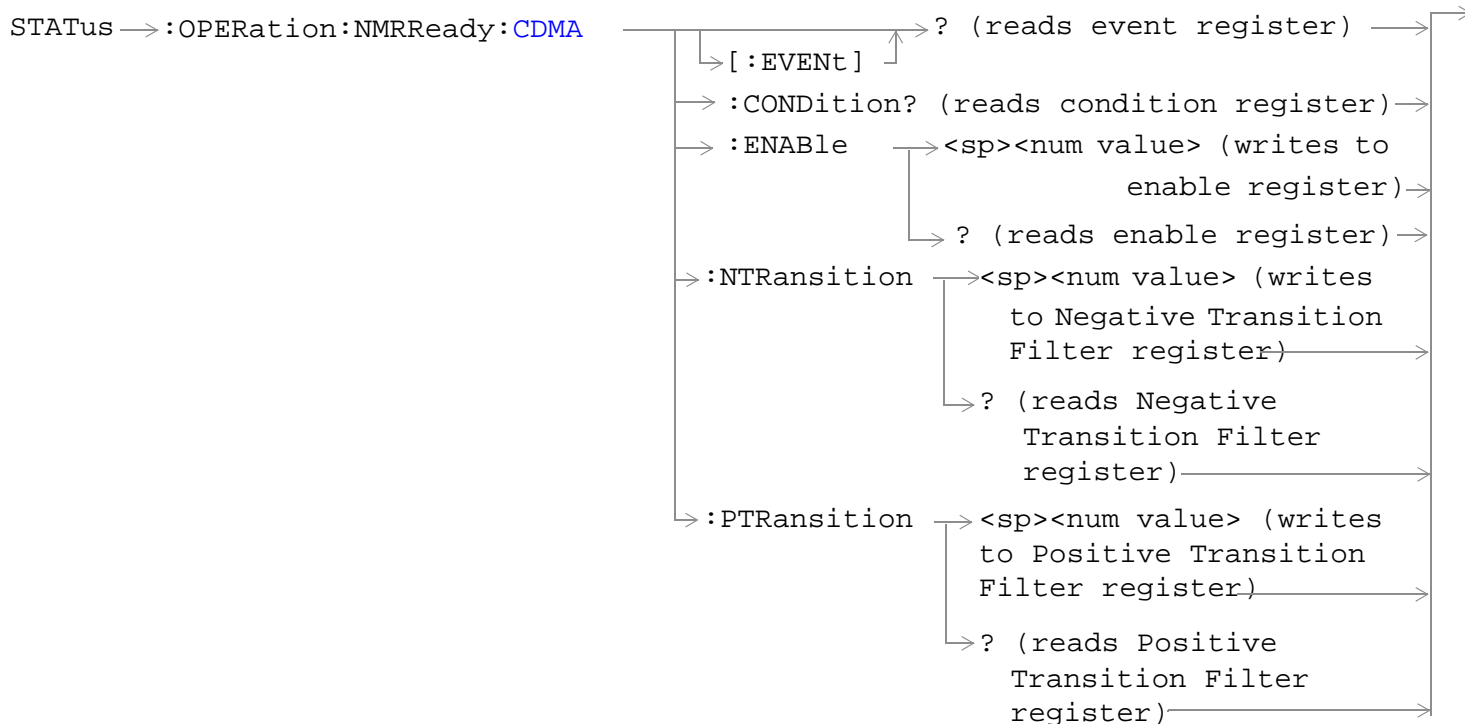


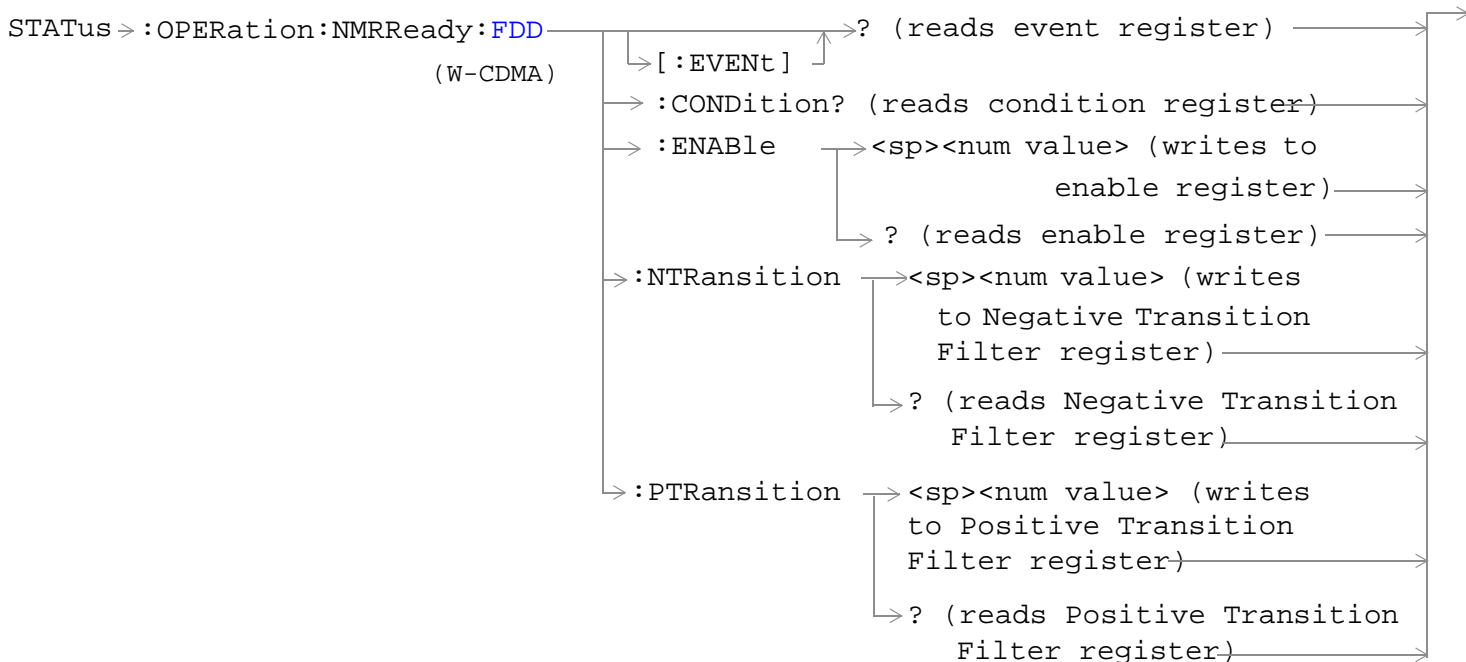
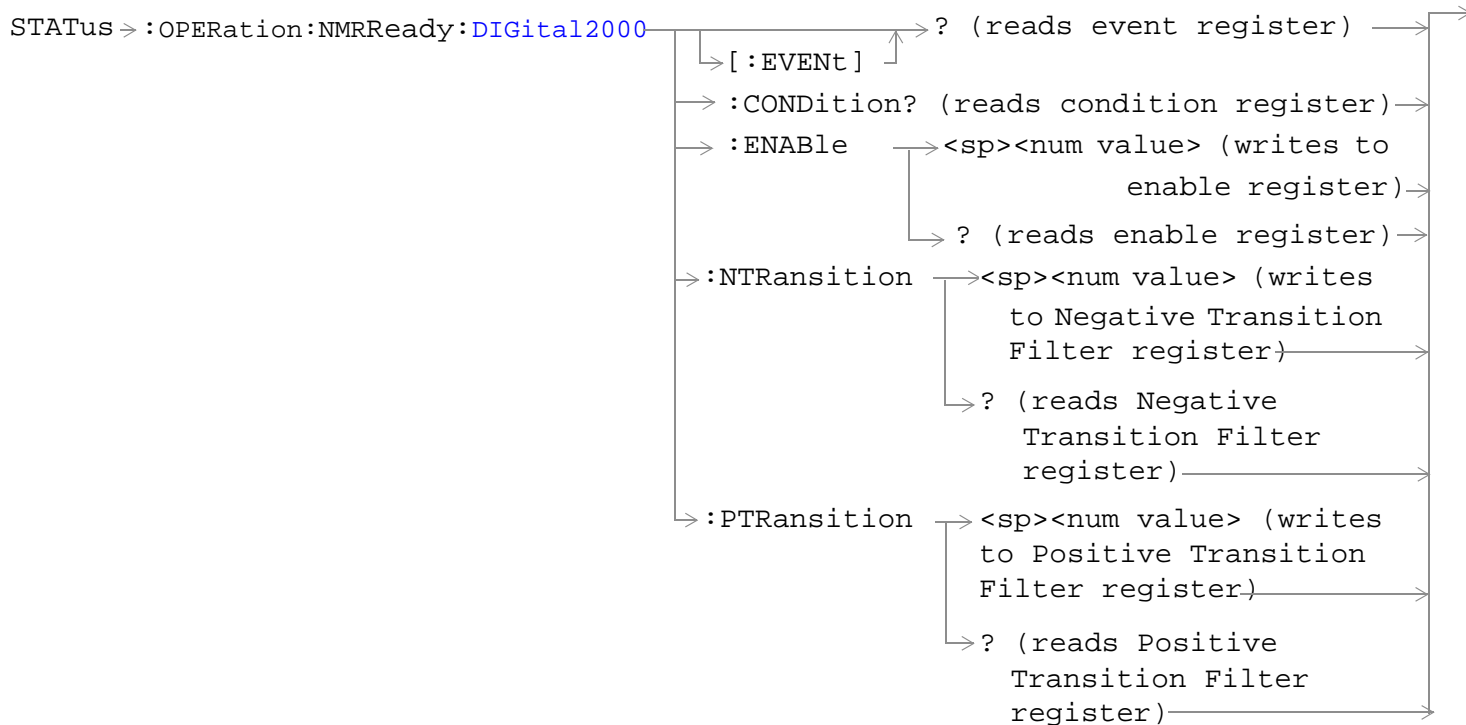
STATUS:OPERation:



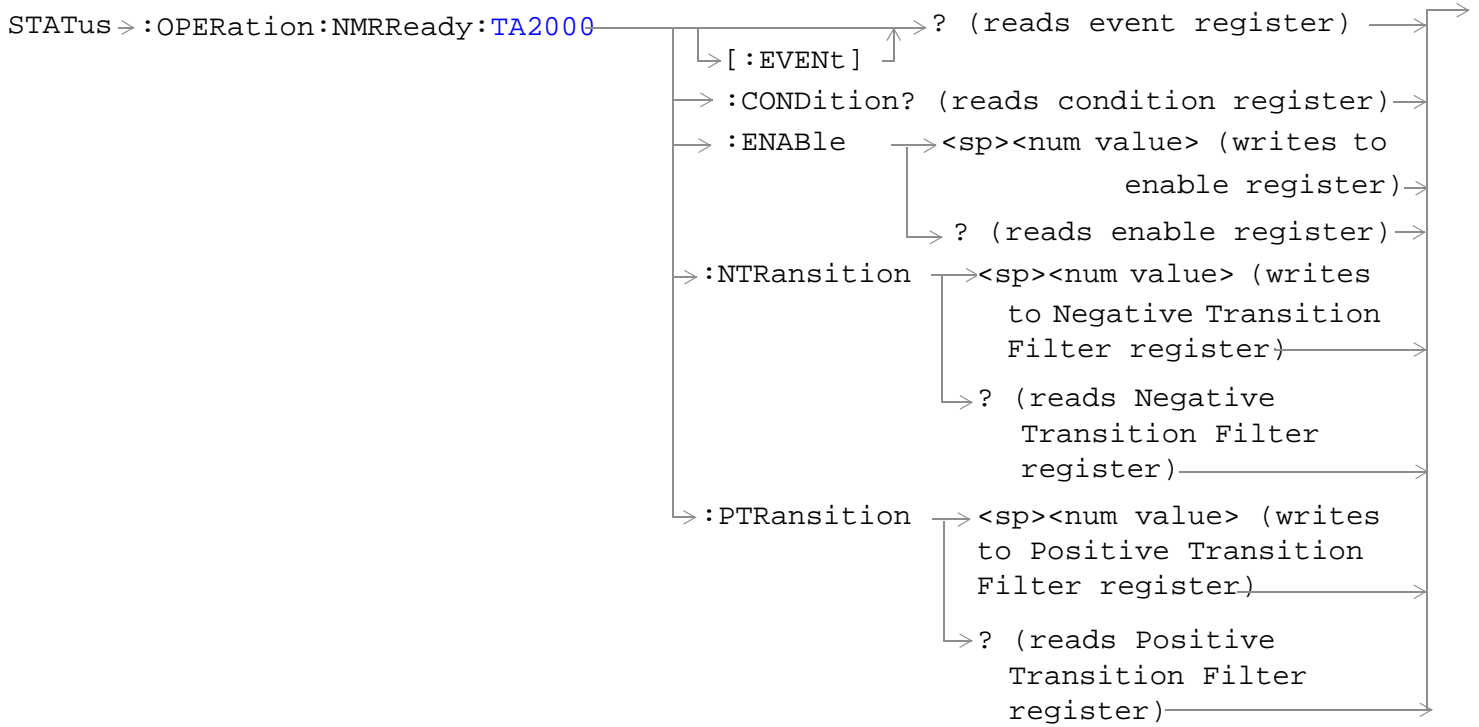


STATUS:OPERation:





STATUS:OPERation:



[“Diagram Conventions” on page 168](#)

STATUS:OPERation Register Bit Assignments

The OPERation status register set contains bits which give an indication of conditions that are part of the test set's normal operation.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	SYSTEM:SYNChronized	This condition bit is "pulsed" by the SYSTEM:SYNChronized command. This will allow the status system to indicate that the input buffer is synchronized to the point where this command is parsed and that all prior sequential commands are completed and all prior overlapped commands have started.
11	2048	Reserved for future use	This bit is always 0.
10	1024	CALL Summary	This bit is the summary message bit for the STATUS:OPERation:CALL register.
9	512	NMRReady (New Measurement Result Ready) Summary	This bit is the summary message bit for the STATUS:OPERation:NMRReady register.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	Reserved for future use.	This bit is always 0.
3	8	Reserved for future use.	This bit is always 0.
2	4	Reserved for future use.	This bit is always 0.
1	2	Reserved for future use.	This bit is always 0.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATUS:OPERation

```

OUTPUT 714;"STATUS:OPERATION:EVENT?" !Queries the Operation Event Register.
OUTPUT 714;"STATUS:OPERATION:CONDITION?" !Queries the Operation Condition Register.
OUTPUT 714;"STATUS:OPERATION:ENABLE 1024" !Sets the Operation Enable Register for bit 10.
OUTPUT 714;"STATUS:OPERATION:NTR 1024" !Sets the Operation Negative Transition
!Register for bit 10.
OUTPUT 714;"STATUS:OPERATION:PTR 512" !Sets the Operation Event Positive Transition
!Register for bit 9.

```

STATUS:OPERation:

STATUS:OPERation:CALL Condition Register Bit Assignment

The STATUS:OPERation:CALL register bits will be used to indicate status of processes that occur during normal call processing operations.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	TA2000 Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:DIGITAL136 register.
3	8	AMPS Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:AMPS register.
2	4	GSM Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:GSM register.
1	2	COMMOon Summary bit	This bit is the summary message bit for the STATUS:OPERation:CALL:COMMOon register.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATUS:OPERation:CALL

```
OUTPUT 714;"STATUS:OPERATION:CALL:EVENT?" !Queries the Operation Call Event !Register.
OUTPUT 714;"STATUS:OPERATION:CALL:CONDITION?" !Queries the Operation Call Condition Register.
OUTPUT 714;"STATUS:OPERATION:CALL:ENABLE 4"
!Sets the Operation Call Enable Register for bit 2.
OUTPUT 714;"STATUS:OPERATION:CALL:NTR 4" !Sets the Negative Transition Register for bit 2.
OUTPUT 714;"STATUS:OPERATION:CALL:PTR 256" !Sets the Positive Transition Register for bit 8.
```

STATUS:OPERation:CALL:COMMON Condition Register Bit Assignment

The STATUS:OPERation:CALL:COMMON register bits will be used to indicate status of processes that occur during normal call processing operations.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Data Summary	This bit is the summary message bit for the STATUS:QUESTIONable:CALL:GSM:DATA register.
13	8192	Call Control Status Access Probe	This bit is a 1 when the test set is in the call control status access probe state.
12	4096	Call Control Status Set Up Request	This bit is a 1 when the test set is in the call control status set up request state.
11	2048	Call Control Status Releasing	This bit is a 1 when the test set is in the call control status releasing state.
10	1024	Call Control Status Paging	This bit is a 1 when the test set is in the call control status paging state.
9	512	Registering (BS initiated)	This bit is set to a 1 when the Base Station initiates registration.
8	256	Reserved for future use.	This bit is always 0.
7	128	BS Originating	This bit is a 1 when: <ul style="list-style-type: none"> Active Cell mode - the call processing state leaves the idle state Test mode - the test set has noted a base station origination.
6	64	Call Control Status Changing	This bit is a 1 when the test set is in the call control status changing state.
5	32	Call Control Status Handover/Handoff	This bit is a 1 when the test set is in the call control handover or handoff state.
4	16	Call Control Status Registering	This bit will be a 1 when the test set is in the call control status registering state.
3	8	Call Control Status is "Alerting"	This bit is a 1 when the test set is in the call alerting state (ringing).
2	4	Call Control Status is "Connected"	This bit is a 1 when the test set is in the call connected state.
1	2	Call Control Status is "Idle"	This bit is a 1 when the test set is in the call idle state.
0	1	Extension Bit	This bit is always 0.

STATUS:OPERation:

Program Examples - STATUS:OPERation:CALL:COMMON

```
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:EVENT?" !Queries the Operation Call Common Event
          !Register.
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:CONDITION?" !Queries the Operation Call Common
          !Condition Register.
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:ENABLE 8" !Sets the Operation Call Common Enable
          !Register for bit 3.
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:NTR 8" !Sets the Negative Transition
          !Register for bit 3.
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:PTR 256" !Sets the Positive Transition
          !Register for bit 8.
```


STATUS:OPERation:CALL:COMMON:DATA Condition Register Bit Assignment

The STATUS:OPERation:CALL:COMMON:DATA register bits are used to indicate status of processes that occur during normal data connection processing operations.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Starting Data Connection	This bit is a 1 when: <ul style="list-style-type: none"> Active Cell mode - the data connection status leaves the idle state Test mode - the test set has noted a base station origination.
6	64	Data Connection Status Changing	This bit is set to a 1 when the data connection status change detector has been armed.
5	32	Data Connection Status Off	This bit is set to 1 when the test set is in the call control status handover/handoff state.
4	16	Data Connection Status Data Connected	This bit is set to 1 when data connection status data is in the connected state.
3	8	Data Connection Status Transferring	This bit is set to 1 when the data connection status is Transferring.
2	4	Data Connection Status Attached	This bit is set to 1 when the data connection status is Attached.
1	2	Data Connection Status Idle	This bit is set to 1 when the data connection status is Idle.
0	1	Extension Bit	This bit will always be 0.

STATUS:OPERation:

Program Examples STATUS:OPERation:CALL:COMMON:DATA

```
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:DATA:EVENT?" !Queries and clears the Operation
!Call Common Data Event Register
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:DATA:CONDITION?" !Queries and clears the Operation
!Call Common Data Condition
!Register
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:DATA:ENABLE 128" !Sets the Operation Call Common
!Data Enable Register for bit 7
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:NTRANSITION 2" !Sets the Operation Call Common
!Data Negative Transition Filter
!Register for bit 1
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:PTRANSITION 2" !Set the Operation Call Common
!Data Positive Transition Filter
!Register for bit 1
```

STATUS:OPERation:CALL:DIGital2000 Register Bit Assignment

The STATUS:OPERation:CALL:DIGital2000 register bits will be used to indicate status of processes that occur during DIGital2000 call processing operations.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	Reserved for future use.	This bit is always 0.
3	8	Reserved for future use.	This bit is always 0.
2	4	Reserved for future use.	This bit is always 0.
1	2	F-SCH Synchronized.	1 indicates that a 10.24 second sync frame boundary has been encountered and a valid TDSO FER measurement can now be initiated.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATUS:OPERation:CALL

```

OUTPUT 714;"STATUS:OPERATION:CALL:DIGITAL2000:EVENT?"
    !Queries the Operation Call DIGital2000 Event Register.
OUTPUT 714;"STATUS:OPERATION:CALL:DIGITAL2000:CONDITION?"
    !Queries the Operation Call DIGital2000Condition Register.
OUTPUT 714;"STATUS:OPERATION:CALL:DIGITAL2000:ENABLE 2"
    !Sets the Operation Call DIGital2000Enable Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:CALL:DIGITAL2000:NTR 4"
    !Sets the DIGital2000 Negative Transition Register for bit 2.
OUTPUT 714;"STATUS:OPERATION:CALL:DIGITAL2000:PTR 256"
    !Sets the DIGital2000 Positive Transition Register for bit 8.

```

STATUS:OPERation:

STATUS:OPERation:KEYPressed Register Bit Assignments

The STATUS:OPERation:KEYPressed register bits indicate when a softkey on the test set's front panel has been pressed while the test set is in remote operating mode.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	F12 softkey	This bit is a 1 when the test set's F12 softkey has been pressed.
10	1024	F11 softkey	This bit is a 1 when the test set's F11 softkey has been pressed.
9	512	F10 softkey	This bit is a 1 when the test set's F10 softkey has been pressed.
8	256	F9 softkey	This bit is a 1 when the test set's F9 softkey has been pressed.
7	128	F8 softkey	This bit is a 1 when the test set's F8 softkey has been pressed.
6	64	F7 softkey	This bit is a 1 when the test set's F7 softkey has been pressed.
5	32	F6 softkey	This bit is a 1 when the test set's F6 softkey has been pressed.
4	16	F5 softkey	This bit is a 1 when the test set's F5 softkey has been pressed.
3	8	F4 softkey	This bit is a 1 when the test set's F4 softkey has been pressed.
2	4	F3 softkey	This bit is a 1 when the test set's F3 softkey has been pressed.
1	2	F2 softkey	This bit is a 1 when the test set's F2 softkey has been pressed.
0	1	F1 softkey	This bit is a 1 when the test set's F1 softkey has been pressed.

Program Examples - STATus:OPERation:KEYPressed

```
OUTPUT 714;"STATUS:OPERATION:KEYPRESSED:EVENT?"
!Queries the Keypressed Event Register.
OUTPUT 714;"STATUS:OPERATION:KEYPRESSED:CONDITION?"
!Queries the Keypressed Condition Register.
OUTPUT 714;"STATUS:OPERATION:KEYPRESSED:ENABLE 16"
!Sets Keypressed Enable register for bit 4.
OUTPUT 714;"STATUS:OPERATION:KEYPRESSED:NTR 2"
!Sets the Keypressed Negative Transition Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:KEYPRESSED:PTR 4"
!Sets the Keypressed Positive Transition Register for bit 2
```

STATUS:OPERation:

STATUS:OPERation:NMRReady Register Bit Assignments

The STATUS:OPERation:NMRReady register bits indicate when a measurement has been completed and new measurement results are available.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	TA2000 Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:TA136 register.
4	16	DIGITAL136 Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:DIGITAL136 register.
3	8	AMPS Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:AMPS register.
2	4	GSM Summary bit	STATUS:This bit is the summary message bit for the OPERATION:NMRReady:GSM register.
1	2	COMMON Summary bit	This bit is the summary message bit for the STATUS:OPERation:NMRReady:COMMON register.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATUS:OPERation:NMRReady

```
OUTPUT 714;"STATUS:OPERATION:NMRREADY:EVENT?" !Queries the New Measurement
!Results Ready Event Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:CONDITION?" !Queries the New Measurement
!Results Ready
!Condition Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:ENABLE 16" !Sets New Measurement Results
!Ready Enable Register
!for bit 4.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:NTR 2" !Sets the New Measurement Results
!Ready Negative Transition
!Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:PTR 4" !Sets the New Measurement
!Results Ready Positive
!Transition Register
!for bit 2
```

STATUS:OPERation:

STATUS:OPERation:NMRReady:AMPS Condition Register Bit Assignment

The STATUS:OPERation:NMRReady:AMPS register bits indicate when a measurement has been completed and new measurement results are available.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	Reserved for future use.	This bit is always 0.
3	8	FM New Measurement Result Ready	This is a 1 if the measurement has been completed and has produced new results.
2	4	FSTAbility New Measurement Result Ready	This is a 1 if the measurement has been completed and has produced new results.
1	2	ATXPower New Measurement Result Ready	This is a 1 if the measurement has been completed and has produced new results.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATUS:OPERation:NMRReady:AMPS

```
OUTPUT 714;"STATUS:OPERATION:NMRREADY:AMPS:EVENT?" !Queries the New Measurement
!Results Ready AMPS Event Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:AMPS:CONDITION?" !Queries the New Measurement
!Results Ready AMPS Condition Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:AMPS:ENABLE 8" !Sets New Measurement Results
!Ready AMPS Enable Register for bit 3.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:AMPS:NTR 2" !Sets the New Measurement Results
!Ready AMPS Negative Transition
!Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:AMPS:PTR 4" !Sets the New Measurement
!Results Ready AMPS Positive
!Transition Register for bit 2
```


STATUS:OPERation:NMRReady:CDMA Register Bit Assignments

The STATUS:OPERation:NMRReady:CDMA register bits indicate when a measurement has been completed and new measurement results are available.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	CTXSpurious New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
7	128	GPOwer New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
6	64	TROPower New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
5	32	CAPPower New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
4	16	CFERror New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.

STATUS:OPERation:

Bit Number	Binary Weighting	Condition	Description
3	8	CPOWer New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See "Triggering of Measurements" on page 148.
2	4	WQQuality New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See "Triggering of Measurements" on page 148.
1	2	DAPower New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See "Triggering of Measurements" on page 148.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATUS:OPERation:NMRReady:CDMA

```

OUTPUT 714;"STATUS:OPERATION:NMRREADY:CDMA:EVENT?" !Queries the New Measurement
                !Results Ready CDMA Event Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:CDMA:CONDITION?" !Queries the New Measurement
                !Results Ready CDMA
                !Condition Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:CDMA:ENABLE 8" !Sets New Measurement Results
                !Ready CDMA Enable Register
                !for bit 3.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:CDMA:NTR 2" !Sets the New Measurement Results
                !Ready CDMA Negative Transition
                !Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:CDMA:PTR 4" !Sets the New Measurement
                !Results Ready CDMA Positive
                !Transition Register
                !for bit 2

```

STATUS:OPERation:NMRReady:COMMON Register Bit Assignments

The STATUS:OPERation:NMRReady:COMMON register bits indicate when a measurement has been completed and new measurement results are available.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	Reserved for future use.	This bit is always 0.
3	8	Reserved for future use.	This bit is always 0.
2	4	Reserved for future use.	This bit is always 0.
1	2	Audio Analyzer	This is the summary message bit for the STATUS:OPERation:NMRReady:COMMON Audio Analyzer register.
0	1	Extension Bit	This bit is always 0.

STATUS:OPERation:

Program Examples - STATUS:OPERation:NMRReady:COMMON

```
OUTPUT 714;"STATUS:OPERATION:NMRREADY:COMMON:EVENT?" !Queries the New Measurement
           !Results Ready Common Event Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:COMMON:CONDITION?" !Queries the New Measurement
           !Results Ready Common
           !Condition Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:COMMON:ENABLE 2" !Sets New Measurement Results
           !Ready Common Enable Register
           !for bit 1.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:COMMON:NTR 2" !Sets the New Measurement Results
           !Ready Common Negative Transition
           !Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:COMMON:PTR 2" !Sets the New Measurement
           !Results Ready Common Positive
           !Transition Register
           !for bit 1
```

STATUS:OPERation:NMRReady:<WCDMA | FDD> Register Bit Assignments

The STATUS:OPERation:NMRReady:FDD register bits indicate when a measurement has been completed and new measurement results are available.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	WBError New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
4	16	WCPower New Measurement Result Ready	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
3	8	WWQuality New Measurement Result Ready.	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.
2	4	WACLeakage New Measurement Result Ready.	This bit is a 1 if the measurement has been completed and has produced new results. This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.

STATUS:OPERation:

Bit Number	Binary Weighting	Condition	Description
1	2	WTPower New Measurement Result Ready.	<p>This bit is a 1 if the measurement has been completed and has produced new results.</p> <p>This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.</p>
0	1	Extension Bit	<p>This bit is a 1 if the measurement has been completed and has produced new results.</p> <p>This bit is a zero at power on, after a preset and while a measurement is in Measuring States. See “Triggering of Measurements” on page 148.</p>

Program Examples - STATUS:OPERation:NMRReady:FDD

```

OUTPUT 714;"STATUS:OPERATION:NMRREADY:FDD:EVENT?" !Queries the New Measurement
!Results Ready FDD Event Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:FDD:CONDITION?" !Queries the New
!Measurement Results Ready FDD
!Condition Register.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:FDD:ENABLE 8" !Sets New Measurement Results
!Ready FDD Enable Register
!for bit 3.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:FDD:NTR 2" !Sets the New Measurement Results
!Ready FDD Negative Transition
!Register for bit 1.
OUTPUT 714;"STATUS:OPERATION:NMRREADY:FDD:PTR 4" !Sets the New Measurement
!Results Ready FDD Positive
!Transition Register
!for bit 2

```

STATus:PRESet

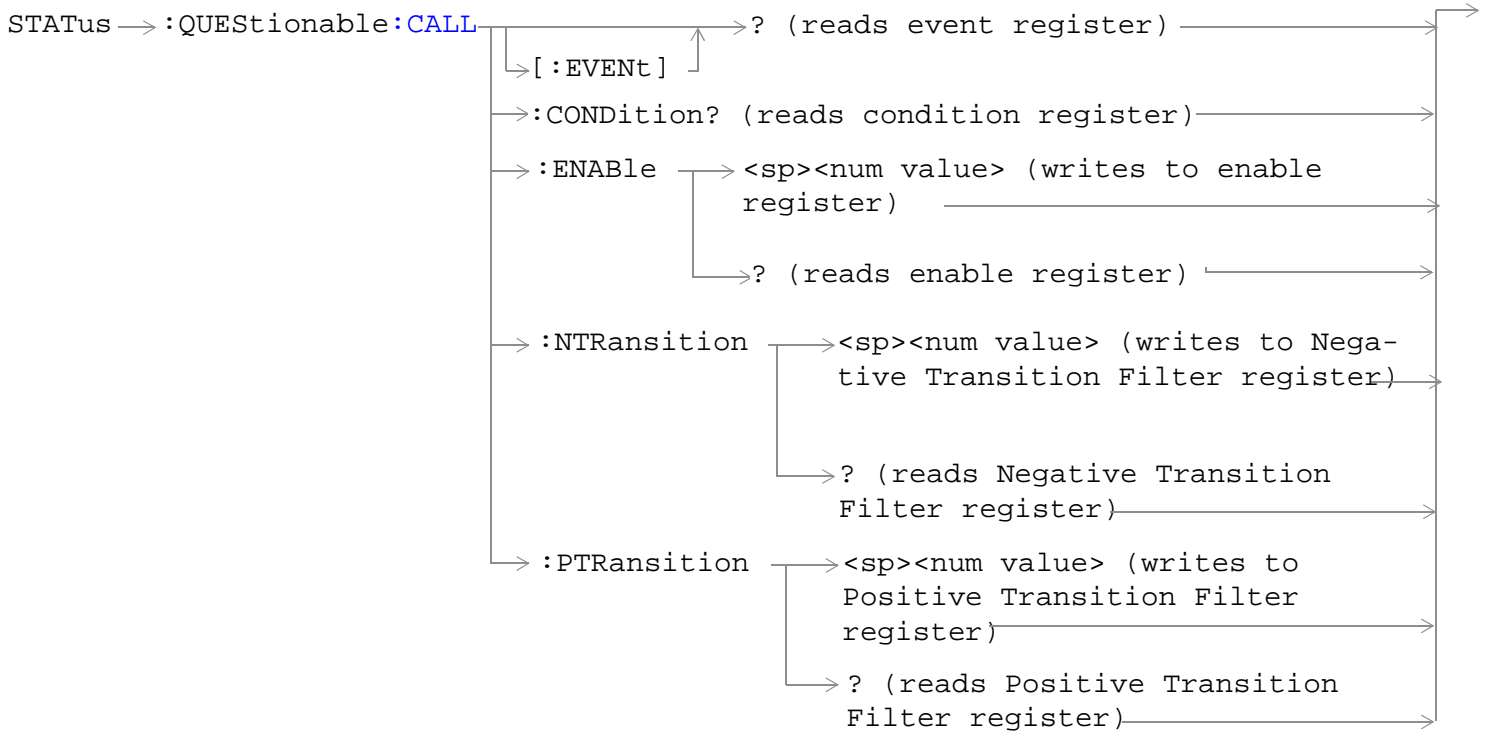
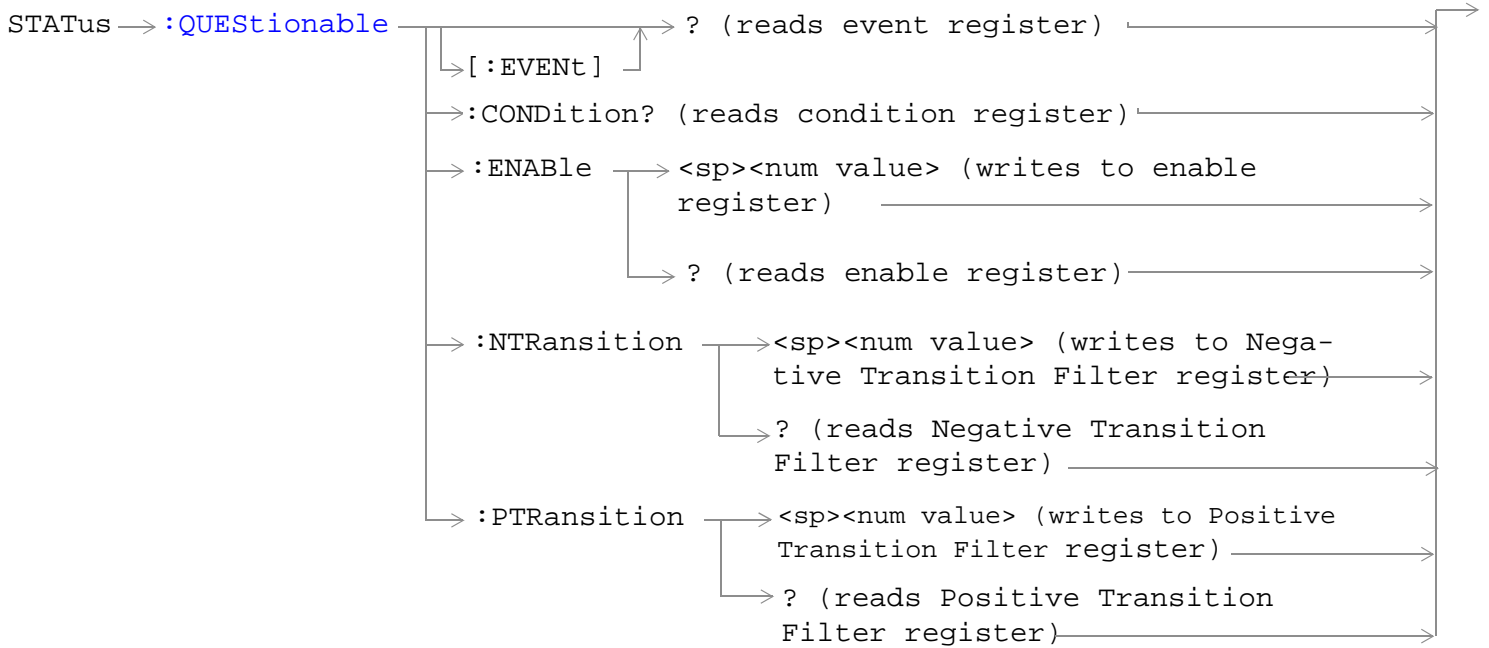
STATus → :PRESet →

[“Diagram Conventions” on page 168](#)

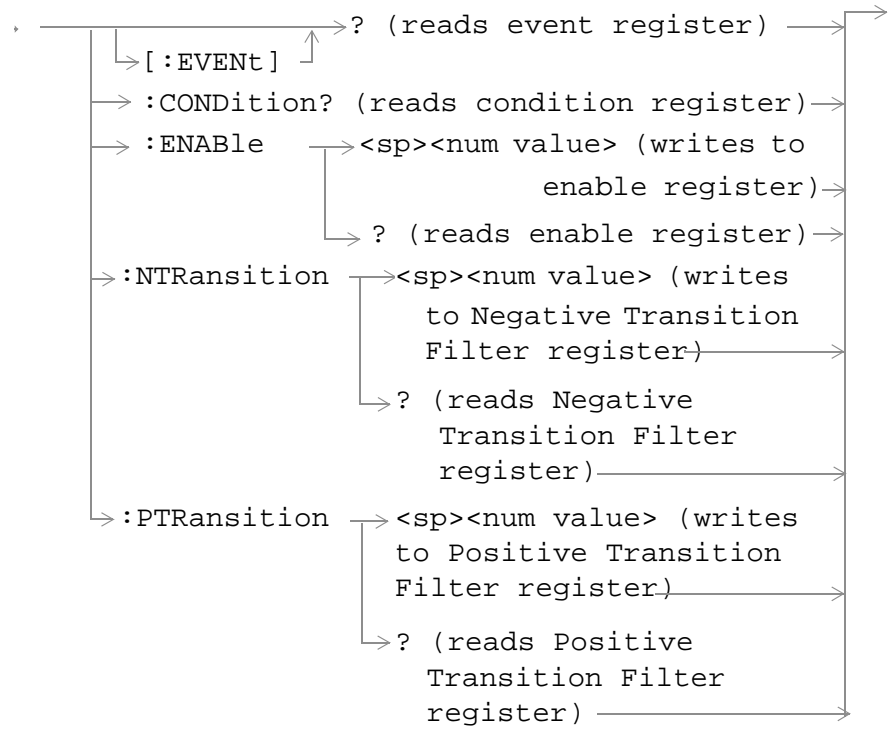
STATus:PRESet

Function	<p>Presets the status subsystem.</p> <p>Presetting the status subsystem performs the following functions:</p> <ul style="list-style-type: none"> • All enable registers are set to 0 (not enabled) • All Positive Transition Registers (PTR's) are set to 1 (positive transitions enabled). • All Negative Transition Registers (NTR's) are set to 0 (negative transitions disabled).
Requirements	Test Application Revision: A.02.00 and above

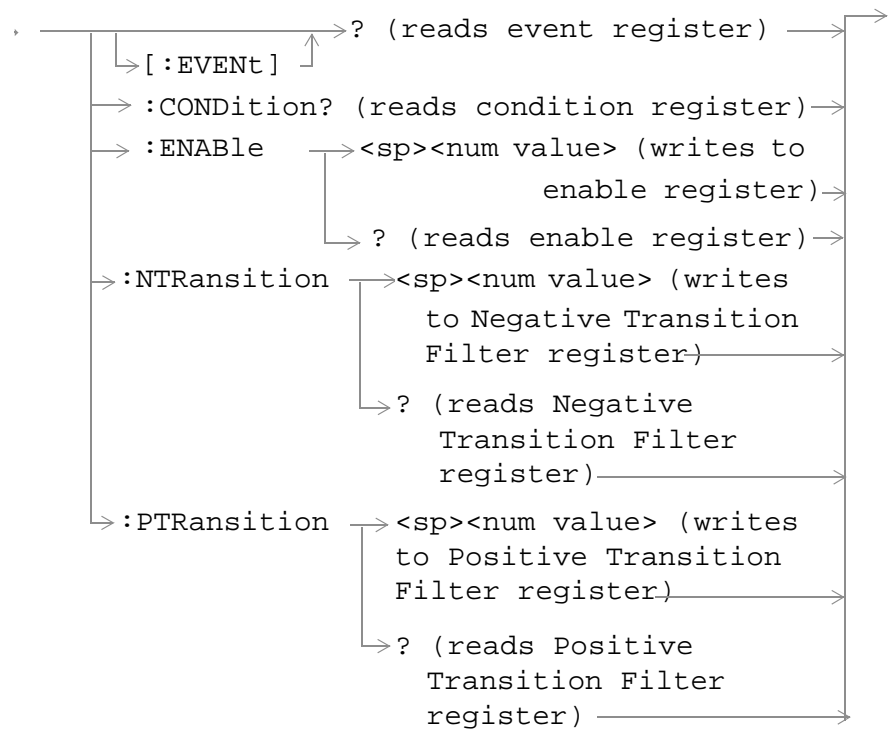
STATUS:QUESTIONABLE



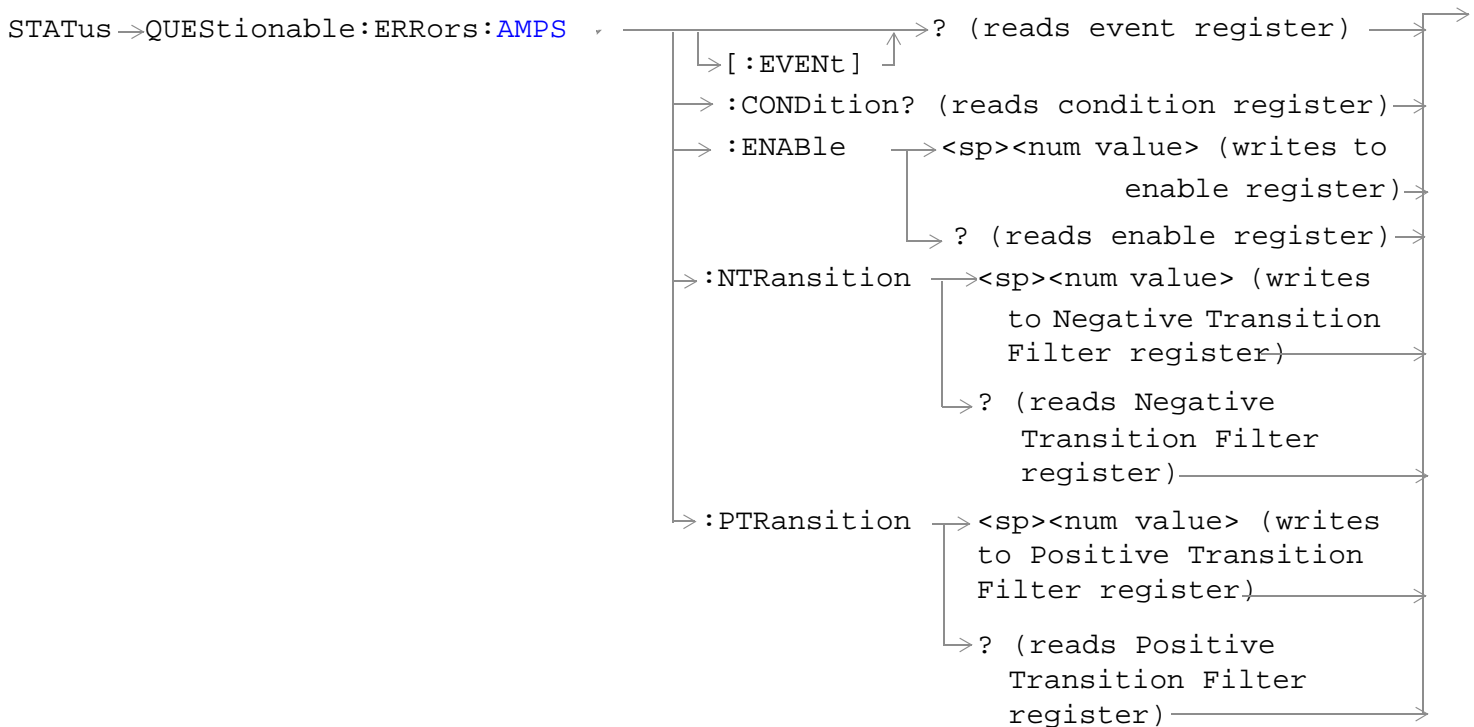
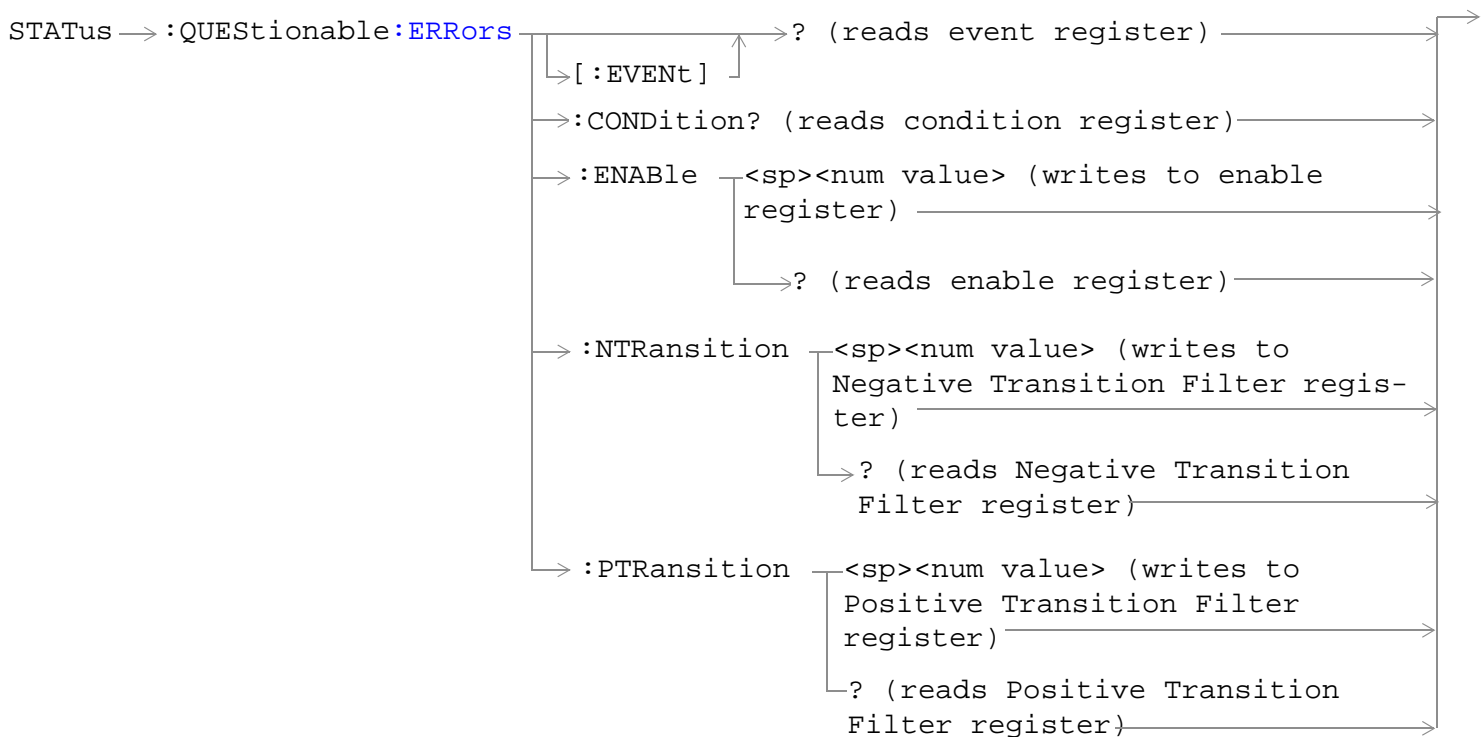
STATUS → QUESTIONABLE:CALL:CDMA

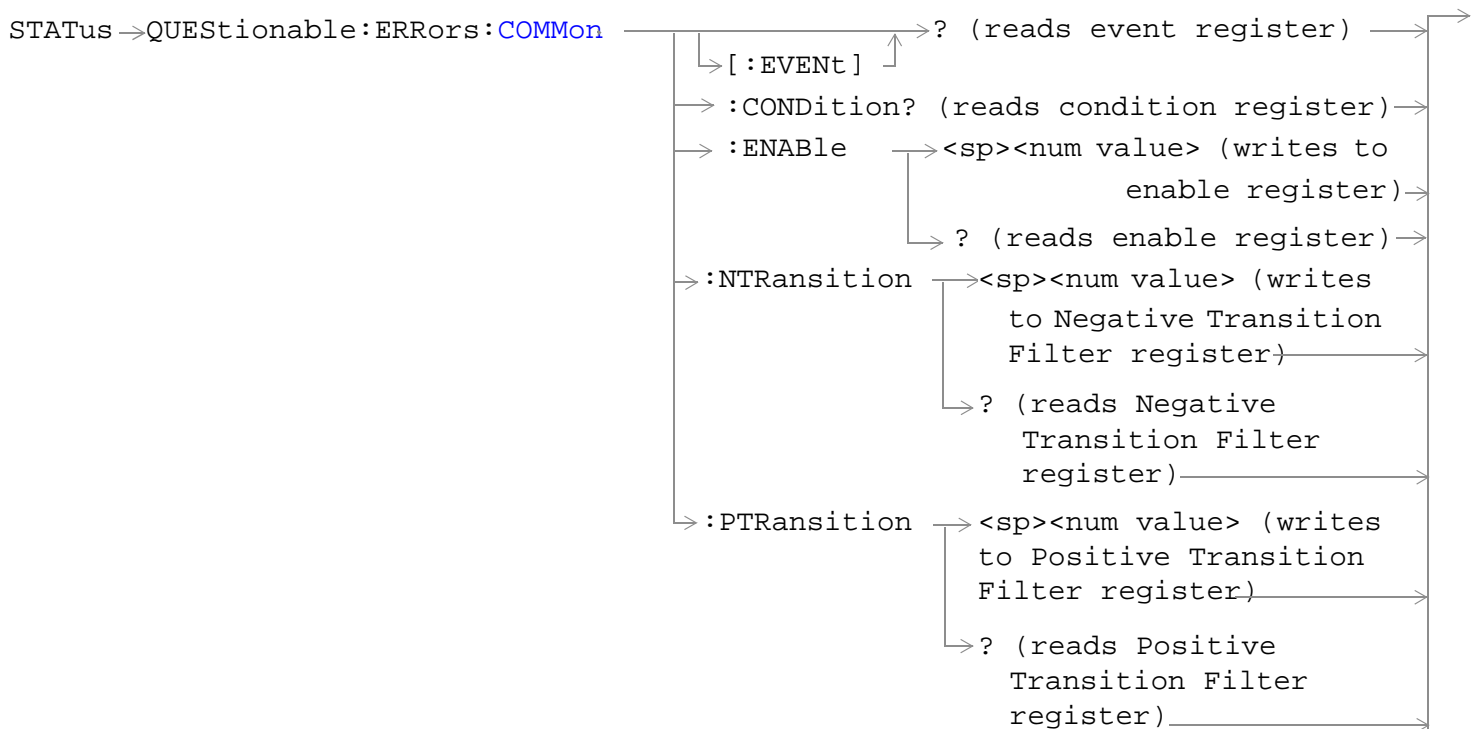
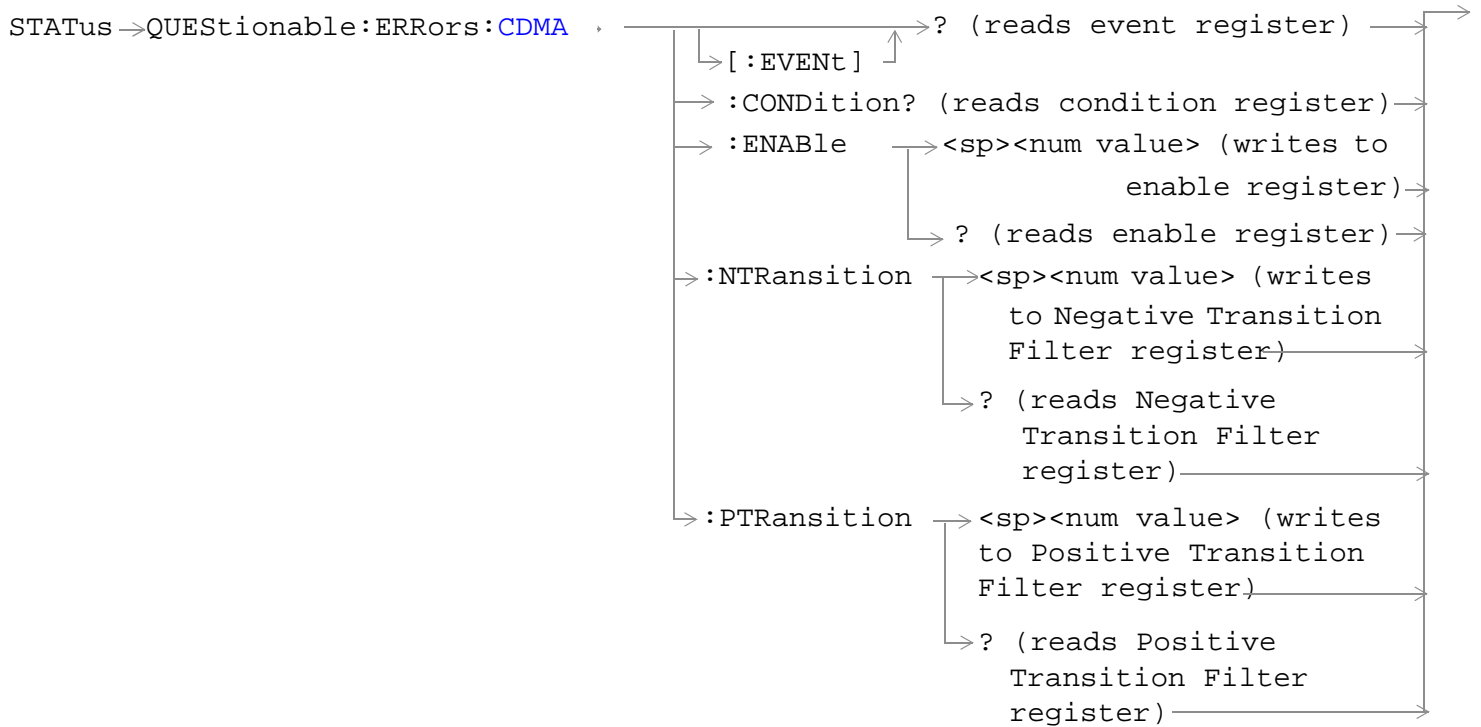


STATUS → QUESTIONABLE:CALL:TA2000

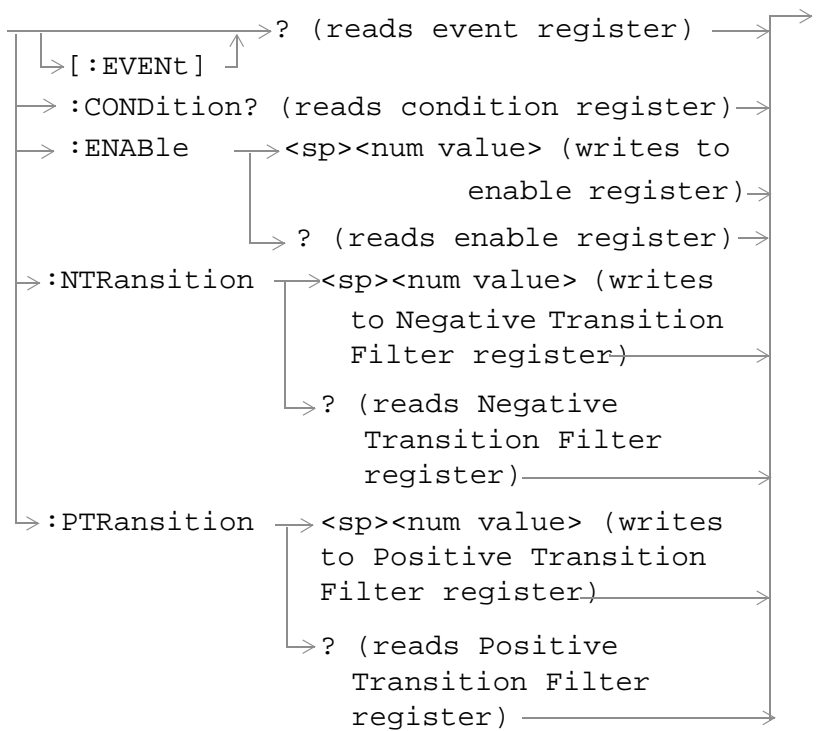


STATUS:QUESTIONABLE

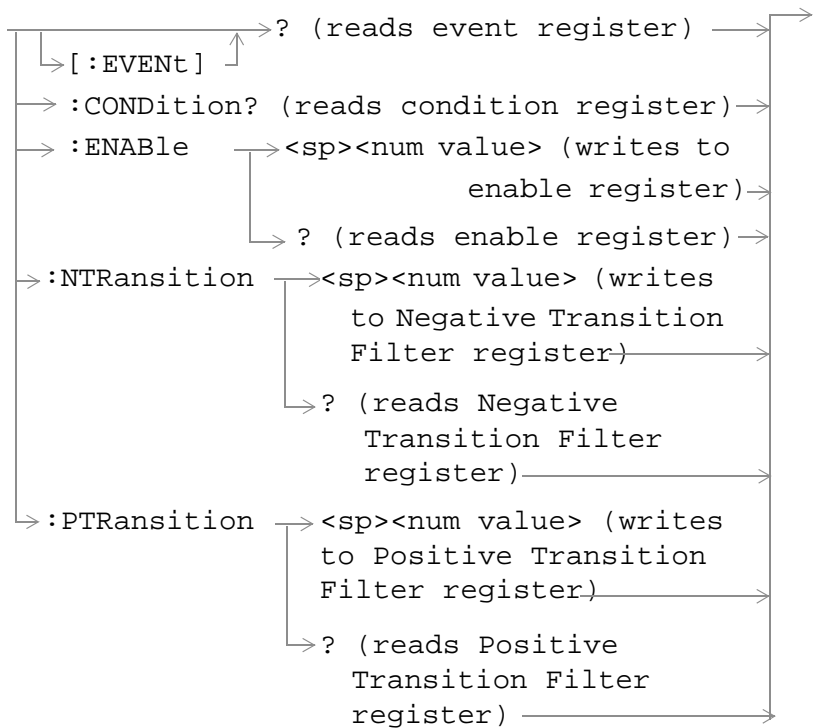




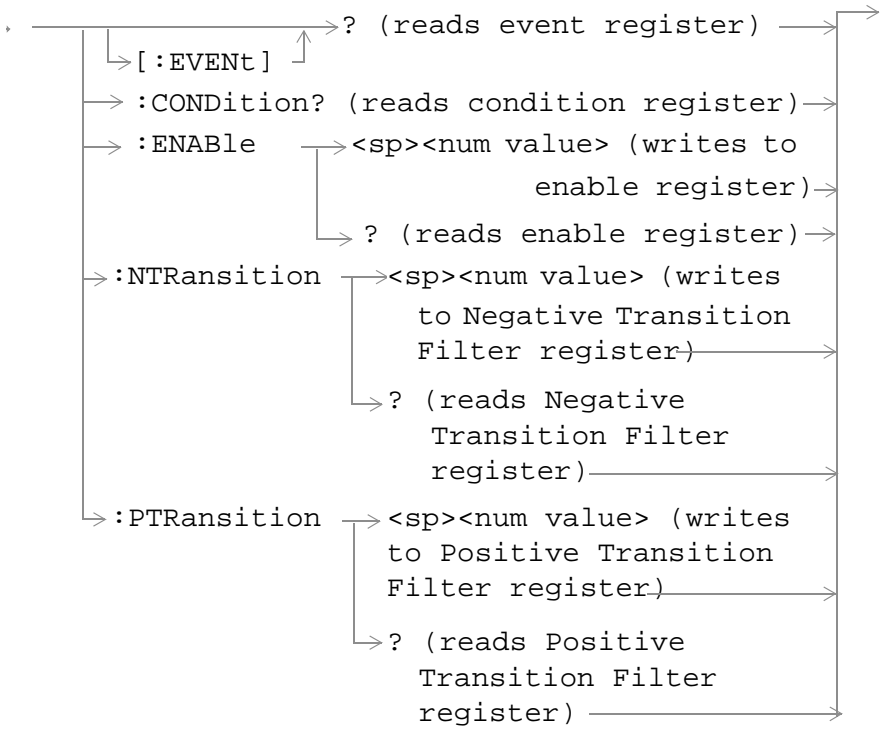
STATUS →QUESTIONABLE:ERRORS:DIGITAL2000



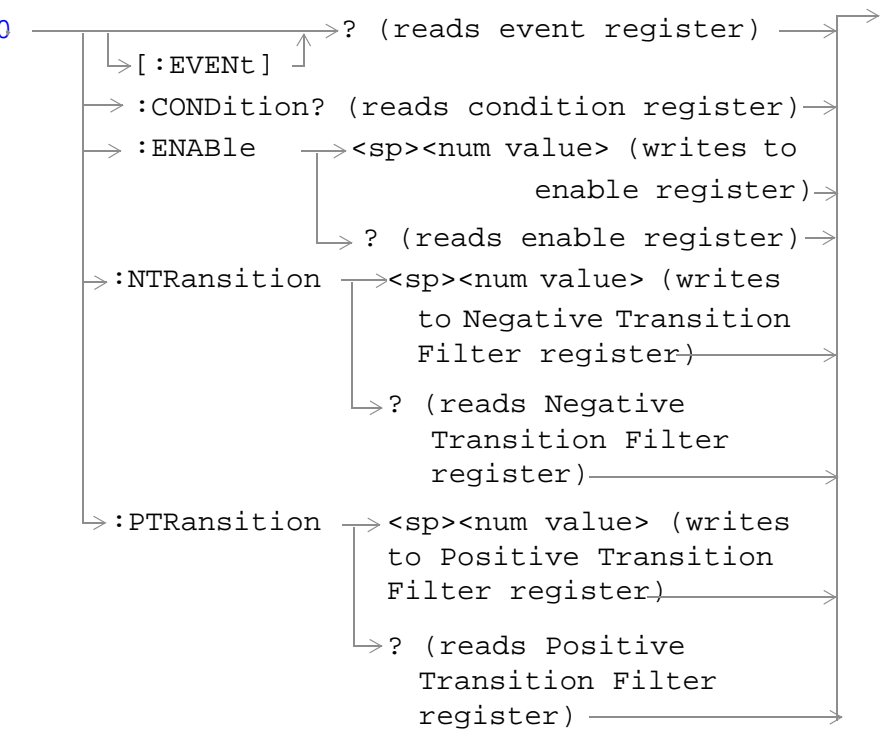
STATUS →QUESTIONABLE:ERRORS:DIGITAL195

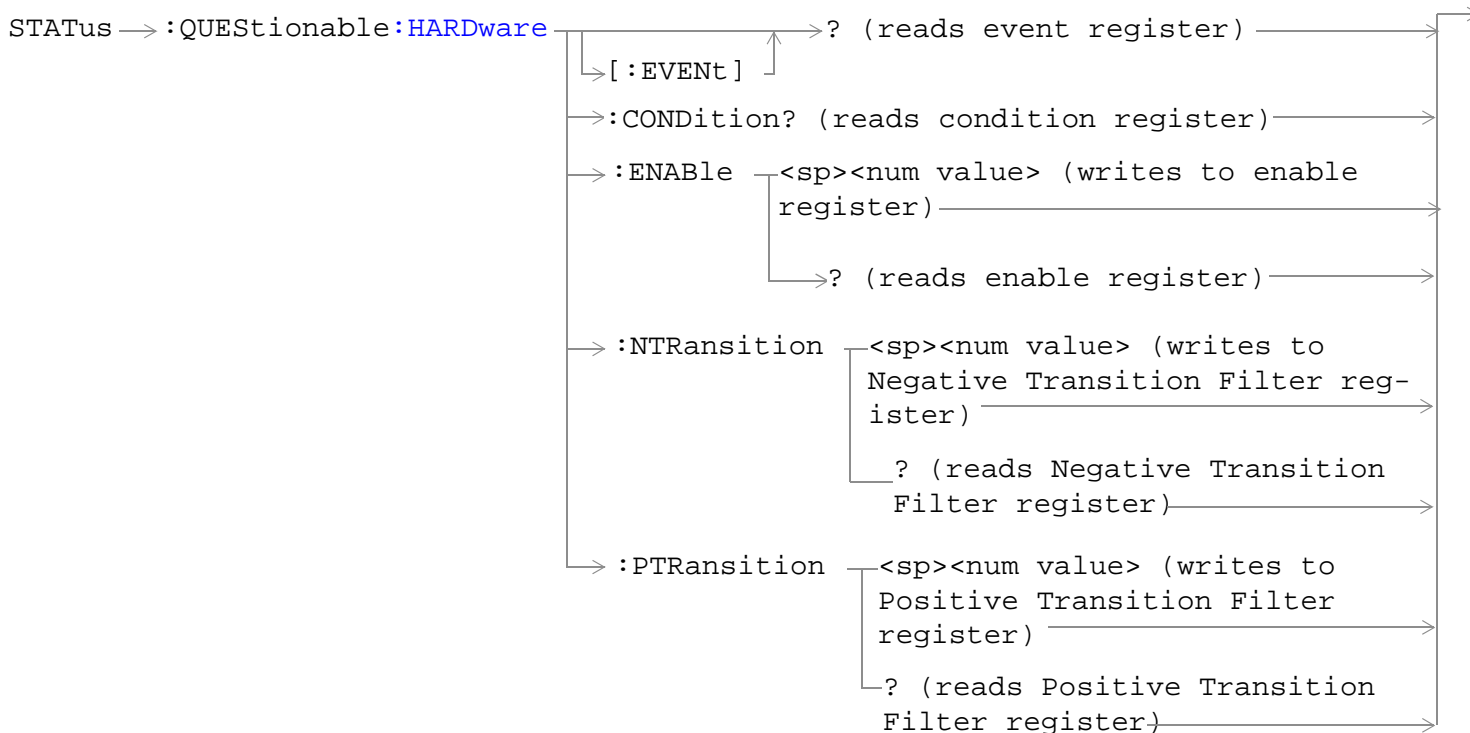
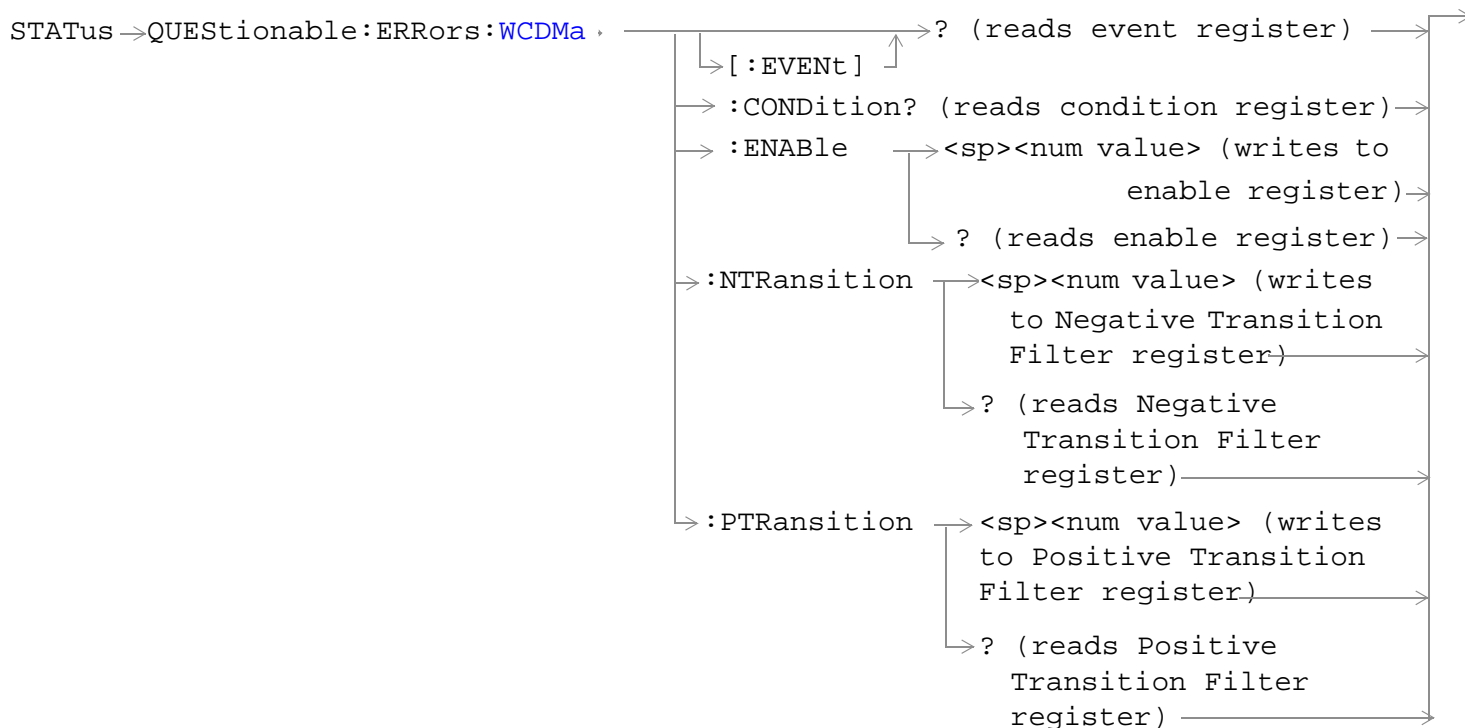


STATUS → QUESTIONABLE:ERRORS:FDD



STATUS → QUESTIONABLE:ERRORS:TA2000





[“Diagram Conventions” on page 168](#)

STATUS:QUESTIONABLE Condition Register Bit Assignment

The STATUS:QUESTIONABLE register contains bits which give an indication that the data currently being acquired or generated is of questionable quality due to some condition affecting the functionality associated with that bit.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	QUESTIONABLE:HARDWARE summary	This bit is the summary message bit for the STATUS:QUESTIONABLE:HARDWARE register.
10	1024	QUESTIONABLE:CALL summary	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL register.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	Reserved for future use.	This bit is always 0.
3	8	Reserved for future use.	This bit is always 0.
2	4	Reserved for future use.	This bit is always 0.
1	2	QUESTIONABLE:ERRORS summary	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS register.
0	1	Reserved for future use.	This bit is always 0.

Program Example - STATUS:QUESTIONABLE Register Bit Assignments

```

OUTPUT 714;"STATUS:QUESTIONABLE:EVENT?" !Queries and clears the Questionable Event
!Register
OUTPUT 714;"STATUS:QUESTIONABLE:CONDITION?" !Queries and clears the Questionable Condition
!Register
OUTPUT 714;"STATUS:QUESTIONABLE:ENABLE 1024" !Sets the Questionable Enable Register
!for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:NTRANSITION 2" !Sets the Questionable Negative
!Transition Filter Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:PTRANSITION 2" !Sets the Questionable Positive
!Transition Filter Register for bit 1
    
```

STATUS:QUESTIONABLE:CALL Condition Register Bit Assignment

The STATUS:QUESTIONABLE:CALL registers will contain information about which event(s) occurred during call processing that indicate what call processing procedure failed

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	TA2000 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:CALL:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:CALL:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:DIGital136 register.
3	8	AMPS Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:AMPS register.
2	4	GSM Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:GSM register.
1	2	COMMOn Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:COMMOn register.
0	1	Extension Bit	This bit is always 0.

Program Example - STATus:QUEStionable:CALL Condition Register Bit Assignment

```
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:EVENT?" !Queries and clears the Questionable
          !Call Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:CONDITION?" !Queries and clears the Questionable
          !Call Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:ENABLE 1024" !Sets the Questionable
          !Call Enable Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:NTRANSITION 2" !Sets the Questionable Call
          !Negative Transition Filter Register
          !for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:PTRANSITION 2" !Sets the Questionable Call
          !Positive Transition Filter Register
          !for bit 1
```

STATUS:QUESTIONABLE:CALL:CDMA Condition Register Bit Assignment

The STATUS:QUESTIONABLE:CALL:CDMA registers will contain information about which event(s) occurred during call processing that indicate what call processing procedure failed

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	Call drop timer timed out.	This bit is a 1 after 250 consecutive bad frames are counted indicating that the reverse link is lost
3	8	Service connect completion not received.	This bit is a 1 when the test set has not received a message from the MS that it has completed the change to a new Service Option or Radio Configuration.
2	4	Service Option or Radio Configuration rejected by MS.	This bit is a 1 when the MS receives a Service Option or a Radio Configuration that it does not support.
1	2	Traffic channel preamble not received.	This bit is a 1 if no preamble was received from the MS.
0	1	Extension Bit.	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:CALL:CDMA Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:CALL:CDMA:EVENT?"
    !Queries and clears the Questionable Call CDMA Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:CDMA:CONDITION?"
    !Queries and clears the Questionable Call CDMA Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:CDMA:ENABLE 1024"
    !Sets the Questionable Call CDMA Enable Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:CDMA:NTRANSITION 2"
    !Sets the Questionable Call CDMA Negative Transition Filter Register !for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:CDMA:PTRANSITION 2"
    !Sets the Questionable Call CDMA Positive Transition Filter Registerfor bit 1
    
```

STATUS:QUESTIONABLE:CALL:TA2000 Condition Register Bit Assignment

The STATUS:QUESTIONABLE:CALL:TA2000 registers will contain information about which event(s) occurred during call processing that indicate what call processing procedure failed

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	Reserved for future use.	This bit is always 0.
8	256	Reserved for future use.	This bit is always 0.
7	128	Reserved for future use.	This bit is always 0.
6	64	Reserved for future use.	This bit is always 0.
5	32	Reserved for future use.	This bit is always 0.
4	16	MS reject order received	This bit is a 1 if the Service Option or Radio Configuration change was rejected by the MS while connected.
3	8	Carrier not detected on new channel	This bit is a 1 when no power is detected by the test set after a handoff or when making a call.
2	4	Handoff completion not received	This bit is a 1 if the test set does not receive a handoff completion message from the MS.
1	2	Release order not received	This bit is a 1 if the MS does not send the call release to the test set.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:CALL:TA2000 Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:CALL:TA2000:EVENT?"
!Queries and clears the Questionable Call Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:TA2000:CONDITION?"
!Queries and clears the Questionable Call Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:TA2000:ENABLE 1024"
!Sets the Questionable Call Enable Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:TA2000:NTRANSITION 2"
!Sets the Questionable Call Negative Transition Filter Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:TA2000:PTRANSITION 2"
!Sets the Questionable Call Positive Transition Filter Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS Condition Register Bit Assignment

The STATUS:QUESTIONABLE:ERRORS register bits will be used to indicate information about test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	TA2000 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:DIGital136 register.
3	8	AMPS Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:AMPS register.
2	4	GSM Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:ERRORS:GSM register.
1	2	COMMon Summary bit	This bit is the summary message bit for the STATUS:QUESTIONABLE:CALL:ERRORS register.
0	1	Extension Bit	This bit is always 0.

Program Example - STATus:QUEStionable:ERRors Register Bit Assignments

```
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:EVENT?" !Queries and clears the Questionable
!Errors Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:CONDITION?" !Queries and clears the Questionable
!Errors Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:ENABLE 1024" !Sets the Questionable
!Errors Enable
!Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:NTRANSITION 2" !Sets the Questionable Errors
!Negative Transition Filter Register
!for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:PTRANSITION 2" !Sets the Questionable Errors
!Positive Transition Filter Register
!for bit 1
```

STATUS:QUESTIONABLE:ERRORS:AMPS Condition Register Bit Assignment

The STATUS:QUESTIONABLE:ERRORS:AMPS register bits will be used to indicate information about AMPS related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Messages	This bit is a 1 when a Maskable Message has occurred. Maskable Messages are not displayed on the test set display.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition is be pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:AMPS Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:AMPS:EVENT?" !Queries and clears the Questionable
!Errors AMPS Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:AMPS:CONDITION?" !Queries and clears the Questionable
!Errors AMPS Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:AMPS:ENABLE 1024" !Sets the Questionable
!Errors AMPS Enable
!Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:AMPS:NTRANSITION 2" !Sets the Questionable Errors
!AMPS Negative Transition
!Filter Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:AMPS:PTRANSITION 2" !Sets the Questionable Errors
!AMPS Positive Transition
!Filter Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:CDMA Register Bit Assignments

The STATUS:QUESTIONABLE:ERRORS:CDMA register bits will be used to indicate information about CDMA related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit will be pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you may query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:CDMA Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:CDMA:EVENT?" !Queries and clears the Questionable
!Errors CDMA Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:CDMA:CONDITION?" !Queries and clears the Questionable
!Errors CDMA Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:CDMA:ENABLE 1024" !Sets the Questionable
!Errors CDMA Enable
!Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:CDMA:NTRANSITION 2" !Sets the Questionable Errors
!CDMA Negative Transition
!Filter Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:CDMA:PTRANSITION 2" !Sets the Questionable Errors
!CDMA Positive Transition
!Filter Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:COMMON Register Bit Assignments

The STATUS:QUESTIONABLE:ERRORS:COMMON register bits will be used to indicate information about the COMMON test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:COMMON Register Bit Assignments

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:COMMON:EVENT?" !Queries and clears the Questionable
!Errors Common Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:COMMON:CONDITION?" !Queries the and clears the
!Questionable Errors
!Common Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:COMMON:ENABLE 1024" !Sets the Questionable
!Errors Common Enable
!Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:COMMON:NTRANSITION 2" !Sets the Questionable Errors
!Common Negative Transition
!Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:COMMON:PTRANSITION 2" !Sets the Questionable Errors
!Common Positive Transition
!Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:DIGITAL2000Condition Register Bit Assignment

The STATUS:QUESTIONABLE:ERRORS:DIGITAL2000 register bits will be used to indicate information about DIGITAL2000 related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit will always be 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:DIGITAL2000 Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL2000:EVENT?" !Queries and clears the
!Questionable Errors
!DIGITAL2000 Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL2000:CONDITION?" !Queries and clears the
!Questionable Errors
!DIGITAL2000 Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL2000:ENABLE 1024" !Sets the Questionable
!Errors DIGITAL2000 Enable
!Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL2000:NTRANSITION 2" !Sets the Questionable
!Errors DIGITAL2000 Negative
!Transition Filter
!Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL2000:PTRANSITION 2" !Sets the Questionable
!Errors DIGITAL2000 Positive
!Transition Filter
!Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:DIGITAL95 Condition Register Bit Assignment

The STATUS:QUESTIONABLE:ERRORS:DIGITAL95 register bits will be used to indicate information about DIGITAL95 related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit will always be 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:DIGITAL95 Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL95:EVENT?" !Queries and clears the
                !Questionable Errors
                !DIGITAL95 Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL95:CONDITION?" !Queries and clears the
                !Questionable Errors
                !DIGITAL95 Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL95:ENABLE 1024" !Sets the Questionable
                !Errors DIGITAL95 Enable
                !Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL95:NTRANSITION 2" !Sets the Questionable
                !Errors DIGITAL95 Negative
                !Transition Filter
                !Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:DIGITAL95:PTRANSITION 2" !Sets the Questionable
                !Errors DIGITAL95 Positive
                !Transition Filter
                !Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:FDD Register Bit Assignments

The STATUS:QUESTIONABLE:ERRORS:FDD register bits will be used to indicate information about FDD related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. Query the Event Register to find out if one of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:FDD Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:FDD:EVENT?" !Queries and clears the
                                     !Questionable Errors
                                     !FDD Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:FDD:CONDITION?" !Queries and clears the
                                     !Questionable Errors
                                     !FDD Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:FDD:ENABLE 1024" !Sets the Questionable
                                     !Errors FDD Enable
                                     !Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:FDD:NTRANSITION 2" !Sets the Questionable
                                     !Errors FDD Negative
                                     !Transition Filter
                                     !Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:FDD:PTRANSITION 2" !Sets the Questionable
                                     !Errors FDD Positive
                                     !Transition Filter
                                     !Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:TA2000 Register Bit Assignments

The STATUS:QUESTIONABLE:ERRORS:TA2000 register bits will be used to indicate information about TA2000 related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. Query the Event Register to find out if one of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:TA2000 Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:TA2000:EVENT?" !Queries and clears the
                                                    !Questionable Errors
                                                    !TA2000 Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:TA2000:CONDITION?" !Queries and clears the
                                                    !Questionable Errors
                                                    !TA2000 Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:TA2000:ENABLE 1024" !Sets the Questionable
                                                    !Errors TA2000 Enable
                                                    !Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:TA2000:NTRANSITION 2" !Sets the Questionable
                                                    !Errors TA2000 Negative
                                                    !Transition Filter
                                                    !Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:TA2000:PTRANSITION 2" !Sets the Questionable
                                                    !Errors TA2000 Positive
                                                    !Transition Filter
                                                    !Register for bit 1
    
```

STATUS:QUESTIONABLE:ERRORS:WCDMA Register Bit Assignments

The STATUS:QUESTIONABLE:ERRORS:WCDMA register bits will be used to indicate information about WCDMA related test set device-specific errors (positive error numbers).

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	MUI Maskable Message.	
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit is always 0.
11	2048	Reserved for future use.	This bit is always 0.
10	1024	Reserved for future use.	This bit is always 0.
9	512	+900 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +900 to +999 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
8	256	+800 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +800 to +899 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
7	128	+700 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +700 to +799 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
6	64	+600 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +600 to +699 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
5	32	+500 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +500 to +599 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
4	16	+400 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +400 to +499 range occurs. Query the Event Register to find out if one of these errors occurred.
3	8	+300 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +300 to +399 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
2	4	+200 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +200 to +299 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
1	2	+100 Errors	The condition bit is pulsed to a 1 and immediately back to 0 if an error in the +100 to +199 range occurs. After setting the Positive Transition Filter and the Negative Transition Filter you can query the Event Register to find out which of these errors occurred.
0	1	Extension Bit	This bit is always 0.

Program Example - STATUS:QUESTIONABLE:ERRORS:WCDMA Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:WCDMA:EVENT?" !Queries and clears the
                                     !Questionable Errors
                                     !WCDMA Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:WCDMA:CONDITION?" !Queries and clears the
                                     !Questionable Errors
                                     !WCDMA Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:WCDMA:ENABLE 1024" !Sets the Questionable
                                     !Errors WCDMA Enable
                                     !Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:WCDMA:NTRANSITION 2" !Sets the Questionable
                                     !Errors WCDMA Negative
                                     !Transition Filter
                                     !Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:WCDMA:PTRANSITION 2" !Sets the Questionable
                                     !Errors WCDMA Positive
                                     !Transition Filter
                                     !Register for bit 1
    
```

STATUS:QUESTIONABLE:HARDWARE Condition Register Bit Assignment

The STATUS:QUESTIONABLE:HARDWARE register bits give an indication that the data/signals currently being acquired or generated are of questionable quality.

Bit Number	Binary Weighting	Condition	Description
15	32768	Not Used. Defined by SCPI.	This bit is always 0.
14	16384	Reserved for future use.	This bit is always 0.
13	8192	Reserved for future use.	This bit is always 0.
12	4096	Reserved for future use.	This bit will always be 0.
11	2048	Reserved for future use.	This bit will always be 0.
10	1024	Reserved for future use.	This bit will always be 0.
9	512	Reserved for future use.	This bit will always be 0.
8	256	Reserved for future use.	This bit will always be 0.
7	128	Reserved for future use.	This bit will always be 0.
6	64	Reserved for future use.	This bit will always be 0.
5	32	Reserved for future use.	This bit will always be 0.
4	16	Power-up Self Test(s) Failed	This bit will be a 1 if the power-up self tests failed.
3	8	Reserved for future use.	This bit will always be 0.
2	4	Reserved for future use.	This bit will always be 0.
1	2	Reserved for future use.	This bit will always be 0.
0	1	Extension Bit.	This bit will always be 0.

Program Example - STATUS:QUESTIONABLE:HARDWARE Condition Register Bit Assignment

```

OUTPUT 714;"STATUS:QUESTIONABLE:HARDWARE:EVENT?" !Queries and clears the Questionable
                                     !Hardware Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:HARDWARE:CONDITION?" !Queries and clears the Questionable
                                     !Hardware Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:HARDWARE:ENABLE 1024" !Sets the Questionable
                                     !Hardware Enable
                                     !Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:HARDWARE:NTRANSITION 2" !Sets the Questionable
                                     !Hardware Negative Transition Filter
                                     !Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:HARDWARE:PTRANSITION 2" !Sets the Questionable
                                     !Hardware Positive Transition Filter
                                     !Register for bit 1
    
```

Status Byte Register

*STB?

*STB?

NOTE The Status Byte Register can also be read with a serial poll. For example, the command "Status_byte = SPOLL(714)" would perform a serial poll of the Status Byte Register, returning and releasing RQS (bit 6).

Status Byte Register Bit Assignments

Bit Number	Binary Weighting	Label	Description
7	128	STATUS: OPERATION	Summarizes the STATUS: OPERATION Status Register, which fans out to the NMRReady and CALL Status Registers.
6	64	RQS (SRQ TRUE?)/Master Summary Status	RQS is read by a serial poll (SPOLL) Master Summary Status is read by a *STB? query - defined by IEEE 488.2
5	32	Standard Event Status Register	Summarizes the Standard Event Status Register
4	16	Message Available	SCPI - Defined
3	8	STATUS: QUESTIONABLE Status Register	Summary Message comes from the STATUS: QUESTIONABLE Status Register, which fans out to the CALL and HARDWARE Status Registers
2	4	Error/ Event Queue	SCPI - Defined
1	2	Reserved	
0	1	Reserved	

Program Example - Status Byte Register Bit Assignments

```
OUTPUT 714;"*STB?" !Queries the Status Byte.
```

Standard Event Status Register

*ESR?

*ESR? → Reads and clears the Std Event Status Register. →

*ESE?

*ESE? → Reads the Std Event Status Register Enable Register →

*ESE

*ESE → Writes to the Std Event Status Register Enable Register →

[“Diagram Conventions” on page 168](#)

Standard Event Status Register Bit Assignment

Bit Number	Binary Weighting	Condition	Description
15	32768	Reserved by IEEE.	This bit will always be 0.
14	16384	Reserved by IEEE.	This bit will always be 0.
13	8192	Reserved by IEEE.	This bit will always be 0.
12	4096	Reserved by IEEE.	This bit will always be 0.
11	2048	Reserved by IEEE.	This bit will always be 0.
10	1024	Reserved by IEEE.	This bit will always be 0.
9	512	Reserved by IEEE.	This bit will always be 0.
8	256	Reserved by IEEE.	This bit will always be 0.
7	128	Power On	This bit is set to 1 if the power supply has been turned off and on since the last time this register was read or otherwise cleared. Defined in "IEEE Std. 488.2-1992", 11.5.1.1.2
6	64	Reserved for future use.	This bit will always be 0.
5	32	Command Error	This bit is set to 1 if the test set detects an error while trying to process a command. The following events cause a command error: <ul style="list-style-type: none"> • An IEEE 488.2 syntax error. The test set received a message that did not follow the syntax defined by the standard. • A semantic error. For example the test set received an incorrectly spelled command. • The test set received a group execution trigger (GET) inside a program message
4	16	Execution Error	This bit is set to 1 if the test set detects an error while trying to execute a command. The following events cause a execution error: <ul style="list-style-type: none"> • A <PROGRAM DATA> element received in a command is outside the legal range for the test set, or it is inconsistent with the operation of the test set. • The test set could not execute a valid command due to some test set hardware/firmware condition.
3	8	Device Dependent Error	This bit is set to 1 if a test set operation does not execute properly due to an internal condition (such as, overrange). This bit indicates that the error was not a command, query, or execution error.

Standard Event Status Register

Bit Number	Binary Weighting	Condition	Description
2	4	Query Error	This bit is set to 1 if an error has occurred while trying to read the test set's output queue. The following events cause a query error: <ul style="list-style-type: none">• An attempt is made to read data from the output queue when no data is present or is pending.• Data in the output queue has been lost. An example of this would be an output queue overflow.
1	2	Reserved for future use.	This bit will always be 0.
0	1	Operation Complete	This bit is set to 1 when the test set has completed all pending operations and is ready to accept new commands. This bit is only generated in response to the *OPC IEEE 488.2 common command.

Program Example - Standard Event Status Register

```
OUTPUT 714;"*ESR?" !Queries (reads) the Standard Event Status Register.
```

SYSTem Subsystem

Description

The SYSTem subsystem performs system level configuration functions of the test set.

Syntax Diagrams and Command Descriptions

[“SYSTem:APPLication” on page 380](#)

[“SYSTem:BEEPer” on page 387](#)

[“SYSTem:COMMunicate” on page 388](#)

[“SYSTem:CONFigure:INFormation:HARDware:VERBose?” on page 392](#)

[“SYSTem:CORRection” on page 393](#)

[“SYSTem:CURREnt:TA” on page 399](#)

[“SYSTem:DATE” on page 400](#)

[“SYSTem:ERRor?” on page 401](#)

[“SYSTem:MEASurement:RESet” on page 402](#)

[“SYSTem:PRESet” on page 403](#)

[“SYSTem:ROSCillator” on page 404](#)

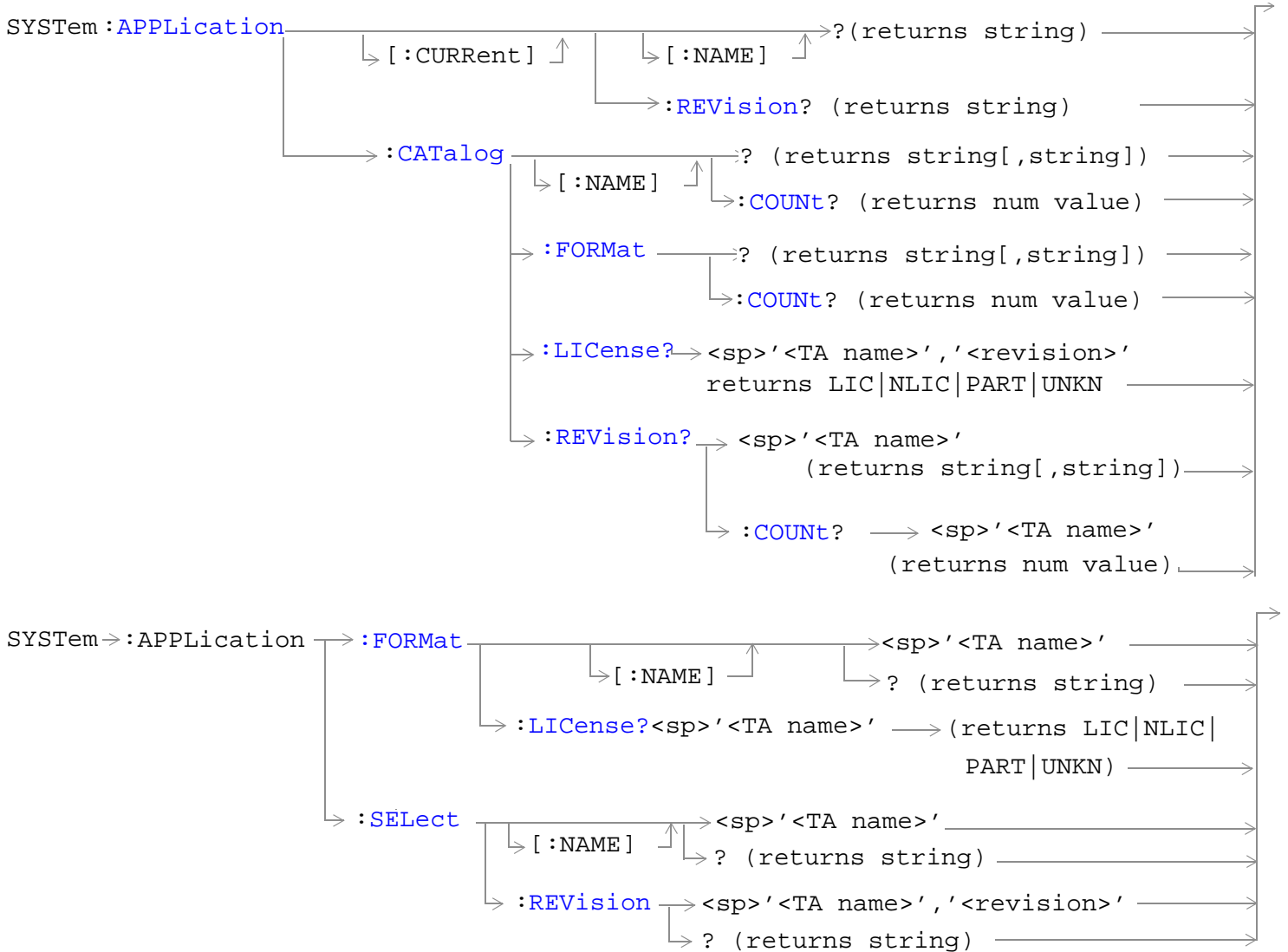
[“SYSTem:SYNChronized” on page 405](#)

[“SYSTem:TIME” on page 406](#)

[“SYSTem:TZONE” on page 407](#)

[“SYSTem:UTC” on page 408](#)

SYSTEM:APPLICATION



["Diagram Conventions" on page 168](#)

SYSTem:APPLication[:CURRent][:NAME]?

Function	Query the test set for the name of the currently running test application.
Query	Range: See “ SYSTem:APPLication:CATalog[:NAME]? ” and null string.
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "SYSTEM:APPLICATION:CURRENT:NAME?"	

SYSTem:APPLication[:CURRent]:REVision?

Function	Query the test set for the currently running test application revision number.
Query	Range: Any string up to 20 characters including null. A typical example would be A.01.01 for a licensed version.
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "SYSTEM:APPLICATION:CURRENT:REVISION?"	

SYSTem:APPLication:CATalog[:NAME]?

Function	Query the test set for all of the names of the test applications stored on the hard drive. This query returns one or more strings, each string is separated by a comma.
Query	Range: AMPS/136 Mobile Test CDMA 2000 Mobile Test GSM Mobile Test GSM/GPRS Mobile Test GSM_AMPS/136_GPRS Mobile WCDMA Mobile Test
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714; "SYSTEM:APPLICATION:CATALOG:NAME?"	

SYSTEM:APPLICATION:CATALOG[:NAME]:COUNT?

Function	Query the test set for the total number test application names stored on the hard drive. Up to 30 test applications can be stored.
Query	Range: 0 through 30
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME:COUNT?"	

SYSTEM:APPLICATION:CATALOG:FORMAT?

Function	Queries the test set for the names of all formats that are available in a fast switching test application. A licensed fast switching test application must be selected to use this command. This query returns one or more strings, each string is separated by a comma.
Query	Range: A string up to 25 characters, or the null string. <ul style="list-style-type: none"> • "GSM" • "AMPS/136" • "GPRS"
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:FORMAT?"	

SYSTEM:APPLICATION:CATALOG:FORMAT:COUNT?

Function	Queries the test set for the total number of formats available in a fast switching test application. A licensed fast switching test application must be selected to use this command.
Query	Range: 0 to 3
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:FORMAT:COUNT?"	

SYSTem:APPLication:CATalog:LICense? '<test application name>','<revision>'

Function	<p>Query the license status for a selected revision.</p> <p>The query must include two strings separated by a comma. The test application name and revision must be entered as they appear in the test application Setup menu, with the exception that the string is not case sensitive and can be entered in any combination of upper and lower case letters.</p> <p>The returned values are:</p> <ul style="list-style-type: none"> • "LIC" indicates this is a licensed test application. • "NLIC" indicates this is not a licensed test application. • "PART" not all test applications that correspond to the fast switching test application radio formats are licensed. • "UNKN" indicates that license status is unknown.
Query	Range: LIC NLIC PART UNKN
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:LICENSE? 'GSM mobile test','A.04.00'"</pre>	

SYSTem:APPLication:CATalog:REVision? '<test application name>'

Function	<p>Query the test set for all revision numbers stored on the test set's hard drive for a specific test application. You must specify a test application.</p> <p>The test application name must be entered as it appears in the test application Setup menu, with the exception that the string is not case sensitive and can be entered in any combination of upper and lower case letters.</p>
Query	Range: One or more comma separated strings or a null string
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION? 'AMPS/136 MOBILE TEST'"</pre>	

SYSTem:APPLication:CATalog:REVision:COUNT? '<test application name>'

Function	<p>Query the test set for the number of revisions present on the hard disk for a specified test application. Up to 30 revisions can be stored for a test application.</p> <p>The test application name must be entered as it appears in the test application Setup menu, with the exception that the string is not case sensitive and can be entered in any combination of upper and lower case letters.</p>
Query	Range: 0 through 30
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION:COUNT? 'AMPS/136 MOBILE TEST' "</pre>	

SYSTem:APPLication:FORMat[:NAME]

Function	<p>Switches formats in a fast switching test application. A licensed fast switching test application must be selected to use this command.</p> <p>Queries the test set for the name of the currently active format. This string is not case sensitive.</p>
Setting	<p>Range:</p> <ul style="list-style-type: none"> • 'GSM' • 'AMPS/136' • 'GPRS' • 'IS-2000/IS-95/AMPS' • 'WCDMA'
Query	<p>Range: A string up to 25 characters, or the null string.</p> <ul style="list-style-type: none"> • "GSM" • "AMPS/136" • "GPRS" • "IS-2000/IS-95/AMPS" • "WCDMA"
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:FORMAT:NAME 'AMPS/136' "</pre> <pre>OUTPUT 714;"SYSTEM:APPLICATION:FORMAT:NAME?"</pre>	

SYSTem:APPLication:FORMat:LiCense? '<format name>'

Function	<p>Queries the test set for the license status of the fast switching test application.</p> <p>The returned values are:</p> <ul style="list-style-type: none"> • LIC indicates this is a licensed test application. • NLIC indicates this is not a licensed test application. • PART indicates that only part of the test application with multiple formats is licensed. • UNKN indicates that license status is unknown.
Query	Range: LIC NLIC PART UNKN
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:FORMAT:LICENSE? 'AMPS/136' "</pre>	

SYSTem:APPLication:SElect[:NAME] '<test application name>'

Function	<p>Selects a test application and reboots the test set. This will switch the test application to the revision already selected. There is no need to re-select the revision before switching. The reboot process takes about 1 minute.</p> <p>Queries the test set for the test application that is selected and will run after the next reboot of the test set.</p> <p>The test application name must be entered as it appears in the test application Setup menu, with the exception that the string is not case sensitive and can be entered in any combination of upper and lower case letters.</p> <hr/> <p>NOTE Selecting the correct name and the desired revision of a test application is important. This information should be reviewed before proceeding. The directions for how to determine test application name and revision are found in this document.</p> <hr/>
Setting	Range: See "SYSTem:APPLication:CATalog[:NAME]?" .
Query	Range: See "SYSTem:APPLication:CATalog[:NAME]?" and null string.
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME 'AMPS/136 MOBILE TEST' "</pre> <pre>OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME?"</pre>	

SYSTem:APPLication:SELEct:REVision '<test application name>','<revision>'

<p>Function</p>	<p>Selects a revision for particular test application.</p> <p>The revision does not need to be set in order to switch test applications. The only time you select revisions is to change revisions.</p> <p>Queries the test set for the revision of a specified test application.</p> <p>The test application name and revision must be entered as they appear in the test application Setup menu, with the exception that the string is not case sensitive and can be entered in any combination of upper and lower case letters.</p> <hr/> <p>NOTE GSM Mobile Test; revisions before A.04.00 did not have test application switching and provide no way to return to revisions that have switching. Users will need to reload a revision that has test application switching following the download process for upgrading firmware.</p> <hr/>
<p>Setting</p>	<p>Range: A valid test application name and revision number for any licensed test application.</p>
<p>Query</p>	<p>Range: A string up to 20 characters, or the null string.</p>
<p>Requirements</p>	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION `GSM MOBILE TEST','A.04.00'" OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION? `GSM MOBILE TEST'"</pre>	

Related Topics

- [“Test Application Switching” on page 506](#)
- [“Test Application Revisions and Licenses” on page 508](#)
- [“Test Application Name” on page 510](#)
- [“SYSTem:CURRent:TA” on page 399](#)

SYSTem:BEEPer

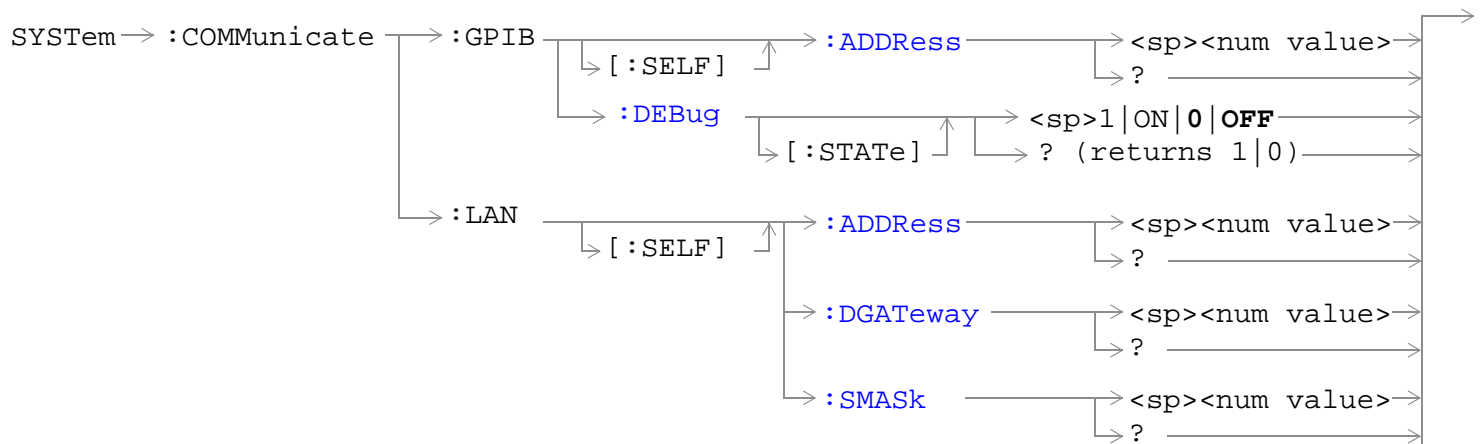


“Diagram Conventions” on page 168

SYSTem:BEEPer:STATe

Function	Sets/queries the beeper state of the test set.
Setting	0 OFF 1 ON
Query	0 1
*RST Setting	1 (on)
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:BEEPER:STATE OFF" !Sets beeper state to off.	

SYSTem:COMMunicate



“Diagram Conventions” on page 168

SYSTem:COMMunicate:GPIB[:SELF]:ADDRESS

Function	Sets/queries the test set's GPIB address.
Setting	Range: 0 to 30 Resolution: 1
Query	Range: 0 to 30 Resolution: 1
Factory setting	14 (this parameter is not affected by any reset operation and can only be changed by direct user access)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"SYSTEM:COMMUNICATE:GPIB:SELF:ADDRESS 14" !Sets the GPIB address to 14.	

SYSTem:COMMunicate:GPIB:DEBUg[:STATe]

Function	Sets/queries the test set's SCPI debugger state. When the state is on; enhanced error messages (generated from GPIB commands with syntax errors) are shown the test set display. The error message is printed along with the syntax. <ERR> is displayed at the end of the incorrect node. Non-printable characters will be replaced with the \$ symbol. See "Error Messages" on page 456 for a list of the errors. The debugger state should be set to on only during GPIB code development. Test times will increase if the debugger state is left on.
Setting	Range: 0 OFF 1 ON
Query	0 1
*RST setting	0 (off)
Requirements	Test Application Revision: A.02.00 and above
Programming Example	
OUTPUT 714;"SYSTEM:COMMUNICATE:GPIB:DEBUG:STATE ON" !Sets debugger to on.	

SYSTem:COMMunicate:LAN[:SELF]:ADDReSS

Function	Sets/queries the test set's LAN IP address. The value of A is used to determine the subnet mask, see " SYSTem:COMMunicate:LAN[:SELF]:SMASk " on page 391. If the LAN address is changed the subnet mask should be checked to insure that it is set to the proper class for that LAN address.
Setting	Range: 15 characters formatted as follows: A.B.C.D where A= 0 to 223 B,C,D = 0 to 255 (no embedded spaces)
Query	Range: 15 characters formatted as follows: A.B.C.D where A= 0 to 223 B,C,D = 0 to 255 (no embedded spaces)
Factory setting	0.0.0.0 (this parameter is not affected by any reset operation and can only be changed by direct user access)
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:COMMUNICATE:LAN:SELF:ADDRESS '130.015.156.255'" !Sets the LAN IP address.</pre>	

SYSTem:COMMunicate:LAN[:SELF]:DGATeway

Function	Sets/queries the LAN IP router/gateway address for the test set.
Setting	Range: 15 characters formatted as follows: A.B.C.D where A= 0 to 223 B,C,D = 0 to 255 (no embedded spaces), blank field
Query	Range: 15 characters formatted as follows: A.B.C.D where A,B,C,D = 0 to 255 (no embedded spaces). blank field
Factory setting	blank field, (this parameter is not affected by any reset operation)
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:COMMUNICATE:LAN:SELF:DGATEWAY '130.2.6.200'"</pre>	

SYSTEM:COMMunicate:LAN[:SELF]:SMASK

Function	<p>Sets/queries the subnet mask of the test set based on the LAN IP address selected. The subnet mask changes according to the value of A used for the LAN IP address.</p> <p>If A is less than or equal to 127, the subnet mask is 255.0.0.0.</p> <p>If A is greater than 127 and less or equal to 191, the subnet mask is 222.255.0.0.</p> <p>If A is grater than 191, the subnet mask is 255.255.255.0.</p> <p>If the LAN address is changed the subnet mask should be checked to insure that it is set to the proper class for that LAN address.</p>
Setting	Range: 15 characters formatted as follows: A.B.C.D where A,B,C,D are between = 0 to 255 (no embedded spaces)
Query	Range: 15 characters formatted as follows: A.B.C.D where A,B,C,D are between = 0 to 255 (no embedded spaces)
Factory setting	0.0.0.0 (this parameter is not affected by any reset operation and can only be changed by direct user access)
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre>OUTPUT 714;"SYSTEM:COMMUNICATE:LAN:SELF:SMASK '255.2.6.200'"</pre>	

Related Topics

[“Configuring the Test Set’s GPIB” on page 504](#)

[“Configuring the Test Set’s LAN” on page 502](#)

SYSTem:CONFIgure:INFormation:HARDware:VERBoSe?

SYSTem:CONFIgure:INFormation:HARDware:VERBoSe?

[“Diagram Conventions” on page 168](#)

SYSTem:CONFIgure:INFormation:HARDware:VERBoSe?

Function	Query the manufacturer, model number, model number of the test application running, serial number, revision, board ID, and cal file information. The information provided by the query represents the configuration that existed when the test set was powered up.
*RST Setting	Resets have no effect on this information. The information is gathered during the power up cycle.
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:CONFIGURE:INFORMATION:HARDWARE:VERBOSE?" !Queries system hardware.	

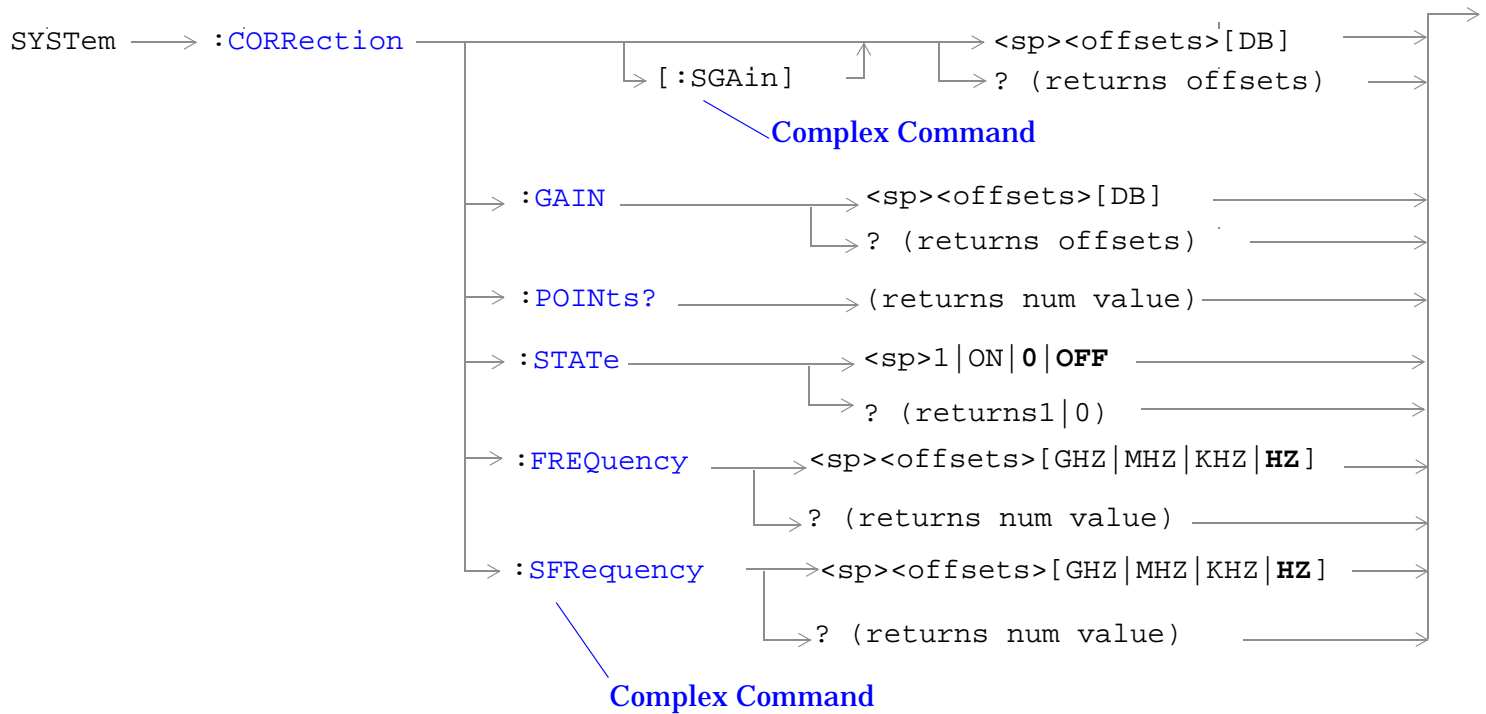
Related Topics

[“Hardware Configuration Report” on page 493](#)

[“SYSTem:CURRent:TA” on page 399](#)

[“Obtaining Identification Information \(*IDN\)” on page 492](#)

SYSTem:CORRection



“Diagram Conventions” on page 168

SYSTem:CORRection:[:SGain]

Function	<p>Sets/queries up to 20 comma-separated amplitude offset values in dB. This command sets the state to On.</p> <p>See “Amplitude Offset” on page 47.</p> <p>The units, dB, are optional. If no units are specified then units default to dB.</p> <p>Sending a null list (no values) sets the state of all offsets to Off.</p>
Setting	<p>Range: 0 to 20 values between -100 to +100</p> <p>Resolution: 0.01</p>
Query	<p>Range: 1 to 20 values between -100 to +100, and NAN (9.91E+37)</p> <p>Resolution: 0.01</p>
Factory Setting	<p>Offsets 1 through 20, are set to 0.00 dB, state is set to Off</p>
Requirements	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:CORRECTION:SGAIN -2.55,-3.12,-3.68,-4.23,-4.74,-5.3" !A complex command that sets up to 20 comma separated offsets !and sets the state to On for the frequencies, offsets and !RF IN/OUT Amplitude Offset State OUTPUT 714;"SYSTEM:CORRECTION:SGAIN" !Sets the state for all frequencies and offsets to Off </pre>	

SYSTem:CORRection:FREQuency

Function	<p>Sets/queries up to 20 comma-separated frequency values in MHz. Each frequency value corresponds with a gain setting. See "SYSTem:CORRection:GAIN" .</p> <p>The units, (GHz, MHz, kHz, Hz) are optional. If no units are specified, units default to Hz. See "Amplitude Offset" on page 47.</p> <p>Sending a null list (no values) sets the state of all frequencies to Off.</p>
Setting	<p>Range: 0 to 20 comma separated values ranging from 292.5 MHz to 2700 MHz</p> <p>Resolution: 1 Hz</p>
Query	<p>Range: 1 to 20 comma separated values ranging from 292.5 MHz to 2700 MHz, and NAN (9.91E+37)</p> <p>Resolution: 1 HZ</p>
Factory Setting	<ol style="list-style-type: none"> 1. 800.00 MHz Off 2. 810.00 MHz Off 3. 820.00 MHz Off 4. 830.00 MHz Off 5. 840.00 MHz Off 6. 850.00 MHz Off 7. 860.00 MHz Off 8. 870.00 MHz Off 9. 880.00 MHz Off 10. 890.00 MHz Off 11. 900.00 MHz Off 12. 910.00 MHz Off 13. 920.00 MHz Off 14. 930.00 MHz Off 15. 940.00 MHz Off 16. 950.00 MHz Off 17. 960.00 MHz Off 18. 970.00 MHz Off 19. 980.00 MHz Off 20. 990.00 MHz Off
Requirements	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:CORRECTION:FREQUENCY 1784.8 MHZ,1879.8 MHZ" !Sets up to 20 comma separated frequencies OUTPUT 714;"SYSTEM:CORRECTION:FREQUENCY" !Sets the state for all frequencies and offsets to Off </pre>	

SYSTem:CORRection:GAIN

Function	<p>Sets/queries the up to 20 comma separated offset gain values in units of dB. Each gain value corresponds with a frequency setting. See “SYSTem:CORRection:FREQuency” .</p> <p>See “Amplitude Offset” on page 47.</p> <p>The units, dB, are optional. If no units are specified, units default to dB.</p> <p>Sending a null list (no values) sets the state of all offsets to Off.</p>
Setting	<p>Range: 0 to 20 values between -100 to +100</p> <p>Resolution: 0.01</p>
Query	<p>Range: 1 to 20 values between -100 to +100, and NAN (9.91E+37)</p> <p>Resolution: 0.01</p>
Factory Setting	<p>Offsets 1 through 20, are set to 0.00 dB, state is set to off</p>
Requirements	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:CORRECTION:GAIN -3.12,-3.68,-4.23" !Sets up to 20 comma separated offset values. OUTPUT 714;"SYSTEM:CORRECTION:GAIN" !Sets the state for all frequencies and offsets to Off. </pre>	

SYSTem:CORRection:POINTs

Function	<p>Query returns the number of offsets that are in their On state when the RF IN/OUT Amplitude Offset State is also set to On.</p> <p>See “Amplitude Offset” on page 47.</p>
Query	<p>Range: 1 to 20, and NAN (9.91E+37)</p> <p>Resolution: 1</p>
Requirements	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:CORRECTION:POINTS?" !Returns the number of frequencies and offsets with their state set to On. </pre>	

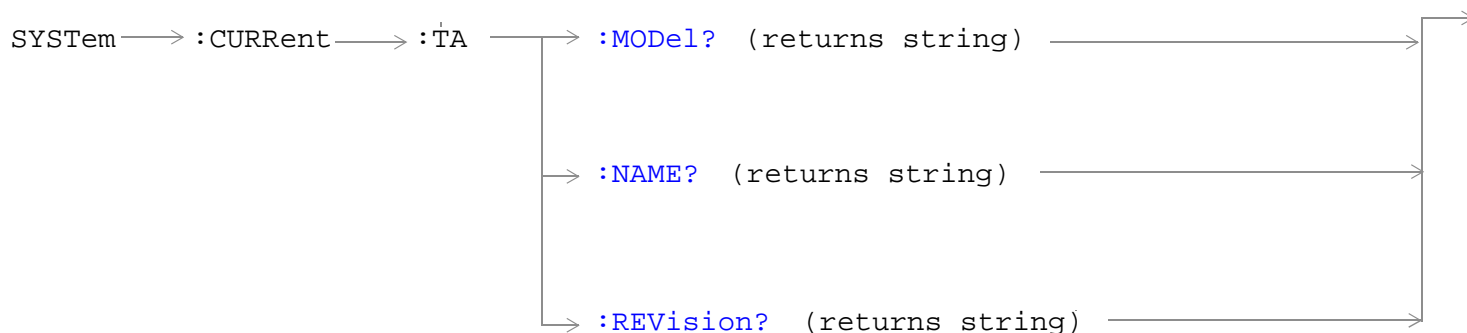
SYSTEM:CORRection:SFRequency

Function	<p>Sets/queries up to 20 comma separated frequency values in MHz. This command sets the state to On.</p> <p>The units (GHz, MHz, kHz, Hz) are optional. If no units are specified, units default to MHz.</p> <p>See "Amplitude Offset" on page 47.</p> <p>Sending a null list (no values) sets the state of all frequencies to Off.</p>
Setting	<p>Range: 0 to 20 comma separated values from 292.5 MHz to 2700 MHz</p> <p>Resolution: 1 Hz</p>
Query	<p>Range: 1 to 20 comma separated values from 292.5 MHz to 2700 MHz, and NAN (9.91E+37)</p> <p>Resolution: 1 HZ</p>
Factory Setting	<ol style="list-style-type: none"> 1. 800.00 MHz Off 2. 810.00 MHz Off 3. 820.00 MHz Off 4. 830.00 MHz Off 5. 840.00 MHz Off 6. 850.00 MHz Off 7. 860.00 MHz Off 8. 870.00 MHz Off 9. 880.00 MHz Off 10. 890.00 MHz Off 11. 900.00 MHz Off 12. 910.00 MHz Off 13. 920.00 MHz Off 14. 930.00 MHz Off 15. 940.00 MHz Off 16. 950.00 MHz Off 17. 960.00 MHz Off 18. 970.00 MHz Off 19. 980.00 MHz Off 20. 990.00 MHz Off
Requirements	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:CORRECTION:SFREQUENCY 1710.2 MHz,1805.2 MHz,1784.8 MHz,1879.8 MHz" !Sets up to 20 comma separated frequencies and sets the state to On for the frequency, !offset, and RF IN/OUT Amplitude Offset State OUTPUT 714;"SYSTEM:CORRECTION:SFREQUENCY" !Sets the state for all frequencies and offsets to Off </pre>	

SYSTem:CORRection:STATe

<p>Function</p>	<p>Sets/queries the RF IN/OUT Amplitude Offset State. The state must be On before any of the offsets are active regardless of the state for any of the frequencies or offsets.</p> <p>When the RF IN/OUT Amplitude Offset State is On, the Instrument Status Area will indicate "Offset" regardless of the state for any of the frequencies or offsets.</p> <p>Setting any of the frequency or offset states to On will set the RF IN/OUT Amplitude Offset State to On.</p> <p>See "Amplitude Offset" on page 47.</p>
<p>Setting</p>	<p>0 OFF 1 ON</p>
<p>Query</p>	<p>0 1</p>
<p>Factory Setting</p>	<p>0 (off)</p>
<p>Requirements</p>	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:CORRECTION:STATE ON" !Sets the RF IN/OUT !Amplitude Offset State to On </pre>	

SYSTem:CURRent:TA



“Diagram Conventions” on page 168

SYSTem:CURRent:TA:MODEl?

Function	Query the model number of the test application running. Printable ASCII characters up to a 15 character string.
Query	Range: ASCII codes 32 - 126 decimal excluding comma and semicolon
*RST Setting	non volatile, read from the test set's hard disk
Requirements	Test Application Revision: A.02.00 and above

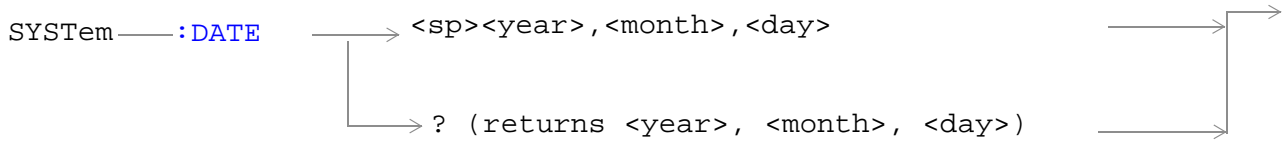
SYSTem:CURRent:TA:NAME?

Function	Query the name of the test application running. Printable ASCII characters up to a 25 character string. This command is not recommended see “SYSTem:APPLication” on page 380 .
Query	Range: ASCII codes 32 - 126 decimal excluding comma and semicolon
*RST Setting	non volatile, read from the test set's hard disk
Requirements	Test Application Revision: A.02.00 and above

SYSTem:CURRent:TA:REVision?

Function	Query the coordinated codeware revision for the test application running. Printable ASCII characters up to a 20 character string. This command is not recommended see “SYSTem:APPLication” on page 380 .
Query	Range: ASCII codes 32 - 126 decimal excluding comma and semicolon
*RST Setting	non volatile, read from the test set's hard disk.
Requirements	Test Application Revision: A.02.00 and above

SYSTEM:DATE



[“Diagram Conventions” on page 168](#)

SYSTEM:DATE

Function	Sets/queries the date.
Setting	<p>Range:</p> <ul style="list-style-type: none"> • <year> 2000 to 2099 • <month> 1 to 12 (the number 1 corresponds to January) • <day> 1 to the number of days in the month specified by the <month> parameter
Query	<p>Range:</p> <ul style="list-style-type: none"> • <year> 2000 to 2099 • <month> 1 to 12 (the number 1 corresponds to January) • <day> 1 to the number of days in the month specified by the <month> parameter
*RST Setting	This feature is not affected by instrument preset
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <p>OUTPUT 714;"SYSTEM:DATE 2001,9,27" !Sets the date to September 27,2001.</p> <p>OUTPUT 714;"SYSTEM:DATE?" !Returns "+2001,+9,+27" if the date has been set to September 27,2001.</p>	

Related Topics

[“SYSTEM:UTC:DATE”](#)

SYSTem:ERRor?

SYSTem → :ERRor? →

[“Diagram Conventions” on page 168](#)

SYSTem:ERRor?

Function	<p>Queries the contents of the Error/Event Queue. The Error/Event Queue may contain one or more messages with an error or event description.</p> <p>Manual users may view the Message Log from the SYSTEM CONFIG screen. The contents of the Error/Event Queue and the Message log may not match. Example, manual user errors are not displayed with SYSTem:ERRor? they are viewed from the Message Log. See “Error Messages” on page 456.</p>
Query	<p>Error/Event Queue</p> <ul style="list-style-type: none"> • Range: 0 to 100 messages up to 255 characters in length
Requirements	<p>Test Application Revision: A.02.00 and above</p>
<p>Programming Example</p> <pre>OUTPUT 714; "SYSTEM:ERROR?" !Queries the contents of the Error/Event Queue</pre>	

SYSTem:MEASurement:RESet

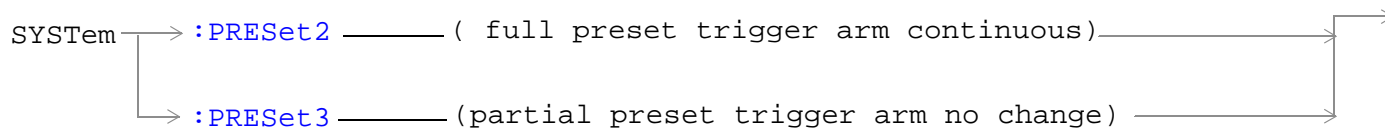


[“Diagram Conventions” on page 168](#)

SYSTem:MEASurement:RESet

Function	Sets all measurements to abort. If continuous triggering is enabled, measurements will begin a new measurement cycle.
Setting	These results are set to their default values when measurement reset occurs.
Requirements	Test Application Revision: A.02.00 and above

SYSTem:PRESet



[“Diagram Conventions” on page 168](#)

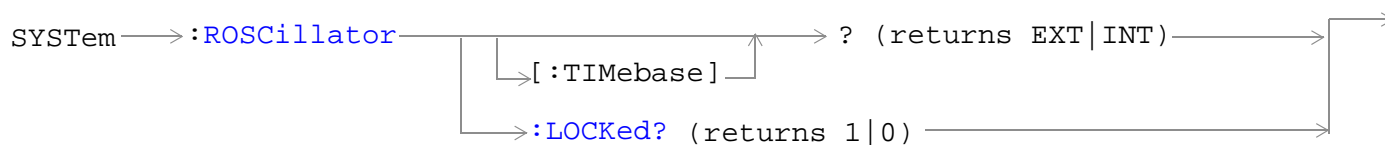
SYSTem:PRESet2

Function	<p>Performs a full preset of the test set. This is the remote equivalent of pressing the SHIFT Preset keys on the front panel of the test set.</p> <p>All parameters are set to their default values. All measurements are aborted the trigger arm is set to continuous. See “Trigger Arm (Single or Continuous) Description” on page 150.</p> <p>The *RST command will set the trigger arm to single.</p>
Related Topics	See “Full Preset” on page 117 for details about the *RST full preset.
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:PRESET2" !Full preset, trigger arm set to continuous.	

SYSTem:PRESet3

Function	<p>Performs a partial preset. This is the recommended command for users when a partial preset is needed during remote operation of the test set.</p> <p>Any call in process is disconnected and all measurements are aborted and inactivated. Measurement parameters are not changed.</p> <p>A partial preset will not modify any measurement settings including trigger arm.</p>
Related Topics	See “Partial Preset” for more details.
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:PRESET3" !Partial preset when in remote operation.	

SYSTem:ROSCillator



“Diagram Conventions” on page 168

SYSTem:ROSCillator[:TIMEbase]?

Function	<p>Queries the timebase source.</p> <p>If an external timebase is used, it must have these characteristics:</p> <ul style="list-style-type: none"> • an output level of 0 to +13 dBm • frequency of 10 MHz
Query	<p>Range:</p> <p>INT = internal source</p> <p>EXT = external source</p>
Requirements	Test Application Revision: A.02.00 and above

SYSTem:ROSCillator:LOCKed?

Function	Queries the timebase to find out if it is locked or unlocked. Returns 0 or 1.
Query	<p>Range:</p> <p>0 = unlocked</p> <p>1 = locked</p>
Requirements	Test Application Revision: A.02.00 and above

SYSTem:SYNChronized

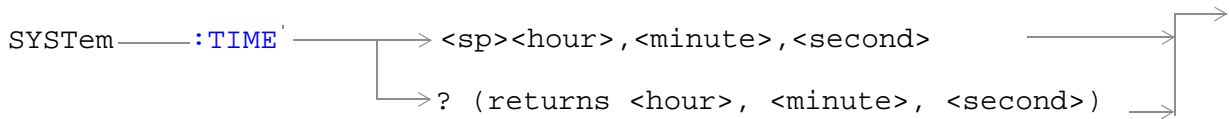
SYSTem → :SYNChronized? → (returns num value) →

[“Diagram Conventions” on page 168](#)

SYSTem:SYNChronized

Function	Sets/queries the test set to see that all prior sequential commands have completed or that all prior overlapped commands have started, indicating that the input buffer is synchronized.
Setting	Bit 12 of the status operation condition register is pulsed.
Query	Range: 1
Requirements	Test Application Revision: A.02.00 and above

SYSTem:TIME



[“Diagram Conventions” on page 168](#)

SYSTem:TIME

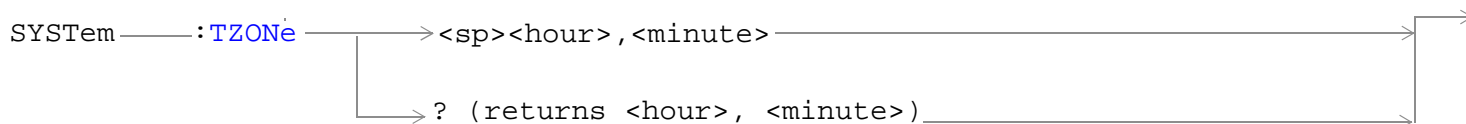
Function	<p>Sets/queries the local time of day.</p> <p>UTC time will track changes made directly to local time settings. Also, if new settings are made to UTC time, local time will track UCT time.</p> <p>Changes to time zone will cause changes to local time, but will not directly affect UTC time.</p>
Setting	<p>Range:</p> <ul style="list-style-type: none"> • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 <hr/> <p>NOTE The resolution of local time setting is minutes. A number within the parameter range must be entered for <second> but it will not affect the minute setting.</p>
Query	<p>Range:</p> <ul style="list-style-type: none"> • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 <hr/> <p>NOTE The resolution of the local time setting is minutes. The value returned for <second> will not provide useful information.</p>
*RST Setting	This feature is not affected by instrument preset
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:TIME 7,30,0" !Sets local time to 7:30 OUTPUT 714;"SYSTEM:TIME?" !Returns "+7,+30,+0" if local time has been set to 7:30. </pre>	

Related Topics

[“SYSTem:UTC\[:TIME\]”](#)

[“SYSTem:TZONE”](#)

SYSTem:TZONE



[“Diagram Conventions” on page 168](#)

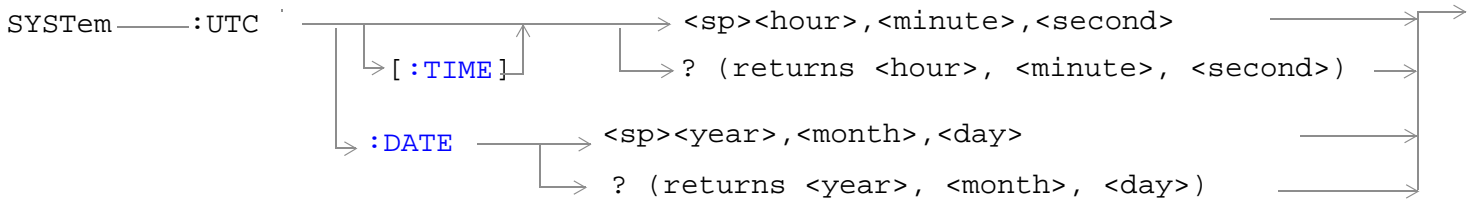
SYSTem:TZONE

Function	Sets/queries the time zone. Changes to time zone will cause changes to local time, but will not directly affect UTC time.
Setting	Range: <ul style="list-style-type: none"> • <hour> -12 to +15 • <minute> 0 to 59
Query	Range: <ul style="list-style-type: none"> • <hour> -12 to +15 • <minute> 0 to 59
*RST Setting	This feature is not affected by instrument preset
Requirements	Test Application Revision: A.02.00 and above
Programming Example OUTPUT 714;"SYSTEM:TZONE 8,0" !Sets time zone to 8 hours and 0 minutes. OUTPUT 714;"SYSTEM:TZONE?" !Returns "+8,+0" if time zone has been set to 8 hours.	

Related Topics

[“SYSTem:TIME”](#)

SYSTEM:UTC



[“Diagram Conventions” on page 168](#)

SYSTEM:UTC[:TIME]

Function	Sets/queries the Universal Coordinated Time (UTC) time of day. (UTC is also known as UCT, Zulu, and Greenwich Mean Time.) Local time will track UTC time settings. Also, if new settings are made to local time, UTC time will track local time.
Setting	<p>Range:</p> <ul style="list-style-type: none"> • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 <hr/> <p>NOTE The resolution of the UTC time setting is minutes. A number within the parameter range must be entered for <second> but it will not affect the minute setting.</p>
Query	<p>Range:</p> <ul style="list-style-type: none"> • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 <hr/> <p>NOTE The resolution of the UTC time setting is minutes. The value returned for <second> will not provide useful information.</p>
*RST Setting	This feature is not affected by instrument preset
Requirements	Test Application Revision: A.05.05 and above
<p>Programming Example</p> <pre> OUTPUT 714;"SYSTEM:UTC:TIME 7,30,0" !Sets UCT time to 7:30 OUTPUT 714;"SYSTEM:UTC:TIME?" !Returns "+7,+30,+0" if UTC time has been set to 7:30. </pre>	

SYSTem:UTC:DATE

Function	Sets/queries the Universal Coordinated Time (UTC) date. (UTC is also known as UCT, Zulu, and Greenwich Mean Time.)
Setting	<p>Range:</p> <ul style="list-style-type: none"> • <year> 2000 to 2099 • <month> 1 to 12 (the number 1 corresponds to January) • <day> 1 to the number of days in the month specified by the <month> parameter
Query	<p>Range:</p> <ul style="list-style-type: none"> • <year> 2000 to 2099 • <month> 1 to 12 (the number 1 corresponds to January) • <day> 1 to the number of days in the month specified by the <month> parameter
*RST Setting	This feature is not affected by instrument preset
Requirements	Test Application Revision: A.02.00 and above
<p>Programming Example</p> <p>OUTPUT 714;"SYSTEM:UTC:DATE 2001,9,27" !Sets the UTC date to September 27,2001.</p> <p>OUTPUT 714;"SYSTEM:UTC:DATE? !Returns "+2001,+9,+27" if the UTC date has been set to September 27,2001.</p>	

Related Topics

["SYSTem:DATE"](#)

["SYSTem:TIME"](#)

IEEE 488.2 Common Commands

Description

***CLS**

The *CLS, clear status command, is defined in “IEEE Std 488.2-1992”, 10.3. This command will also clear and close the error message screen on the test set’s display.

***ESE**

The *ESE, standard event status enable command, is defined in “IEEE Std 488.2-1992”, 10.10.

***ESE?**

The *ESE?, standard event status enable query, is defined in “IEEE Std 488.2-1992”, 10.11.

***ESR?**

The *ESR?, standard event status register query, is defined in “IEEE Std 488.2-1992”, 10.12.

***IDN?**

The *IDN?, identification query, is defined in “IEEE Std 488.2-1992”, 10.14. *IDN? is used to retrieve information about the test set in ASCII format.

*IDN?, returns ASCII codes 32 through 126 excluding comma and semicolon in four comma separated fields. Field 1 returns the manufacturer, field 2 returns the instrument model number, field 3 returns the serial number, field 4 returns 0.

***OPC**

The *OPC, operation complete command, is defined in “IEEE 488.2-1992”, 10.18. *OPC causes the test set to continuously sense the No Operation Pending flag. When the No Operation Pending flag becomes TRUE, the OPC event bit in the standard event status register (ESR) is set to indicate that the state of all pending operations is completed. The *OPC common command is not recommended for use as an overlapped command.

***OPC?**

The *OPC?, operation complete query, is defined in “IEEE Std 488.2-1992”, 10.19. The *OPC? query allows synchronization between the controller and the test set using either the message available (MAV) bit in the status byte, or a read of the output OPC?. The *OPC? query does not effect the OPC event bit in the Standard Event Status Register (ESR). The *OPC? common command is not recommended for use as an overlapped command.

***OPT?**

The *OPT?, option identification query, is defined in “IEEE Std 488.2-1992”, 10.20. Each option will have a unique name, that name will be returned with the query.

***RST**

The *RST, full preset command, is defined in “IEEE Std 488.2-1992”, 10.32. *RST is the recommended command when performing a full preset on the test set. A *RST restores the majority of settings to their default values.

- *RST sets trigger arm to single
- PRESet2 sets trigger arm to continuous

***SRE**

The *SRE, service request enable command, is defined in “IEEE Std 488.2-1992”, 10.34. The parameter range for this command is 0 through 255.

***SRE?**

The *SRE?, service request enable query, is defined in “IEEE Std 488.2-1992”, 10.35. Values returned by this query range from 0 through 255.

***STB?**

The *STB?, read status byte query, is defined in “IEEE Std 488.2-1992”, 10.36. Values returned by this query range from 0 through 255.

***WAI**

The *WAI, wait-to-continue command, is defined in “IEEE Std 488.2-1992”, 10.39. The *WAI command prevents the test set from executing any further commands or queries until all pending operation flags are false. The *WAI common command is not recommended for use as an overlapped command.

See also

[“Obtaining Identification Information \(*IDN\)”](#)

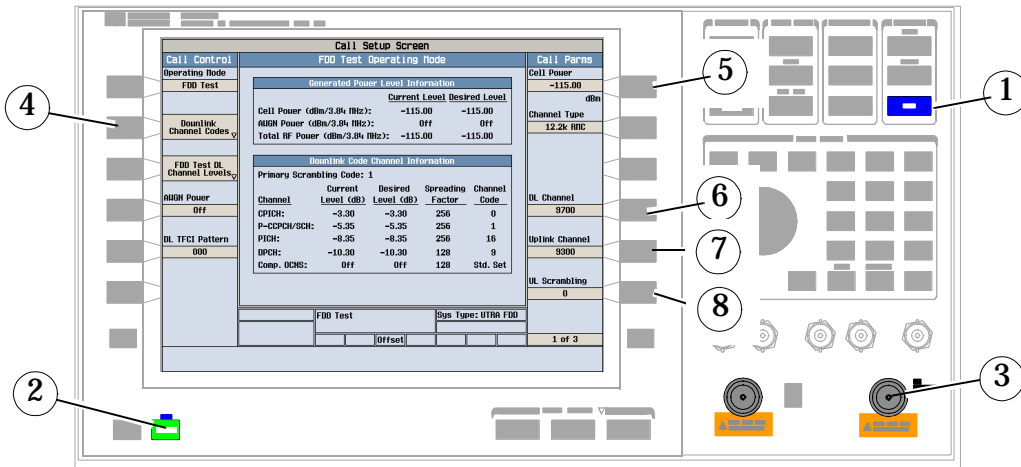
[“Preset Descriptions”](#)

Manual Operation

Making Measurements on a Mobile in FDD Test Mode

FDD Test operating mode does not provide call processing. This requires you to match the test set and UE (mobile station) test mode configurations. You must manually set the UE to transmit a 12.2 kbps reference measurement channel (RMC) on the uplink that will be measured by the test set.

A. Synchronizing the UE to the test set.

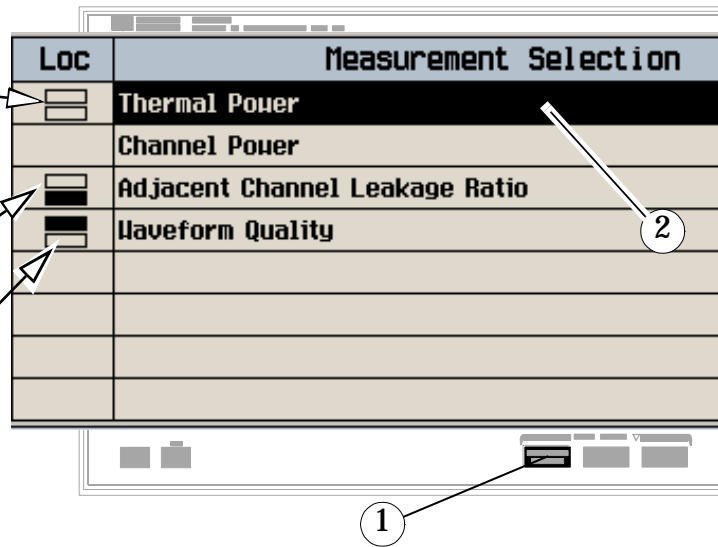


1. Press the blue **SHIFT** key.
2. Press the green **PRESET** key.
3. Connect the mobile station to the test set.
4. Press the Downlink Channel Codes (**F2**) key, and set the channel codes to match the mobile station's test mode settings.
5. Press the Cell Power (**F7**) key, and set the desired level of the downlink signal.
6. Press the DL Channel (**F10**) key, and enter the downlink channel number.
7. Press the Uplink Channel (**F11**) key, and enter the uplink channel number.
8. Press the UL Scrambling (**F12**) key, and set the uplink scrambling code to match your mobile station's uplink scrambling code.
9. Set the mobile station to transmit the uplink 12.2 kbps RMC.

B. Select measurements.

The gray boxes indicate that the measurement is being made, but the results are not being displayed.

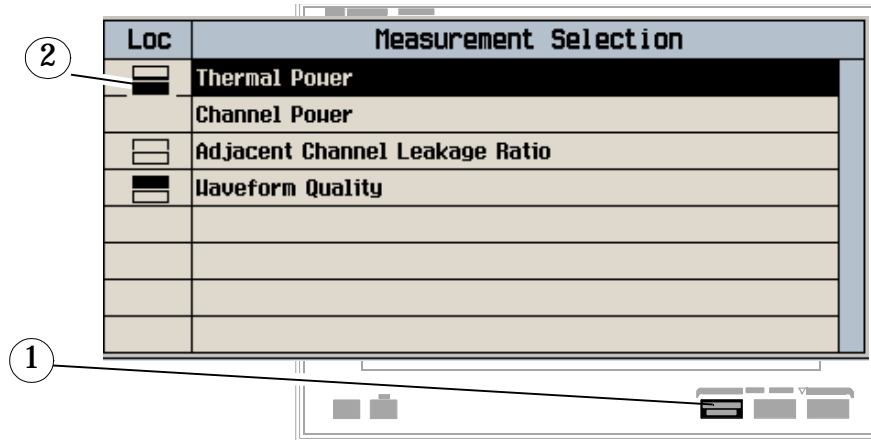
These black boxes indicate that adjacent channel leakage ratio measurement results are being displayed in the lower measurement window, and that waveform quality measurement results are being displayed in the upper measurement window.



1. Press the **Measurement selection** key.
2. Highlight a measurement and press the knob.
3. Repeat steps 1 and 2 to add measurements.

How Do I Change the Measurement Setup?

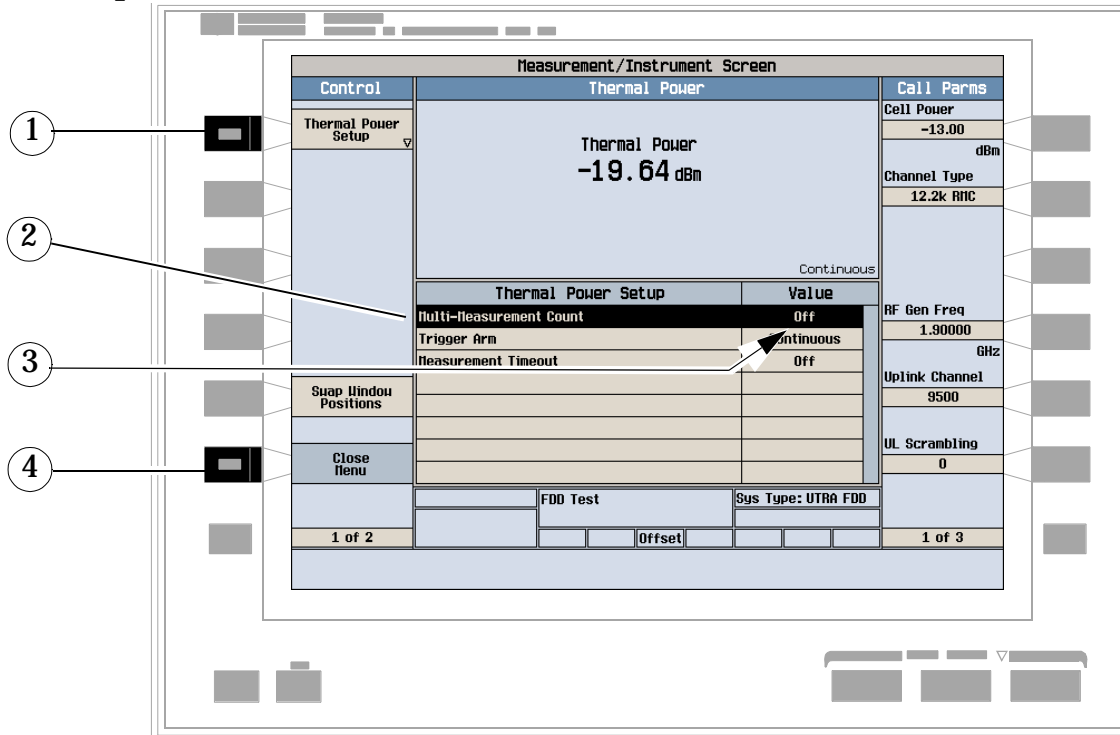
A. Select a measurement.



1. Press the **Measurement selection** key.
2. Highlight a measurement to set up and press the knob.

How Do I Change the Measurement Setup?

B. Set up the measurement.

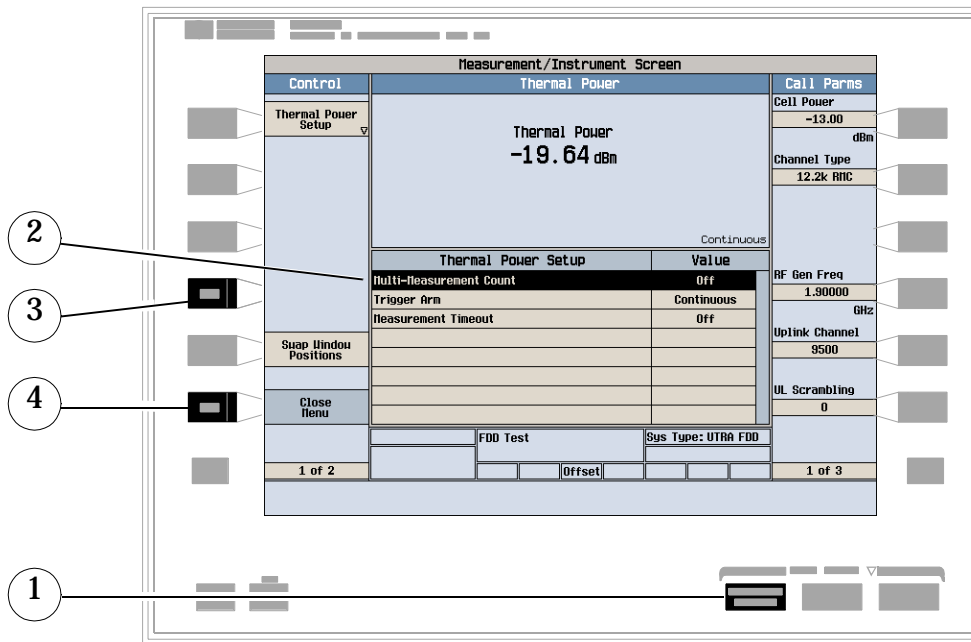


1. Press the measurement's setup key (F1).
2. Highlight a parameter and press the knob.
3. Enter a value or selection and press the knob.

Note: For statistical measurement results, change the Multi-Measurement Count parameter from Off to a number >1.

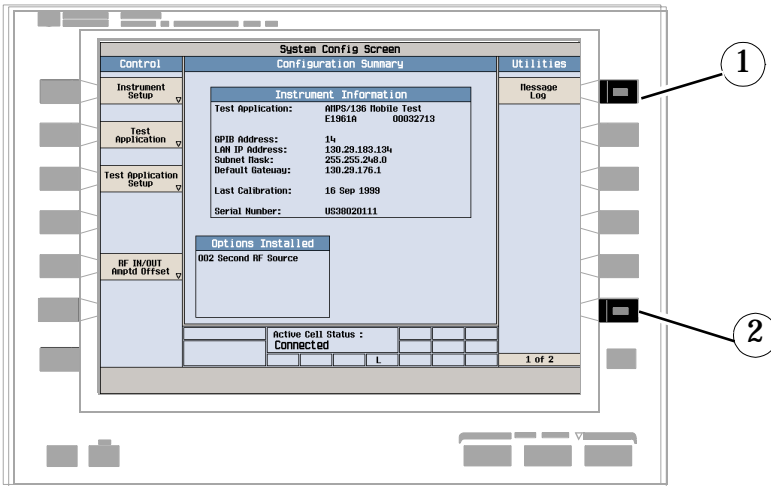
4. Press the Close Menu (F6) key.

How Do I Turn Off a Measurement?



1. Press the **Measurement** selection key.
2. Highlight the measurement you want to turn off.
3. Press the **Close Measurement (F4)** key.
4. Press the **Close Menu (F6)** key.

C. Check the message log.



1. Press the Message Log (F7) key and view the message log.
2. Press the Return (F12) key.

WCDMA Measurements Using FDD Test Operating Mode

The following step-by-step procedures explain how to perform specific measurements available on the WCDMA Test Application while using FDD Test operating mode.

FDD Test operating mode requires manual synchronization of the test set and the mobile station before the mobile station can generate an uplink signal that can be measured in the following procedures. See [“Making Measurements on a Mobile in FDD Test Mode”](#).

Detailed descriptions for each measurement and the FDD Test operating mode are provided in the *Reference* information on the documentation CD-ROM and at the Agilent 8960 support website (www.agilent.com/find/8960support).

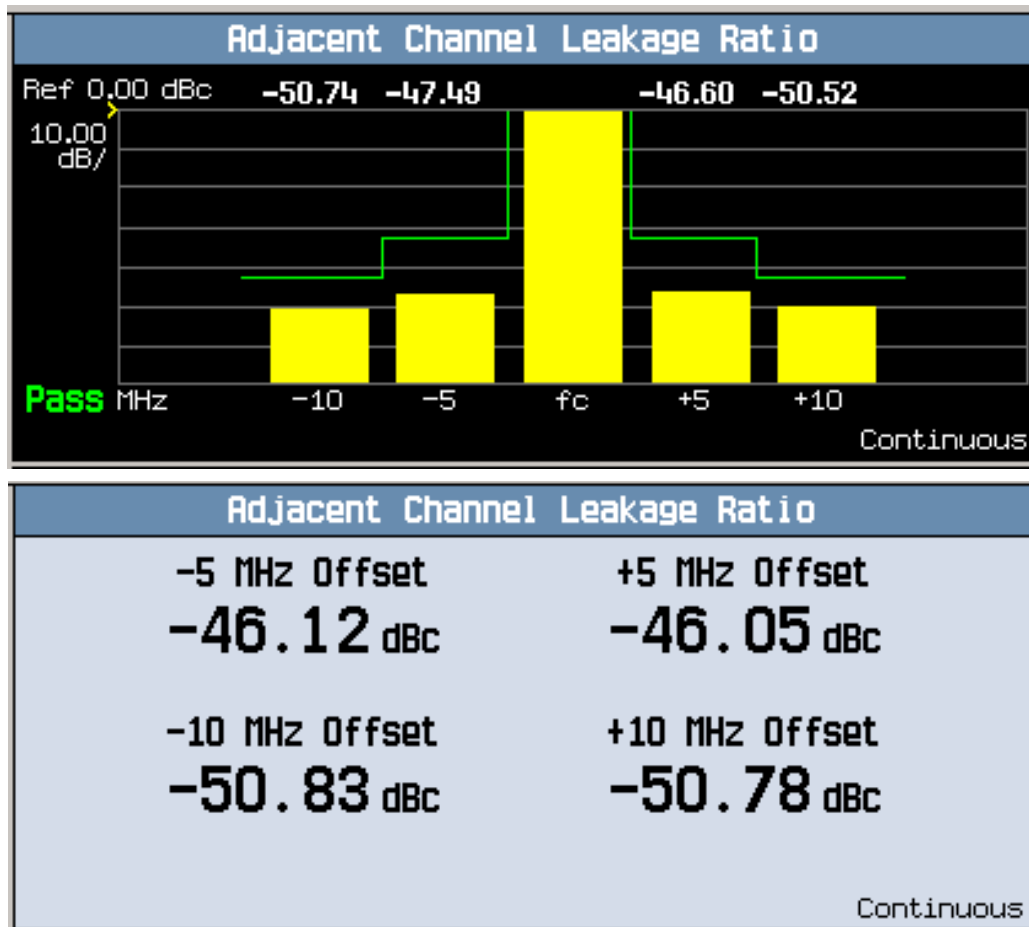
Setup parameters for each measurement are assumed to be set to their default (full preset) values unless otherwise stated.

The following measurement procedures are provided:

- [“Measuring Adjacent Channel Leakage Ratio” on page 423](#)
- [“Measuring Channel Power” on page 424](#)
- [“Measuring Loopback Bit Error Ratio” on page 425](#)
- [“Measuring Thermal Power” on page 426](#)
- [“Measuring Waveform Quality” on page 427](#)

Measuring Adjacent Channel Leakage Ratio

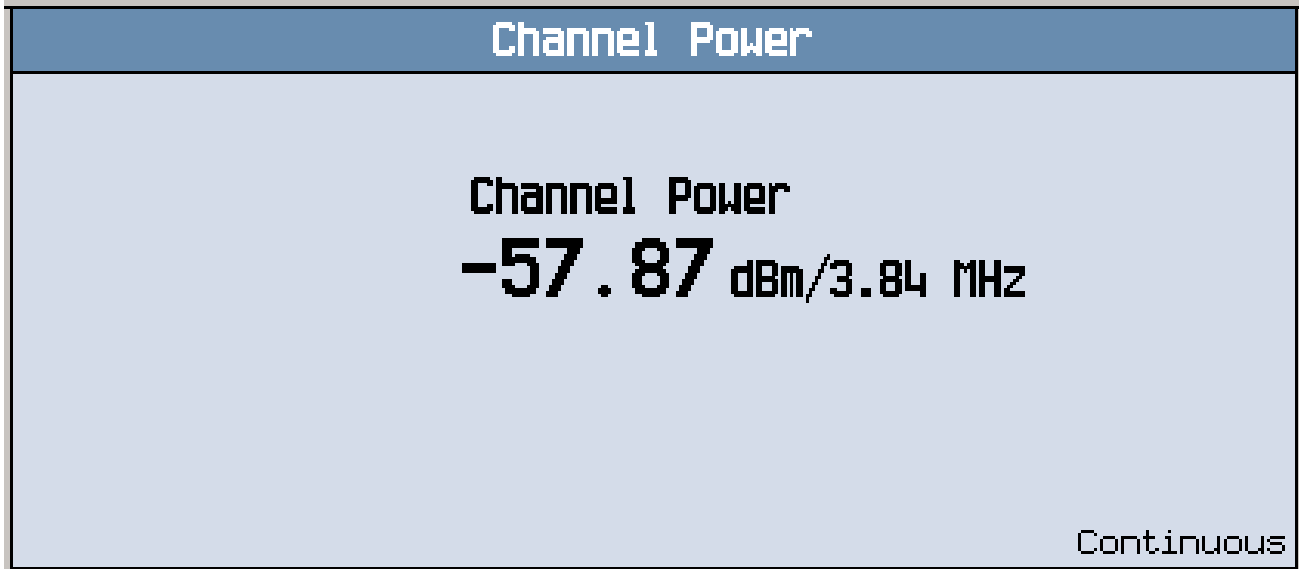
1. Configure the mobile station to generate a 12.2 kbps reference measurement channel (RMC) uplink signal on the correct frequency using the test set's FDD Test operating mode.
2. Press the **Measurement selection** key.
3. Select the Adjacent Channel Leakage Ratio measurement.
4. Press the ACLR Setup (**F1**) key.
5. Set the measurement parameters as needed for your measurement situation, such as turning the measurements on or off for the different frequency offsets.
6. Press the Change View (**F2**) key to display the measurement results in either graphical or numeric format.
7. If using the graphical display, press Graph Limits (**F5**) to enter the pass/fail measurement limit for each of the four frequency offsets (shown in the graphical measurements example below as the thin lines above each measurement).



Typical adjacent channel leakage ratio results using graphical and numeric format.

Measuring Channel Power

1. Configure the mobile station to generate a 12.2 kbps reference measurement channel (RMC) uplink signal on the correct frequency using the test set's FDD Test operating mode.
2. Press the **Measurement selection** key.
3. Select the Channel Power measurement.
4. Press the Channel Power Setup (**F1**) key.
5. Set the measurement parameters as needed for your measurement situation.



A typical channel power measurement result is shown above.

Measuring Loopback Bit Error Ratio

1. Configure the mobile station to operate in loopback test mode 1 so that it re-transmits the dedicated traffic channel (DTCH) data it decoded from the test set's 12.2 kbps reference measurement channel downlink.
2. Press the **Measurement selection** key.
3. Select the **Loopback BER** measurement.
4. Press the **Bit Error Setup (F1)** key.
5. Set the measurement parameters as needed for your measurement situation.

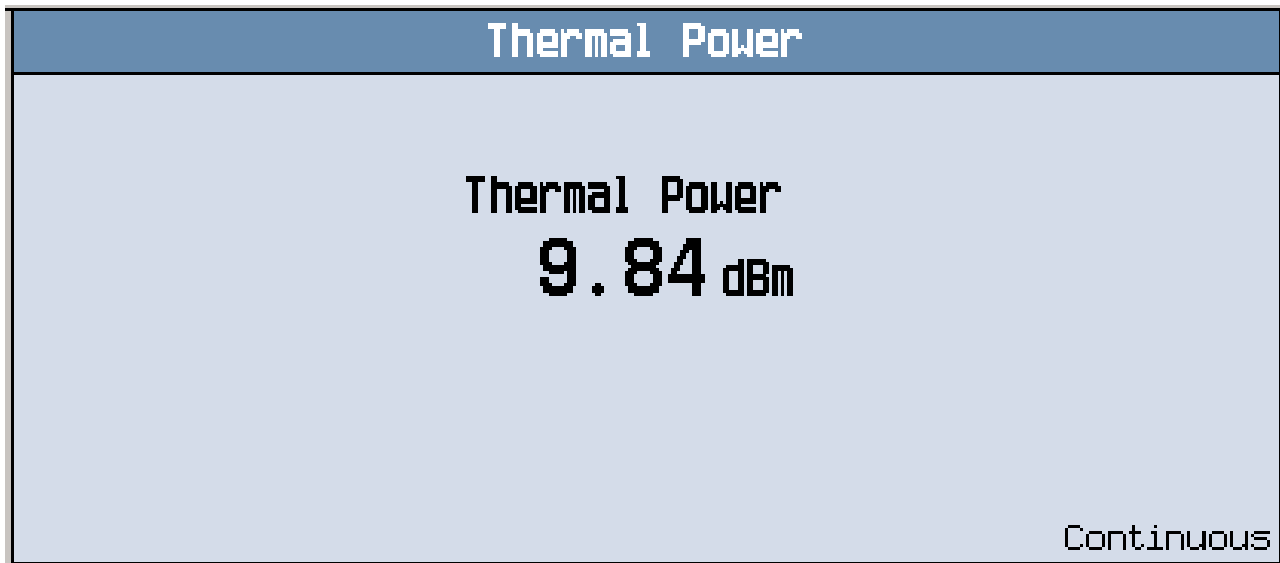
Observe how reducing the cell power to low levels causes the bit error ratio to increase.

Loopback BER		Control Parms
Bit Error Ratio 6.381% Bit Error Count: 647		Cell Power
		-106.70
10000 / 10000		dBm/3.84 MHz
Continuous		

To see how low levels of cell power into the mobile affect the bit error ratio, press **Cell Power (F7)** and slowly reduce the level. With the level into the UE set to -106.70 dBm/3.84 MHz, the example above indicates a failed BER value (the 3GPP standard specifies a BER of no more than 0.1% at this input level).

Measuring Thermal Power

1. Configure the mobile station to generate a 12.2 kbps reference measurement channel (RMC) uplink signal using the test set's FDD Test operating mode.
2. Press the **Measurement selection** key.
3. Select the Thermal Power measurement.
4. Press the Thermal Power Setup (**F1**) key.
5. Set the measurement parameters as needed for your measurement situation.



A typical thermal power measurement result is shown above.

Measuring Waveform Quality

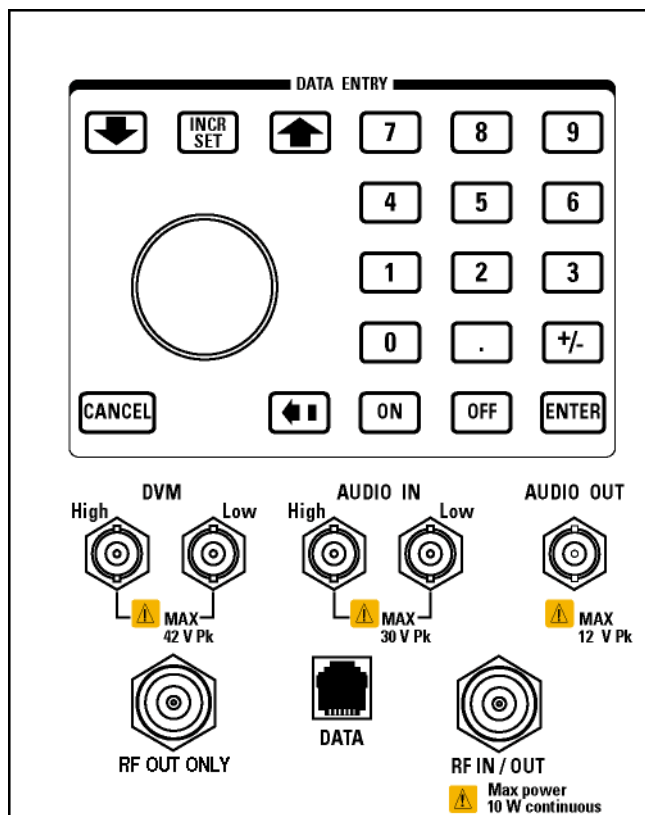
1. With the test set in FDD Test operating mode, configure the mobile station to generate a 12.2 kbps reference measurement channel (RMC) uplink signal on the correct frequency while synchronized to the test set.
2. Press the **Measurement selection** key.
3. Select the **Waveform Quality** measurement.
4. Press the **WWQ Setup (F1)** key.
5. Set the measurement parameters as needed for your measurement situation.

Waveform Quality	
EVM	Frequency Error
2.39 %	-1.23 Hz
Origin Offset:	-53.00 dB
Phase Error:	0.84 °
Magnitude Error:	1.88 %
Single	

Typical waveform quality results are shown above.

Front Panel Connectors

Description



AUDIO IN

The input to the audio analyzer is a floating input differential amplifier. Both the AUDIO IN High and AUDIO IN Low BNC connectors should be connected to provide noise immunity. Refer to the technical specifications for more information.

AUDIO OUT

This BNC connector accesses to the test set's audio generator. Refer to the technical specifications for more information.

DATA

This RJ-45 connector provides front panel access to the rear panel LAN connection. This connector is used for downloading firmware upgrades, or new test applications into the test set. No other types of communication are possible with the LAN port.

The the DATA connector on the front panel is connected internally to the ETHERNET TO FRONT PANEL connector on the rear panel. In order to use the front panel DATA connector, connect the rear panel LAN PORT, to the rear panel ETHERNET TO FRONT PANEL connector with the LAN jumper cable.

The LAN jumper cable, part number E5515-61160, is supplied with the test set.

DVM

Not functional for this release.

RF IN/OUT

This Type-N connector is the default path for all RF signals out of the test set, and is *always* used as the RF input. Refer to the technical specifications for more information. See also [“RF OUT ONLY”](#) .

RF OUT ONLY

NOTE This port is usable only with the E1962B and E1963A test applications.

This Type-N connector is an optional path for all RF signals out of the test set. Front panel selection of this port is provided by the `RF Output Port (F6)` control on the System Config screen, and by the `RFGenerator:OUTPut[:DESTination] IO/OUT` command. The same amplitude offsets and output power settings are used for either selected port (RF IN/OUT or RF OUT ONLY). Refer to the technical specifications for more information.

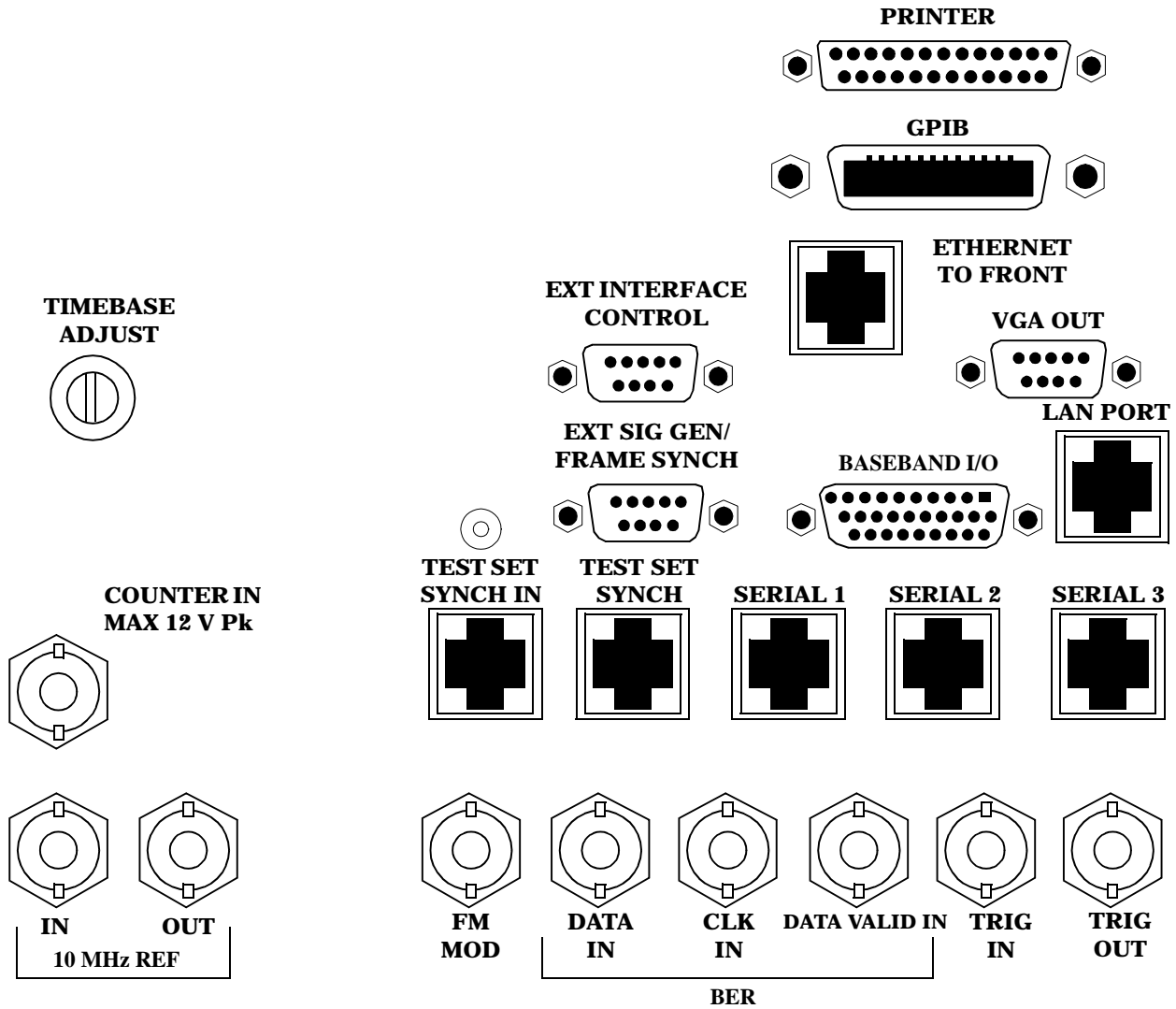
Related Topics

[“RFGenerator Subsystem”](#) (RF OUT ONLY control)

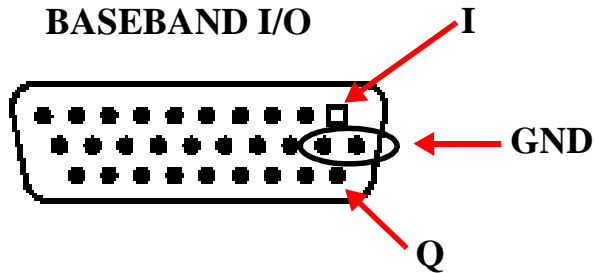
[“Amplitude Offset”](#) (RF amplitude offsets)

Rear Panel Connectors

Description



BASEBAND I/O



Four pins are functional on this connector:

- I channel
- Q channel
- Ground
- Ground

CLK IN

Not functional for this release.

COUNTER IN

Not functional for this release.

DATA IN

Not functional for this release.

DATA VALID IN

Not functional for this release.

ETHERNET TO FRONT PANEL

This RJ-45 connector is used with a separate LAN jumper cable to connect the front panel DATA connector to the rear panel LAN PORT.

The the DATA connector on the front panel is connected internally to the ETHERNET TO FRONT PANEL connector on the rear panel. In order to use the front panel DATA connector the user must connect the rear panel LAN PORT, to the rear panel ETHERNET TO FRONT PANEL connector with the LAN jumper cable.

The LAN jumper cable, part number E5515-61160, is supplied with the test set.

EXT INTERFACE CONTROL

Not functional for this release.

EXT SIG GEN/FRAME SYNCH

Not functional for this release.

FM MOD IN

This BNC connector let's you use an external signal to frequency modulate the test set's RF generator. It has a fixed sensitivity of 20 KHz/volt, and a frequency range of 100Hz to 20 KHz.

GPIB

The GPIB connector allows test set control with compatible devices.

LAN PORT

This RJ-45 connector provides connection for down loading firmware upgrades, or new test applications into the test set. No other types of communication are possible with the LAN port.

PRINTER

Not functional for this release.

SERIAL 1

Not functional for this release.

SERIAL 2

Not functional for this release.

SERIAL 3

Not functional for this release.

TEST SET SYNCH IN

Not functional for this release.

TEST SET SYNCH OUT

Not functional for this release.

TIMEBASE ADJUST

This is the timebase adjust cover, removing this screw allows access for timebase adjustment.

TRIG IN

Not functional for this release.

TRIG OUT

This BNC connector allows for synchronization of the test set to other equipment and is configured by setting Frame Trigger Parameters.

VGA OUT

This DB-15 connector allows the user to simultaneously route the test set's display to another monitor.

10 MHZ REF IN

This BNC connector accepts an external 10 MHz timebase signal. The nominal input impedance is 50 ohm. This version of test set can only accept a 10 MHz timebase signal.

10 MHZ REF OUT

This BNC connector provides a 10 MHz timebase signal to external test equipment. The accuracy of this signal is determined by the timebase used. The nominal output impedance is 50 ohm with a typical level of 0.5 V rms.

Remote/Local Mode

Description

Remote Mode

When the test set is operated remotely, all of the keys on the front panel of the test set are disabled (except the LOCAL key and the power switch). During remote operation the test set is controlled by the Remote User Interface, (RUI).

Any open menus are be closed, and any manual entries are be aborted when the test set transitions from local mode to remote mode.

The remote annunciator (R) will appear in the Instrument Status Area of the test set's display indicating that the test set is in remote mode.

When the test set is in remote mode press the LOCAL key on the front panel in order to gain manual control.

Local Mode

During local mode all front panel keys and the knob are enabled. During local operation the test set is controlled by the Manual User Interface, (MUI).

The remote annunciator (R) is turned off when the test set is operated in local mode.

Printing Screens

Printing and Saving Screen Images

The test set's local area network (LAN) connection can be used to dump the currently-displayed screen image into a personal computer's web browser. The computer must either be connected to an existing LAN or have a LAN adapter installed that can be connected directly to the test set.

Computer Requirements for LAN Communications with the Test Set

The computer used to capture screen images from the test set must meet the following requirements:

- 10 Base-T, IEEE 802.3 compliant, ethernet network interface using TCP/IP protocol and configured to run in half-duplex mode.
- Windows 95, 98, 2000 or NT 4.0 (Windows 95, Windows 98, Windows 2000 and Windows NT 4.0 are U.S. registered trademarks of Microsoft Corporation.)

Test Set to Computer Connections

The test set's LAN connection can be made at either the rear-panel LAN PORT or at the front-panel DATA port. When using the DATA port, be sure to have the factory supplied jumper cable installed between the rear-panel LAN PORT and the ETHERNET TO FRONT PANEL port.

Connections from the test set to the computer must be made using the *correct type* of LAN cable:

- If the test set is being connected to the computer through an existing network, use a *standard* LAN cable.
- If the test set is being connected directly to the computer's LAN adapter, use a *crossover* LAN cable (such as the one shipped with the test set or with an older test application upgrade kit).

Capturing the Screen Image

1. Press the test set's **SYSTEM CONFIG** key to display the test set's LAN settings, and record the LAN IP Address for use later in this procedure.
2. Start a web browser application on your computer.
3. Display the test set screen that you want to capture.
4. Enter the following address/location into your web browser: `http://<lan address>/display.htm` where <lan address> is the LAN IP address of the *test set*.
5. Within a few seconds, the test set's screen image appears in your browser. If the image does not appear on your browser within 30 seconds, refer to ["Test Your LAN Connections and Configuration by "Pinging" the Test Set"](#) below.
6. To print the image, select `File, Print`.
7. To save the file:
 - a. Select `File`, or right-click on the image, and select `Save As` or `Save Picture As`.
 - b. Enter the desired file name and directory path for saving the image as a GIF file.

The image can now be retrieved from your directory and used as needed.

Test Your LAN Connections and Configuration by “Pinging” the Test Set

Perform this operation only if you were not successful in downloading the test set screen image into your browser.

1. Display the Command Prompt window on your computer. This is typically done in the Microsoft Windows operating system by selecting Start -> Programs -> Command Prompts.
2. At the command prompt, enter the following command: `ping <lan address>`. The <lan address> is the test set's LAN IP address. (The command prompt does not have to be at the root (c:\) level before entering the command.)

This example shows what should happen when you enter the ping command for a test set with the LAN IP address of 111.22.333.44. The test set should reply back to the Command Prompt screen indicating that data was received.

```

Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.
C:\WINNT\Profiles\caesar\Desktop>ping 111.22.333.44
Pinging 111.22.333.44 with 32 bytes of data:
Reply from 111.22.333.44: bytes=32 time<10ms TTL=63
Reply from 111.22.333.44: bytes=32 time<10ms TTL=63
Reply from 111.22.333.44: bytes=32 time<10ms TTL=63
Reply from 111.22.333.44: bytes=32 time<10ms TTL=63
C:\WINNT\Profiles\caesar\Desktop>_
    
```

Entering this command...
 should result in these messages being displayed to confirm data exchange between the test set and the computer.

3. If the message “Request Timed Out” is displayed instead of a reply from the test set, try entering the command again. If the request times out again, your LAN connections are incorrect and/or your LAN settings for the two devices do not match.

Troubleshooting LAN Connections

If your web browser did not display the test set's screen, or you could not “ping” your test set from your browser, refer to the following information to find the cause and fix the problem.

- Try Altering Connections** • If you are using the test set's front panel DATA port, make sure the jumper between the rear-panel LAN PORT and ETHERNET TO FRONT PANEL port is in place; or try connecting directly to the rear-panel LAN PORT.
- Try using a different type of LAN cable. If you were using a crossover cable, try using a standard LAN cable; if using a standard LAN cable, try using a crossover cable. If this doesn't fix the problem, be sure to replace the cable with the type recommended in “[Test Set to Computer Connections](#)” above.

Reconfigure the Computer and Test Set LAN Settings If the test set's image is still not displayed on your web browser, and the ping command still indicates that the test set is not communicating with the computer, you need to verify that the LAN settings for the computer and the test set are compatible. The following sections provide general guidelines in getting the LAN settings configured for both instruments to communicate with each other.

Perform the configuration in the following order:

1. Configure the computer's LAN settings.
2. Restart Windows on the computer to start using the new LAN configuration.
3. Configure the test set's LAN settings to work with the computer's settings. (It is important that the computer be configured and re-started before configuring the test set's LAN settings.)
4. Turn the test set off and back on to make sure it finds the computer's newly-configured LAN card on power up.

LAN Setting Guidelines

- It is highly recommended that the Subnet Mask be set to 255.255.248.0 for the test set and the computer when using a direct computer-to-test set connection.
- The first three groups of numbers for the LAN IP Address of the test set and the computer must match. Example; if the test set's LAN IP Address is set to 130.29.189.33, the computer's LAN IP address must begin with 130.29.189.

The number in the fourth group of digits in the computer's and test set's LAN IP Addresses must NOT match. Example; if the test set is set to LAN IP Address 130.29.189.33, set the computer's LAN IP Address to 130.29.183.34 (or 130.29.183.77, 130.29.183.42...- just so the last number is not also set to 33). The last entry in the IP Address must not be >254 or 0.

Changing the LAN Setting on Your Computer Network configuration procedures vary between operating systems. You may have to refer to your computer's help system, or your LAN adapter card's documentation, for assistance.

Perform the following steps to alter the network settings for most PCs using a Microsoft Windows operating system.

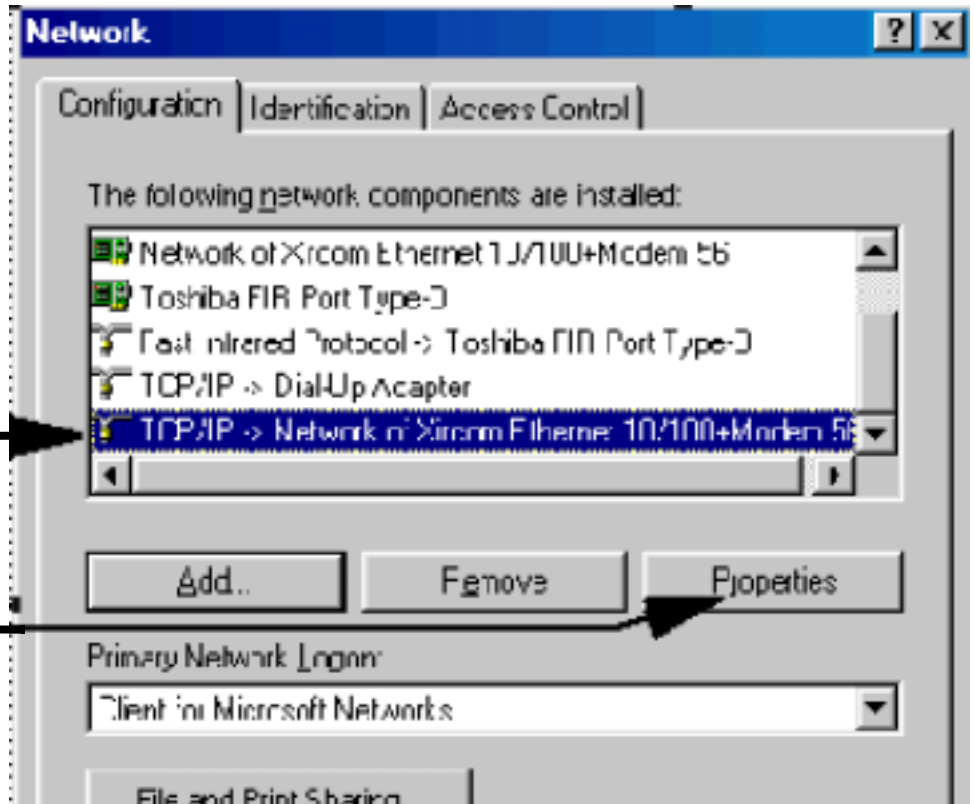
Access the Network Settings

1. Double-click on the `My Computer` icon on the Windows desk top.
2. Double-click on the `Control Panel` icon.
3. Double-click on the `Network` icon.
4. Select the `TCP/IP-> [your Ethernet network adapter]` entry from the list of components. Note: Do not select `TCP/IP Dial-Up Adapter settings` if present.
5. Select `Properties` to access the TCP/IP settings screen.

Figure 14. Accessing Your Computer's LAN Settings

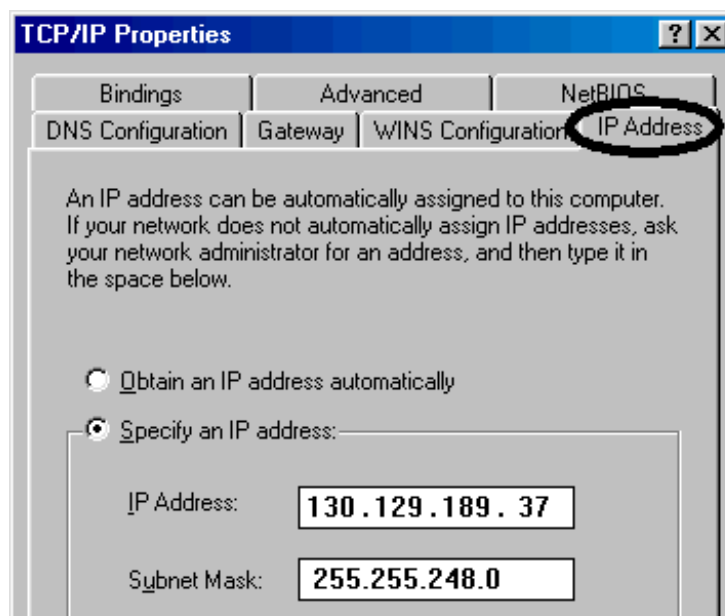
Select the entry for your Ethernet network adapter, then...

select Properties to list the TCP/IP settings for your adapter.

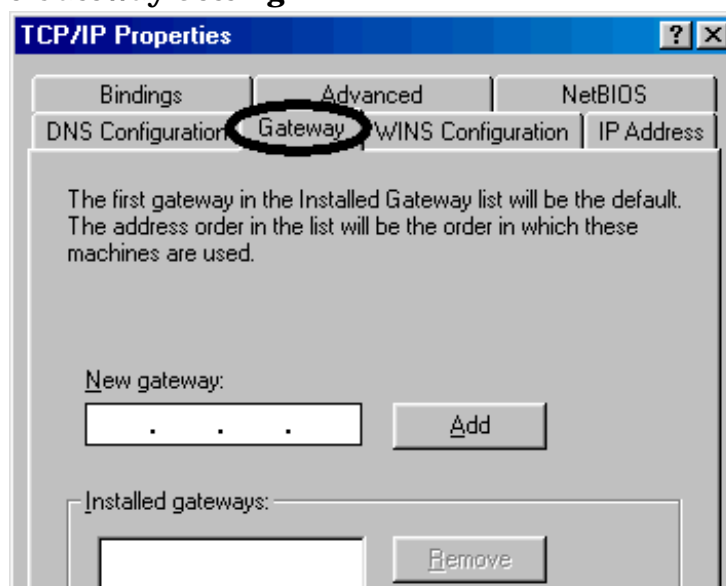


Set the IP Address and Subnet Mask

1. Select the IP Address tab on the TCP/IP Properties screen.
2. Select Specify an IP Address.
3. Enter the IP Address for the computer. Remember, the last entry in the IP Address must not be >254 or 0.
4. Enter the Subnet Mask (255.255.248.0).

Figure 15. Specifying the Computer's IP Address and Subnet Mask**Remove Any Gateway Setting**

1. Select the Gateway tab.
2. If present, remove any existing setting.
3. Click OK until you have closed the Network settings window.

Figure 16. Accessing the Gateway Setting

Restart Windows

Depending on your LAN network adapter, your computer may or may not apply the network configuration changes as they are made. It is important that you restart Windows NOW to make sure new LAN settings are in effect when you try to connect to the test set.

Changing the LAN Settings on Your Test Set 1. Press the **SYSTEM CONFIG** key on the test set to display the current LAN settings.

System Config Screen																		
Control	Configuration Summary																	
Instrument Setup ▾	<table border="1"> <thead> <tr> <th colspan="2">Instrument Information</th> </tr> </thead> <tbody> <tr> <td>Test Application:</td> <td>GSM Mobile Test E1960A A.03.01</td> </tr> <tr> <td>GPIB Address:</td> <td>20</td> </tr> <tr> <td>LAN IP Address:</td> <td>130.29.183.40</td> </tr> <tr> <td>Subnet Mask:</td> <td>255.255.255.0</td> </tr> <tr> <td>Default Gateway:</td> <td></td> </tr> <tr> <td>Last Calibration:</td> <td>10 Sep 1999</td> </tr> </tbody> </table>		Instrument Information		Test Application:	GSM Mobile Test E1960A A.03.01	GPIB Address:	20	LAN IP Address:	130.29.183.40	Subnet Mask:	255.255.255.0	Default Gateway:		Last Calibration:	10 Sep 1999		
Instrument Information																		
Test Application:	GSM Mobile Test E1960A A.03.01																	
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Default Gateway:																		
Last Calibration:	10 Sep 1999																	
External Trigger Setup ▾																		
	<table border="1"> <thead> <tr> <th>Instrument Setup</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>GPIB Address</td> <td>20</td> </tr> <tr> <td>LAN IP Address</td> <td>130.29.183.40</td> </tr> <tr> <td>Subnet Mask</td> <td>255.255.248.0</td> </tr> <tr> <td>Default Gateway</td> <td></td> </tr> <tr> <td>Display Mode</td> <td>Track</td> </tr> <tr> <td>Display Brightness</td> <td>High</td> </tr> <tr> <td>Power State</td> <td>On</td> </tr> </tbody> </table>	Instrument Setup	Value	GPIB Address	20	LAN IP Address	130.29.183.40	Subnet Mask	255.255.248.0	Default Gateway		Display Mode	Track	Display Brightness	High	Power State	On	
Instrument Setup	Value																	
GPIB Address	20																	
LAN IP Address	130.29.183.40																	
Subnet Mask	255.255.248.0																	
Default Gateway																		
Display Mode	Track																	
Display Brightness	High																	
Power State	On																	
Port Configuration ▾																		

2. Press the **F1** (Instrument Setup) key.

NOTE Changing the LAN IP Address may alter the Subnet Mask setting. Therefore, change the LAN IP Address first, then change the Subnet Mask. Also, The last entry in the IP Address must not be >254 or 0.

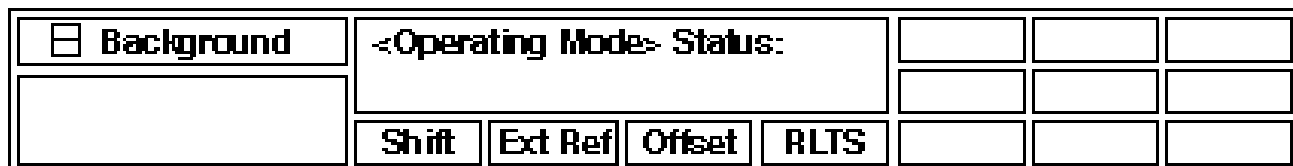
3. Turn the knob to highlight the setting you want to change.
4. Press the knob to select the setting.
5. Enter the new value using the keypad, and press the knob to complete the setting.
6. Turn the test set off and back on to start using the new settings.

Instrument Status Area

Description

The Instrument status area is found on the bottom center of the test set's display.

Figure 17. Status Area of the Test Set Display



Background

Users are able to initiate more than one measurement at a time with the test set. The test set's display will show a maximum of 2 measurements. When 3 or more measurements are initiated, or the MEASUREMENT screen is not displayed, the Background annunciator reminds you that measurements are active but not displayed.

<Operating Mode> Status

The call processing status and the operating modes are displayed in this area. This area may change (depending on the TA that is active) in order to provide TA specific information.

Shift

This annunciator indicates that the blue SHIFT key has been pressed, and that the next key you press will perform the shifted function indicated, also in blue.

Ext Ref

When a suitable external time base is connected to the rear panel 10MHz REF IN connector, this annunciator will turn on.

Int Ref

When a suitable external time base is not connected to the rear panel 10MHz REF IN connector, this annunciator will turn on.

Offset

Indicates that the Amplitude Offset state is set to On.

R L T S

This annunciator indicates the state of four different conditions of the test set:

- Remote annunciator. 'R' turns on when the test set is operated remotely.
- Listen annunciator. 'L' turns on when the test set is listening to a command.
- Talk annunciator. 'T' turns on when the test set is providing information over GPIB.
- SRQ annunciator. 'S' turns on when an SRQ is active.

Call Processing Event Synchronization

Description

Using the call processing subsystem overlapped command synchronization commands, you can query the test set to find out when an overlapped command operation is done (:DONE?, :OPC?), force the test set to not execute any more commands until an overlapped command operation has completed (:WAIT), or simply force an overlapped command to behave as a sequential command (:SEQ).

Pending Operation Flags

Associated with each overlapped command, the test set maintains a binary indicator known as a pending operation flag. A pending operation flag is set true when the operation started by the overlapped command is executing, and is set false when the operation is no longer executing.

NOTE In addition to the call processing subsystem overlapped commands, the test set also provides the measurement-related INITiate <measurement> overlapped commands.

Call Processing Subsystem Overlapped Command Synchronization Commands**Table 7. Overlapped Commands**

Command	Purpose Of Command	Example
:DONE?	Returns a 0 if the associated command's pending operation flag is true, or a 1 if it is false.	<pre> 10 OUTPUT 714; "CALL:TCH 65" 20 OUTPUT 714; "SETUP:TXP:CONT OFF" 30 OUTPUT 714; "SETUP:PFER:CONT OFF" 40 REPEAT 50 OUTPUT 714; "CALL:TCH:DONE?" 60 ENTER 714;Process_done 70 UNTIL Process_done 80 OUTPUT 714;INIT:TXP;PFER" 90 END </pre> <p>The example shown is from the E1960A GSM test application. Commands the test set to perform a traffic channel handover and execute two setup commands. After the two setup commands have finished, the :DONE? command is used to find out if the handover is finished</p>
:SEQuential	Forces an overlapped command to execute in a sequential manner. No subsequent commands will be executed until the pending operation flag for this operation is false.	<pre> OUTPUT 714; "CALL:TCH:SEQ 65" </pre> <p>The example shown is from the E1960A GSM test application. Commands the test set to perform a traffic channel handover and to not execute any more commands until the pending operation flag associated with the CALL:TCH command is false.</p>
:WAIT	Forces the test set to wait until the associated command's pending operation flag is false before executing any more commands.	<pre> 10 OUTPUT 714; "CALL:TCH 65" 20 OUTPUT 714; "SETUP:TXP:CONT OFF" 30 OUTPUT 714; "SETUP:PFER:CONT OFF" 40 OUTPUT 714; "CALL:TCH:WAIT" 50 OUTPUT 714; "INIT:TXP;PFER" 60 END </pre> <p>The example shown is from the E1960A GSM test application. Commands the test set to perform a traffic channel handover and execute two setup commands. After the two setup commands have finished, the :WAIT command is sent to prevent the test set from executing the INITiate command until the handover is finished.</p>

Table 7. Overlapped Commands

Command	Purpose Of Command	Example
:OPComplete?	Places a 1 in the test set's output queue when the associated command's pending operation flag goes false. Controlling program hangs on this query until the 1 is retrieved.	<pre> 10 OUTPUT 714; "CALL:TCH 65" 20 OUTPUT 714; "SETUP:TXP:CONT OFF" 30 OUTPUT 714; "SETUP:PFER:CONT OFF" 40 OUTPUT 714; "CALL:TCH:OPC?" 50 ENTER 714;Op_complete 60 OUTPUT 714; "INIT:TXP;PFER" 70 END </pre> <p>The example shown is from the E1960A GSM test application. Commands the test set to perform a traffic channel handover and execute two setup commands. After the two setup commands have finished, the :OPC? command is sent to hang program execution until a 1 is put in the test set's output queue, satisfying the ENTER statement and allowing program execution to continue with the INITiate command.</p>

Operating Considerations

When using the call processing subsystem overlapped command synchronization commands, check the conditions that set the operation's pending operation flag (POF) false to avoid unexpected results.

Call Processing Subsystem Overlapped Commands

Table 8. Overlapped Commands

Call Processing Command	Purpose Of Command	Pending Operation Flag (POF) is false when
CALL:ORIGinate See "CALL:ORIGinate" .	Performs a base station call origination.	The call processing state leaves the Idle state (when the operating mode is active cell), or The test set has noted this parameter change (when the operating mode is test mode).
CALL:REGister	Performs a zone-based (forced) registration.	The mobile station has responded to the registration.
CALL:CONNected:ARM[:IMMediate] See "CALL:CONNected[:STATE]" .	Arms the call control status change detector.	The call control status change detector has been disarmed. See "Connected/Idle Query" .

Related Topics

["Call Processing State Synchronization" on page 1](#)

Call Processing Event Synchronization

[“Test System Synchronization Overview” on page 160](#)

[“Measurement Event Synchronization” on page 164](#)

Troubleshooting

Adjacent Channel Leakage Ratio Troubleshooting

Possible Setup Issues

During remote operation of the adjacent channel leakage ratio measurement, you should configure the trigger arm to single. See [“SETup:WACLeakage”](#).

If the trigger arm is not set to single, the measurement may not return a result. When trigger arm is continuous, the measurement rearms itself and starts another measurement cycle; possibly interrupting the FETCh operation during remote use. See [“Measurement States”](#).

The trigger source defaults to Auto for the adjacent channel leakage ratio measurement, and tries to use protocol triggering if the mobile station (UE) is synchronized to the test set. Immediate triggering is used if the mobile station is not synchronized.

Measurement results are not affected by any amplitude offsets that are entered.

Interpreting Integrity Indicator Values

This measurement uses auto-ranging to automatically set the expected level into the test set.

If `Over Range (5)` is returned, the measured signal exceeds the expected input level or exceeds the maximum allowed input power for the test set.

If `Under Range (6)` is returned, the measured signal is below the expected input level.

See [“Integrity Indicator”](#).

AFANalyzer Troubleshooting

Possible Setup Issues

During remote operation of the Audio Analyzer, you should always set the Trigger Arm to Single. The length of time required to return a measurement over GPIB using continuous triggering varies, but is always longer than when using single triggering. Continuous triggering can also cause problems when the INITiate:DONE? query is used.

The Detector Type selected (peak or rms) also sets how Audio Level measurements are displayed; as a peak value or an rms value. When comparing returned values over GPIB to your specifications, be sure to take into account the type of detector being used.

The Expected Peak Voltage is always set in V_{peak} , regardless of the Detector Type selected, and cannot exceed $20 V_{\text{peak}}$ ($14.1 V_{\text{rms}}$).

For accurate measurements, always set all Audio Analyzer setup parameters to their proper settings for the measurement being made. The SINAD and Distortion measurements typically use different settings than the Audio Level measurement. See [“Audio Analyzer Measurement Description” on page 33](#) and [“Audio Analyzer Block Diagram” on page 35](#).

For very low level audio signals, use the 100 Hz BW BPF filter to reduce the affects of noise (see [“Audio Level Measurement Description” on page 32](#)).

For accurate Audio Frequency measurements where more than one signal may be present, use the 100 Hz BW BPF filter to isolate the desired signal (see [“Audio Level Measurement Description” on page 32](#)).

Interpreting Integrity Indicator Values

See [“Integrity Indicator” on page 153](#).

If over range (5) is returned, the input level is greater than 4.9 dB above the Expected Peak Amplitude value or the maximum input level of 20 volts peak.

If under range (6) is returned, the input level is lower than 8 dB below the Expected Peak Amplitude value.

If the signal has both over range and under range conditions, only the over range condition (5) is indicated.

Channel Power Troubleshooting

Possible Setup Issues

During remote operation of the channel power measurement you should configure the trigger arm to single. See [“SETup:WCPower”](#) .

If the trigger arm is not set to single, the measurement may not return a result. When trigger arm is continuous, the measurement rearms itself and starts another measurement cycle; possibly interrupting the FETCh operation during remote use. See [“Measurement States”](#) .

The trigger source defaults to Auto for the channel power measurement, and tries to use protocol triggering if the mobile station (UE) is synchronized to the test set. Immediate triggering is used if the mobile station is not synchronized.

RF Rise triggering should only be used when a burst is sent, such as a PRACH burst.

Autoranging is not available for this measurement. The expected input level is determined by either the MS Target Power setting, when automatic receiver control is used (default), or by the Manual Power setting when manual receiver control is selected. See [“Receiver Control”](#) .

Measurement results are affected by any amplitude offsets that are entered. See [“Amplitude Offset”](#) .

The channel power measurement value may be slightly lower than the thermal power measurement's value (typically about 0.25 dB). This is because the channel power measurement is band-limited, rejecting the additional power that may be in the uplink signal's sidebands.

Interpreting Integrity Indicator Values

If `Over Range (5)` is returned, the measured signal exceeds the expected input level or exceeds the maximum allowed input power for the test set.

If `Under Range (6)` is returned, the measured signal is below the expected input level.

See [“Integrity Indicator”](#) .

Loopback Bit Error Ratio Troubleshooting

Possible Setup Issues

During remote operation of the loopback bit error ratio measurement, you should configure the trigger arm to single. See [“SETup:WBERror”](#) and [“Triggering of Measurements”](#).

The mobile station (UE) must be configured in loopback mode 1, described in 3GPP TS 34.109. This requires the mobile station to decode the dedicated traffic channel (DTCH) data from the downlink and resend it in the uplink DTCH. When using FDD Test operating mode, this requires the operator to manually configure the mobile station during testing; no overhead messaging or signaling is provided to set up the mobile station in this operating mode.

This measurement always uses protocol triggering. A measurement cannot be made unless the mobile station (UE) is synchronized to the test set's downlink signal and is transmitting a corresponding uplink signal.

Measurement results are affected by any amplitude offsets that are entered, since the level into the UE is altered.

Interpreting Integrity Indicator Values

If `Measurement Timeout (2)` is returned, the test set initiated the measurement and attempted to post the measurement results before the measurement had completed. This is typically occurs when either of the following conditions exist:

- The measurement timeout value you entered for the measurement is too small for the number of bits being used. In this case, either reduce the number of bits to test or increase the timeout value.
- The measurement did not start due because it could not align the received data with the transmitted data. This happens if any of the following conditions occur:
 - The test set is unable to synchronize to the uplink signal.
 - The UE is not configured for the proper loopback mode.
 - The UE is not configured for the proper uplink transport format.

If `Synch Not Found (11)` is returned, the test set lost synchronization with the uplink for some period of time during the measurement.

If `Over Range (5)` is returned, the signal exceeds the maximum allowable level for the test set or is above the level expected by the test set.

If `Under Range (6)` is returned, the signal is below the minimum allowable level for the test set or is below the level expected by the test set.

Related Topics

[“Integrity Indicator”](#)

[“Loopback Bit Error Ratio Measurement Description”](#)

Thermal Power Troubleshooting

Possible Setup Issues

During remote operation of the thermal power measurement you should configure the trigger arm to single. See [“SETup:WTPower”](#) .

If the trigger arm is not set to single, the measurement may not return a result. When trigger arm is continuous, the measurement rearms itself and starts another measurement cycle; possibly interrupting the FETCh operation during remote use. See [“Measurement States”](#) .

The trigger source is always immediate for the thermal power measurement. No synchronization or external signals are required.

Measurement results are affected by any RF In/Out amplitude offsets that are entered. See [“Amplitude Offset”](#) .

The thermal power measurement value may be slightly higher than the channel power measurement's value (typically about 0.25 dB). This is because the channel power measurement is band-limited, rejecting the additional power that may be in the uplink signal's sidebands.

This is a broadband, unfiltered power measurement. Therefore, virtually any signal present at the RF IN/OUT connector will affect this measurement. If the measured level exceeds the channel power measurement by more than 0.25 dBm, verify that the only signal present is the mobile station's (UE) uplink signal.

Interpreting Integrity Indicator Values

This measurement uses autoranging to automatically set the expected level into the test set.

If `Over Range (5)` is returned, the signal exceeds the maximum allowable level for the test set.

If `Under Range (6)` is returned, the measured signal is below -21 dBm. The thermal power measurement is specified to operate accurately down to -10 dBm, and will operate with degraded accuracy down to -20 dBm. Use the channel power measurement for measuring lower level signals.

See [“Integrity Indicator”](#) .

Waveform Quality Troubleshooting

Possible Setup Issues

During remote operation of the waveform quality measurement you should configure the trigger arm to single. See [“Waveform Quality Troubleshooting”](#).

If the trigger arm is not set to single, the measurement may not return a result. When trigger arm is continuous, the measurement rearms itself and starts another measurement cycle, possibly interrupting the FETCh operation during remote use. See [“Measurement States”](#).

The mobile station (UE) must be synchronized to the test set for this measurement to operate correctly.

RF In/Out Amplitude offsets entered do not affect these measurement results unless the received signal level becomes too low to accurately detect relative I/Q modulation vector transitions.

Interpreting Integrity Indicator Values

If `Over Range (5)` is returned, the measured signal exceeds the expected input level or exceeds the maximum allowed input power for the test set.

If `Under Range (6)` is returned, the measured signal is below the expected input level.

If `Cannot Correlate (17)` is returned, the test set cannot demodulate the signal from the mobile station (UE). Make sure the uplink scrambling code from the mobile station matches the UL Scrambling setting on the test set (see [“CALL:UPLink”](#)).

See [“Integrity Indicator”](#).

Error Messages

Error Message Descriptions

[“Fixed Timer Messages” on page 459](#)

[“Manual User Error Messages” on page 462](#)

[“-400 through -499 Error Message Descriptions” on page 464](#)

[“-300 through -399 Error Message Descriptions” on page 465](#)

[“-200 through -299 Error Message Descriptions” on page 467](#)

[“-100 through -199 Error Message Descriptions” on page 470](#)

[“+100 through +199 Error Message Descriptions” on page 474](#)

[“+200 through +299 Error Message Descriptions” on page 477](#)

[“+300 through +399 Link Control Device-Specific Error” on page 478](#)

[“+400 through +499 Error Message Descriptions” on page 479](#)

[“+500 through +599 Test Application Hardware Device-Specific Error” on page 482](#)

[“+600 through +699 Error Message Descriptions” on page 483](#)

[“+700 through +799 Error Message Descriptions” on page 484](#)

[“+800 through +899 Error Message Descriptions” on page 485](#)

Description

Reading Error Messages

Each error message that is generated is recorded in either the error/event queue or the message log or both. Error messages are shown in a message window at the center of the test set’s display.

When an error message is displayed an audio beep occurs, the beeper state of the test set can be set to on or off.

The error/event queue is read remotely using the `SYSTEM:ERRor?` query. The error/event queue is able to hold 100 messages. To read the entire error/event queue use the following program.

```
10 DIM Err_msg$(255)
20 REPEAT
30 OUTPUT 714;"SYSTEM:ERROR?"
40 ENTER 714; Err_num,Err_msg$
50 PRINT Err_num,Err_msg$
60 UNTIL Err_num = 0
```

The message log may be viewed on the test set’s display by pressing the SYSTEM CONFIG screen’s Message Log key. The message log can display up to 24 entries over two pages.

Error messages can be cleared from the test set's display using the `DISPlay:WINDow:ERRor:CLear` command. Pressing any functional front panel key, i.e. the LOCAL key, will clear an error message for the test set's display.

Classes of Errors

Error messages are divided into classes, each class of error is handled differently by the test set. The message log is cleared when the test set is power cycled.

Measurement Integrity Indicators These messages occur as a result of a measurement, they indicate the validity of the measurement. Measurement integrity indicators are read with the `FETCh` command.

Non-Persistent Errors These messages are generated when a condition occurs that is incorrect, but has no serious or long lasting effect on the test set's operation. Examples could include an out of range value to a parameter, or an invalid GPIB mnemonic. The message window is cleared when any front panel key is pressed.

Persistent Errors These errors are generated when a non-transitory error condition exists. Persistent errors occur when a hardware failure is found, or when damage or injury to a person or the test set may occur.

The test set displays these errors in the error message window and as a prompt at the bottom of the display screen where it remains until the error condition no longer exists.

Fatal Errors When these errors occur no further operation of the test set is possible without cycling the power switch. Fatal errors are not saved in the error message log. The test set display will provide the user with information about what to do next and some details about what the test set was doing when the fatal error occurred.

Maskable Messages These messages are intended to inform the user of a condition within the test set. They are generally meant to provide information to the user. The user will need to decide if this condition is undesirable and if they want the message to appear.

Maskable Message Display State The Maskable Messages Display State found in the Instrument Setup menu gives users a way to block these messages and the associated beep from ever happening. When the state is Off these messages and their associated beep will be blocked. The Maskable Message Display State can be set manually or with the following GPIB command:

```
OUTPUT 714;"DISPLAY:MESSAGE:MASKABLE:STATE OFF" !Prevents certain messages from appearing on the display.
```

Instrument Maskable Messages

- Instrument warning: Audio Generator instrument has been closed.
- Instrument warning: Audio Analyzer instrument has been closed.
- Instrument warning: Analog Audio instrument has been closed.

Related Topics

["SYSTem:ERRor?" on page 401](#)

Error Message Log

Description

When an error message is displayed, it is also logged in the error message log. This log is only accessible manually; it is not available through GPIB. The error message log can be displayed by pressing the F7 menu key from the SYSTEM CONFIG screen. Next Page and Previous Page controls are provided.

All errors and events that are generated are displayed in the error message log. When the log is full a new message is sent to the log and the oldest message is removed from the log. The log is cleared when the test set powers up or when you press F10 (Clear Error Message Log).

Related Topics

[“Error Messages”](#)

Fixed Timer Messages

Description

This is the list of fixed timers with a brief explanation and their values. A timer expiry message appears in its own window, on the test set display. The user has no access to these values and can not change them. None of the fixed timers are active when operating mode is Test Mode.

Timer Name	Description	Value
T100 RADIO-LINK-TIMEOUT	Detects the presence of the radio link by detecting SACCH frames every 480 ms.	4 SACCH multiframes. That is 1.92 seconds if the SACCH is completely absent.
T200 Data link timer	Used for re-transmission on the data link. The value varies depending on the message type.	155 ms for FACCH
T301 Alerting (ringing) timer	Timer used to limit the amount of time a user has to answer a call.	20 seconds
T303 Mobility Management connection timer	Time the network waits after sending a CM SERVICE REQUEST until receiving a response. This occurs before initiating call clearing procedures towards the MS.	10 seconds
T305 Release timer	Time the network waits after transmitting a DISCONNECT message until receiving a RELEASE message.	10 seconds
T306 In-band tones release timer	Time the network waits after transmitting a DISCONNECT message while in-band tones/announcements are provided, until receiving a RELEASE message.	10 seconds
T308 Release timer	Time the network waits after sending a RELEASE message until receiving a RELEASE COMPLETE message. This occurs before re-transmitting the RELEASE or releasing the Mobility Management connection.	10 seconds
T310 Call proceeding timer	Time the network waits after receiving a CALL CONFIRMED message until receiving a ALERTING, CONNECT, or DISCONNECT message before initiating clearing procedures towards the MS.	10 seconds

Fixed Timer Messages

Timer Name	Description	Value
T313 Connect acknowledge timer	Time the network waits after transmitting a CONNECT message until receiving the CONNECT ACKNOWLEDGE message before performing clearing procedures with the MS.	10 seconds
T323 Modify complete timer	Time the network waits after sending a MODIFY message during call mode changes, until receiving a MODIFY COMPLETE or MODIFY REJECT message before initiating call clearing procedures.	10 seconds
T3101 Immediate assignment timer	Time the network waits after sending the IMMEDIATE ASSIGNMENT or IMMEDIATE ASSIGNMENT EXTENDED message until the main signalling link is established before releasing the newly allocated channels.	1 second
T3103 Handover timer	Time the network waits after transmitting a HANDOVER COMMAND message until receiving HANDOVER COMPLETE or HANDOVER FAILURE or the MS re-establishes the call before the old channels are released. If the timer expires and the network has not received a correctly decoded L2 (format A or B) or TCH frame, then the newly allocated channels are released.	2 seconds
T3105 Physical information repetition timer	Time the network waits after sending the PHYSICAL INFORMATION message until receiving a correctly decoded L2 (format A or B) or TCH frame. This occur before re-transmitting the PHYSICAL INFORMATION message or releasing the newly allocated channels.	50 ms
T3107 Channel assignment timer	Time the network waits after transmitting an ASSIGNMENT COMMAND message until receiving the ASSESSMENT FAILURE message or the MS re-establishes the call before releasing the old and the new channels.	3 seconds
T3109 Signalling disconnection timer	Time the network waits after sending the CHANNEL RELEASE message before disconnecting the signalling link.	5 seconds
T3111 Channel deactivation after disconnection timer	Time the network waits after disconnecting the signalling link before deactivating the channel.	500 ms

Timer Name	Description	Value
T3113 Paging timer	Time the network waits after transmitting the PAGING REQUEST message until receiving the PAGING RESPONSE message. This occurs before re-transmitting the PAGING REQUEST (if the maximum number of re-transmissions have not been exceeded).	5 seconds
T3212 Location update timer	The location update timer is set to zero, periodic location update by the MS are disabled. If the MS camps to the BCH and decodes a new MCC or MNC from the one it last camped on, it should perform a location update.	zero = infinite time
T3250 TMSI reallocation timer	Time the network waits after sending the TMSI REALLOCATION COMMAND until receiving TMSI REALLOCATION COMPLETE. This occurs before aborting the procedure and releasing the Radio Resource connection.	5 seconds
T3260 Authentication response timer	Time the network waits after an AUTHENTICATION REQUEST until receiving AUTHENTICATION RESPONSE. This occurs before aborting the procedure and releasing the Radio Resource connection.	5 seconds

Manual User Error Messages

Description

These messages are intended to be displayed on the manual user interface only, and are not entered into the Error/Event Queue.

Error Message	Description
The function you requested is not yet available.	The test set does not have this capability.
IQ Calibration completed successfully for modulator <N>	<N> is the IQ modulator number that you are attempting to calibrate, <N> is 1 or 2.
IQ Calibration failed for modulator <N>	<N> is the IQ modulator number that you are attempting to calibrate, <N> is 1 or 2.
The function you requested is not available in this TA.	This function is used in another Test Application.
IQ Calibration for modulator 1 in progress (10 minutes). Call processing disabled.	This error is cleared by either the; IQ Calibration completed successfully for modulator <N>, or IQ Calibration failed for modulator <N>.
IQ Calibration for modulator 2 in progress (6 minutes). Call processing disabled.	This error is cleared by either the; IQ Calibration completed successfully for modulator <N>, or IQ Calibration failed for modulator <N>.
Instrument warning: Audio generator instrument has been closed.	The audio generator instrument was closed automatically by the test set.
Measurement warning: Audio Analyzer instrument has been closed.	The audio analyzer instrument was closed automatically by the test set.
Measurement warning: Analog audio measurement has been closed.	Analog audio measurements have been closed by the test set.
Protocol warning: Setting change has terminated the link with the DUT	Some setting change has caused the call to disconnect.
Warning: Call processing disabled	The call processing functions are not active because the test set is performing calibration operations.
IQ first modulator calibration X%	IQ modulator calibration in progress, X represents the percent complete.
IQ second modulator calibration X%	IQ modulator calibration in progress, X represents the percent complete.

WCDMA and FDD Manual User Messages

Table 9.

Error Message	Description
Channel power calibration completed successfully.	The calibration procedure for the channel power and adjacent channel leakage ratio (ACLR) measurements completed without problems.
Channel power calibration failed due to temperature drift. Wait for temperature to stabilize.	The temperature in the test set was changing during calibration, causing the calibration to fail.
Channel power calibration failed due to oven out of range.	Indicates an internal problem during measurement calibration.
Channel power calibration failed due to loopback switch problem.	Indicates an internal problem during measurement calibration.
Channel power calibration failed due to under range condition.	Indicates an internal problem during measurement calibration.
Channel power calibration failed due to over range condition.	Indicates an internal problem during measurement calibration.
Channel power calibration failed due to correlation problem.	Indicates an internal problem during measurement calibration.
Channel power calibration failed.	The measurement calibration procedure failed for an unspecified reason.
Channel power calibration in progress. Do not apply RF power during calibration	Tells you to not apply power during measurement calibration.
Channel power calibration <x>%.	Progress indicator for the measurement calibration routine.
FDD measurement warning; Thermal Power measurement has been closed.	Indicates that a measurement has been inactivated because of a resource conflict. This message is typically generated when thermal power measurements are initiated.
FDD measurement warning; Adjacent Channel Leakage Ratio measurement has been closed.	Indicates that a measurement has been inactivated because of a resource conflict. This message is typically generated when adjacent channel leakage ratio measurements are initiated.
FDD measurement warning; Waveform Quality measurement has been closed.	Indicates that a measurement has been inactivated because of a resource conflict. This message is typically generated when waveform quality measurements are initiated.
FDD measurement warning; Average Power measurement has been closed.	Indicates that a measurement has been inactivated because of a resource conflict. This message is typically generated when average power measurements are initiated.
FDD measurement warning; Loopback Bit Error Ratio measurement has been closed.	Indicates that a measurement has been inactivated because of a resource conflict. This message is typically generated when loopback bit error ratio measurements are initiated.

-400 through -499 Error Message Descriptions

Description

A Query error is generated either when data in the instrument's GPIB output queue has been lost, or when an attempt is being made to read data from the output queue when no output is present or pending.

Error Message	Description
-400 Query error	This event bit (Bit 2) indicates that an attempt to read data from the Output Queues when no output is present or pending, to data in the Output Queue has been lost see IEEE488.2, 11.5.1.1.7.
-410 Query INTERRUPTED	Indicates the test set has been interrupted by a new program message before it finishes sending a RESPONSE MESSAGE see IEEE 488.2, 6.3.2.3.
-420 Query UNTERMINATED	Indicates an incomplete Query in the program see IEEE 488.2, 6.3.2.2.
-430 Query DEADLOCKED	Indicates that the Input Buffer and Output Queue are full see IEEE 488.2, 6.3.1.7.
-440 Query UNTERMINATED after indefinite response	Indicates that a query was received in the same program message after a query requesting an indefinite response was executed see IEEE 488.2, 6.5.7.5.

-300 through -399 Error Message Descriptions

November 14, 2001

Description

A device-specific error indicates that the instrument has detected an error that occurred because some operations did not properly complete, possibly due to an abnormal hardware or firmware condition. For example, an attempt by the user to set an out of range value will generate a device specific error. When one of these errors is generated, the device specific error bit in the event status register is set.

Error Message	Description
-300 Device specific error	This event bit (Bit 3) indicates that a device operation did not properly complete due to some condition, such as overrange see IEEE 488.2, 11.5.1.1.6.
-311 Memory error	Indicates some physical fault in the devices memory, such as a parity error.
-312 PUD memory lost	Indicates protected user data saved by the *PUD command has been lost, see IEEE 488.2, 10.27.
-313 Calibration memory lost	Indicates that nonvolatile calibration data used by the *CAL? command has been lost, see IEEE 488.2, 10.2.
-314 Save/recall memory lost	Indicates that the nonvolatile data saved by the *SAV command has been lost, see IEEE 488.2, 10.33.
-315 Configuration memory lost	Indicates that nonvolatile configuration data saved by the device has been lost.
-320 Storage fault	Indicates that the firmware detected a fault when using data storage. This is not an indication of physical damage or failure of any mass storage element.
-321 Out of memory	An internal operation needed more memory than was available
-330 Self test failed	Indicates a problem with the device that is not covered by a specific error message. The device may require service.
-340 Calibration failed	Indicates a problem during calibration of the device that is not covered by a specific error.
-350 Queue overflow	Indicates that there is no room in the queue and an error occurred but was not recorded. This code is entered into the queue in lieu of the code that caused the error.

-300 through -399 Error Message Descriptions

Error Message	Description
-360 Communication error	This is the generic communication error for devices that cannot detect the more specific errors described for error -361 through -363.
-361 Parity error in program message	Parity bit not correct when data received for example, on a serial port.
-362 Framing error in program message	A stop bit was not detected when data was received for example, on a serial port (for example, a baud rate mismatch).
-363 Input buffer overrun	Software or hardware input buffer on serial port overflows with data caused by improper or nonexistent pacing.

-200 through -299 Error Message Descriptions

Description

These errors are generated when something occurs that is incorrect in the current state of the instrument. These errors may be generated by a user action from either the remote or the manual user interface.

Error Message	Description
-200 Execution error	This event bit (Bit 4) indicates a PROGRAM DATA element following a header was outside the legal input range or otherwise inconsistent with the device's capabilities, see IEEE 488.2, 11.5.1.1.5.
-203 Command protected	Indicates that a legal password-protected program command or query could not be executed because the command was disabled.
-220 Parameter error	Indicates that a program data element related error occurred.
-221 Setting conflict	Indicates that a legal program data element was parsed but could not be executed due to the current device state.
-222 Data out of range	Indicates that a legal program data element was parsed but could not be executed because the interpreted value was outside the legal range defined by the devices
-223 Too much data	Indicates that a legal program data element of block, expression, or string type was received that contained more data than the device could handle due to memory or related device-specific requirements.
-224 Illegal parameter value	Indicates that the value selected was not part of the list of values given.
-225 Out of memory	The device has insufficient memory to perform the requested operation.
-226 Lists not the same length	Attempted to use LIST structure having individual LIST's of unequal lengths.
-230 Data corrupt or stale	Indicates invalid data, a new reading started but not completed since the last access.
-231 Data questionable	Indicates that measurement accuracy is suspect.

-200 through -299 Error Message Descriptions

Error Message	Description
-233 Invalid version	Indicates that a legal program data element was parsed but could not be executed because the version of the data is incorrect to the device. For example, a not supported file version, a not supported instrument version.
-240 Hardware error	Indicates that a legal program command or query could not be executed because of a hardware problem in the device.
-241 Hardware missing	Indicates that a legal program command or query could not be executed because of missing device hardware. For example, an option was not installed.
-250 Mass storage error	Indicates that a mass storage error occurred. The device cannot detect the more specific errors described for errors -251 through -259.
-251 Missing mass storage	Indicates that a legal program command or query could not be executed because of missing mass storage.
-252 Missing media	Indicates that a legal program command or query could not be executed because of missing media. For example, no disk.
-253 Corrupt media	Indicates that a legal program command or query could not be executed because of corrupt media. For example, bad disk or wrong format.
-254 Media full	Indicates that a legal program command or query could not be executed because the media is full. For example, there is no room left on the disk.
-255 Directory full	Indicates that a legal program command or query could not be executed because the media directory was full.
-256 File name not found	Indicates that a legal program command or query could not be executed because the file name was not found on the media.
-257 File name error	Indicates that a legal program command or query could not be executed because the file name on the device media was in error. For example, an attempt was made to read or copy a nonexistent file.
-258 Media protected	Indicates that a legal program command or query could not be executed because the media was protected. For example, the write-protect switch on a memory card was set.
-270 Macro error	Indicates that a macro related execution error occurred.

Error Message	Description
-271 Macro syntax error	Indicates that a syntactically legal macro program data sequence, according to IEEE 488.2, 10.7.2, could not be executed due to a syntax error within the macro definition.
-272 Macro execution error	Indicates that a syntactically legal macro program data sequence could not be executed due to some error in the macro definition, see IEEE 488.2, 10.7.6.3.
-273 Illegal macro label	Indicates that the macro label was not accepted, it did not agree with the definition in IEEE 488.2, 10.7.3
-274 Macro parameter error	Indicates that the macro definition improperly used a macro parameter placeholder, see IEEE 488.2, 10.7.3.
-275 Macro definition too long	Indicates that a syntactically legal macro program data sequence could not be executed because the string of block contents were too long for the device to handle, IEEE 488.2, 10.7.6.1.
-276 Macro recursion error	Indicates that a syntactically legal macro program data sequence could not be executed because it would be recursive, see IEEE 488.2, 10.7.6.6.
-277 Macro redefinition not allowed	Indicates that redefining an existing macro label, see IEEE 488.2, 10.7.6.4.
-278 Macro header not found	Indicates that a legal macro label in the *GMS?, see IEEE 488.2, 10.13, could not be executed because the header was not previously defined.

-100 through -199 Error Message Descriptions

Description

A command error indicates that the test set's GPIB parser has detected an IEEE 488.2 syntax error. When one of these errors is generated, the command error bit in the event status register is set.

Error Message	Description
-100 Command error	This event bit (Bit 5) indicates a syntax error, or a semantic error, or a GET command was entered, see IEEE 488.2, 11.5.1.1.4.
-101 Invalid character	Indicates a syntactic elements contains a character which is invalid for that type.
-102 Syntax error	Indicates that an unrecognized command or data type was encountered. For example, a string was received when the device does not accept strings.
-103 Invalid separator	The parser was expecting a separator and encountered an illegal character. For example, the semicolon was omitted after a program message unit.
-104 Data type error	The parser recognized a data element different than one allowed. For example, numeric or string data was expected but block data was encountered.
-105 Get not allowed	Indicates a Group Execute Trigger was received within a program message. Correct the program so that the GET does not occur within the program code.
-108 Parameter not allowed	Indicates that more parameters were received than expected for the header. For example, *ESE common command only accepts one parameter, so *ESE 0,1 is not allowed.
-109 Missing parameter	Indicates that less parameters were received than required for the header. For example, *ESE requires one parameter, *ESE is not allowed.
-110 Command header error	Indicates an error was detected in the header. This error is used when the device cannot detect the more specific errors -111 through -119.
-111 Header separator error	Indicates that a character that is not a legal header separator was encountered while parsing the header.
-112 Program mnemonic too long	Indicates that the header contains more than twelve characters, see IEEE 488.2, 7.6.1.4.1.

Error Message	Description
-113 Undefined header	Indicates the header is syntactically correct, but it is undefined for this specific device. For example, *XYZ is not defined for any device.
-114 Header suffix out of range	Indicates the value of a header suffix attached to a program mnemonic makes the header invalid.
-120 Numeric data error	This error, as well as errors -121 through -129, are generated when parsing a data element which appears to be numeric, including non-decimal numeric types. This particular error is used if the device cannot detect a more specific error.
-121 Invalid character in number	Indicates an invalid character for the data type being parsed was encountered. For example, an alpha in a decimal numeric or a “9” in octal data.
-123 Exponent too large	Indicates the magnitude of an exponent was greater than 32000, see IEEE 488.2, 7.7.2.4.1.
-124 Too many digits	Indicates the mantissa of a decimal numeric data element contained more than 255 digits excluding leading zeros, see IEEE 488.2, 7.7.2.4.1.
-128 Numeric data not allowed	Indicates that a legal numeric data element was received, but the device does not accept one in this position for the header.
-130 Suffix error	This error, as well as errors -131 through -139, are generated when parsing a suffix. This particular error message is used if the device cannot detect a more specific error.
-131 Invalid suffix	Indicates the suffix does not follow the syntax described in IEEE 488.2, 7.7.3.2, or the suffix is inappropriate for this device.
-134 Suffix too long	Indicates the suffix contain more than 12 characters, see IEEE 488.2, 7.7.3.4.
-138 Suffix not allowed	Indicates that a suffix was encountered after a numeric element that does not allow suffixes.
-140 Character data error	This error, as well as errors -141 through -149, are generated when parsing a character data element. This particular error message is used if the device cannot detect a more specific error.
-141 Invalid character data	Indicates that the character data element contains an invalid character or the particular element received is not valid for the header.
-144 Character data too long	Indicates the character data element contains more than twelve characters, see IEEE 488.2, 7.7.1.4.

-100 through -199 Error Message Descriptions

Error Message	Description
-148 Character not allowed	Indicates a legal character data element was encountered where prohibited by the device.
-150 String data error	This error, as well as errors -151 through -159, are generated when parsing a string data element. This particular error message is used if the device cannot detect a more specific error.
-151 Invalid string data	Indicates that a string data element was expected, but was invalid, see IEEE 488.2, 7.7.5.2. For example, an END message was received before the terminal quote character.
-158 String data not allowed	Indicates that a string data element was encountered but was not allowed by the device at this point in parsing.
-160 Block data error	This error, as well as errors -161 through -169, are generated when parsing a block data element. This particular error message is used if the device cannot detect a more specific error.
-161 Invalid block data	Indicates a block data element was expected, but was invalid, see IEEE 488.2, 7.7.6.2. For example, an END message was received before the end length was satisfied.
-168 Block data not allowed	Indicates a legal block data element was encountered, but not allowed by the device at this point in parsing.
-170 Expression error	This error, as well as errors -171 through -179, are generated when parsing an expression data element. This particular error message is used if the device cannot detect a more specific error.
-171 Invalid expression	Indicates the expression data element was invalid, see IEEE 488.2, 7.7.7.2. For example, unmatched parentheses or an illegal character.
-178 Expression data not allowed	Indicates a legal expression data was encountered, but was not allowed by the device at this point in parsing.
-180 Macro error	This error, as well as error -181 through -189, are generated when defining a macro or execution a macro. This particular error message is used if the device cannot detect a more specific error.
-181 Invalid output macro definition	Indicates that a macro parameter place holder was encountered outside of a macro definition.
-183 Invalid inside macro definition	Indicates that the program message unit sequence, sent with a *DDT or a *DMC command, is syntactically invalid, see IEEE 488.2, 10.7.6.3.

Error Message	Description
-184 Macro parameter error	Indicates that a command inside the macro definition had the wrong number or type of parameters.

+100 through +199 Error Message Descriptions

Description

A device-specific error indicates that the instrument has detected an error that occurred because some operations did not properly complete, possibly due to an abnormal hardware or firmware condition. For example, an attempt by the user to set an out of range value will generate a device specific error.

These are general errors generated by the core instrument. When one of these errors is generated, the '+100 errors' bit in the questionable error status register is set.

Error Message	Description
+101 Assert; Cycle power. Assert message<message1>	<p><message1> will appear as:</p> <p>If the DSP generated the assert:</p> <p style="padding-left: 40px;">;P:DSP T:<task ID> E:<error code> C:<error classif.> F1:<flag 1> F2:<flag 2></p> <p>If the Protocol processor generated the assert:</p> <p style="padding-left: 40px;">;P:Protocol T:<task ID> L:<line number> F:<file name></p> <p>If the Host processor generated the assert:</p> <p style="padding-left: 40px;">;P:Host T:<task ID> L:<line number> F:<file name></p>
+102 Exception; Cycle power. Exception message<message2>	<p><message2> will appear as: T:<task ID> or V:<vector number> or PC:<program counter> or DA:<data adrs reg value>.</p> <p>Vector number, program counter and data address register values are hexadecimal format.</p>
+103 Failure; No measurements or settings can be made	Indicates none of the VI's are operational because a serious problem exists.
+104 Failure; No settling operations will take place	Indicates none of the VI's are operational because a serious problem exists.
+105 Failure; No measurements or setting can be made for the function selected	Indicates none of the VI's are operational because a serious problem exists.
+110 Input pacing; Internal communication queue overflow likely	Indicates that GPIB commands are too fast for the device input queue and should be slowed.
+111 Input pacing; Internal communication queue overflow imminent. Pacing increased	Indicates that GPIB commands were too fast and the device input queue has not kept pace.
+112 Internal error; Protocol error <message3>	<message3> is an eight digit hexadecimal number that is the error code reported by protocol.

Error Message	Description
+113 Internal error; <VI NAME> forced inactive	Indicates that a VI is inactivated when not executed. <VI NAME> includes : "IntVmVI", "GprsBsEmulVI", "GsmComBsEmulVI", "GSMFixedVI", "MiscVI", "GSMSacchMriVI", "IQSelfCalVI1", "IQSelfCalVI2", "TA RevisionVI", "TdmaTaBsEmulVI".
+114 Internal error; <VI NAME> not responding	Indicates that a VI has not been instantiated or the state is not available. <VI NAME> includes : "IntVmVI", "GprsBsEmulVI", "GsmComBsEmulVI", "GSMFixedVI", "MiscVI", "GSMSacchMriVI", "IQSelfCalVI1", "IQSelfCalVI2", "TA RevisionVI", "TdmaTaBsEmulVI", "RfHwAccessVI".
+115 Internal error; <VI NAME> inactive	Indicates that a VI has been made inactive. <VI NAME> includes : "IntVmVI", "GSMFixedVI", "MiscVI", "GSMSacchMriVI", "IQSelfCalVI1", "IQSelfCalVI2", "TA RevisionVI".
+120 Warning; Receiver over range due to requested settings	Indicates the total received power (a combination of received power and amplitude offset) is above the range of the test set.
+121 Warning; Receiver under range due to requested settings	Indicates the total received power (a combination of received power and amplitude offset) is below the range of the test set.
+122 Warning; Reference out of lock	Indicates the test set's internal reference is out of lock.
+123 Warning; Duplicate RF IN/OUT Amplitude Offset Frequency entry. First frequency entry in RF IN/OUT Amplitude Offset table will be used.	Indicates that an amplitude offset value for that frequency has already been entered. The test set will use the amplitude offset value entered first.
+124 Warning; Source over range due to requested settings	The setting selected for total transmit power (a combination of cell power, awgn power, amplitude offset) is above the test set's range.
+125 Warning; Source under range due to requested settings	The setting selected for total transmit power (a combination of cell power, awgn power, amplitude offset) is below the test set's range.
+130 Configuration error; Unable to switch to indicated Test Application	The test application selected is not available for this test set.
+131 Configuration error; Current Test Application is not licensed (License = N). Select another Test Application	The test application selected is not licensed. Select another revision or test application that is licensed (License = L).

+100 through +199 Error Message Descriptions

Error Message	Description
+132 Configuration error; Selected Test Application Format is not available.	Indicates that the fast switching operation will not activate a particular radio format. Check the revision number of the test application associated with the radio format, does the revision correspond with what the fast switching test application needs?
+133 Configuration error; Selected Test Application Format is not licensed, (License = N).	The radio format selected is not licensed. Select another revision or obtain a licensed revision of the test application test application that is licensed (License = L).
+134 Configuration error; Unable to switch to selected Test Application Format	The Test Application Format name used is correct but for some reason the test set can not switch to that format.
+142 Configuration error; Functionality not available	An attempt has been made to access lab application functions from a test application.
+150 Calibration operation; Recalibrating due to present temperature	Indicates that the test set is recalibrating due to hardware inaccuracies based on temperature changes. Any measurements that are running will be temporarily aborted and then restarted after the recalibration is complete.

+200 through +299 Error Message Descriptions

Description

A device-specific error indicates that the instrument has detected an error that occurred because some operations did not properly complete, possibly due to an abnormal hardware or firmware condition. For example, an attempt by the user to set an out of range value will generate a device specific error.

When one of these errors is generated, the +200 errors bit in the questionable error status register is set.

Table 10. FDD Call Processing Errors

Error Message	Description
+217 Performance not specified for UL/DL frequency offset < 30 MHz	Performance is not specified when the difference in the uplink and downlink frequencies is less than 30 MHz.
+218 FDD Settings Deferred: Cell power and AWGN power > 10 dB apart.	AWGN and Cell Power settings must be within 10 dB of each other.
+221 FDD Test Mode Settings Deferred: Sum of code channel power levels > 0 dB	The sum of the code channels cannot exceed 0 dB. Reduce one or more channel levels.
+224 FDD Test Mode Settings Deferred: One or more code channel power levels > 30 dB below total RF power	The power of at least one code channel is more than 30 dB below the total RF power, exceeding the test set's limits.

+300 through +399 Link Control Device-Specific Error

These errors are generated when a problem occurs in maintaining the link between the test set and a DUT. These errors generally occur when a message is received from the DUT that is unexpected.

When one of these errors is generated, the '+300 errors' bit in the questionable error status register is set. Refer to "[Standard Event Status Register](#)" on page 376 for information on this register.

No link control errors are currently defined for this test application.

+400 through +499 Error Message Descriptions

Description

These errors are generated when a problem occurs in one of the test set's hardware modules that is part of the test set's core instrument.

When one of these errors is generated, the '+400 errors' bit in the questionable error status register is set.

Error Message	Description
+400 Hardware failure; Hardware is not available	
+401 Hardware failure; Protocol processor hardware is not responding	
+402 Hardware failure; Demod receiver hardware is not responding	
+403 Hardware failure; Measurement receiver hardware is not responding	
+404 Hardware failure; RF source 1 hardware is not responding	
+405 Hardware failure; RF source 1 digital modulation hardware is not responding	
+406 Hardware failure; RF source 1 level hardware is not responding	
+407 Hardware failure; DSP demod control hardware is not responding	
+408 Hardware failure; 2nd demod receiver hardware is not responding	
+409 Hardware failure; Base station emulator trigger hardware is not responding	
+410 Hardware failure; Audio source hardware is not responding	
+411 Hardware failure; RF source 2 hardware is not responding	
+412 Hardware failure; Internal voltmeter hardware is not responding	
+413 Hardware failure; Fixed timebase input is not responding	

+400 through +499 Error Message Descriptions

Error Message	Description
+414 Hardware failure; Fixed external reference output is not responding	
+415 Hardware failure; Instrument reference is not responding	
+416 Hardware failure; Bit clock A is not responding	
+417 Hardware failure; RF source 2 frequency hardware is not responding	
+418 Hardware failure; RF source 2 digital modulation hardware is not responding	
+419 Hardware failure; RF source 2 level hardware is not responding	
+420 Hardware failure; RF source hopping hardware is not responding	
+421 Hardware failure; Digital demod hopping hardware is not responding	
+422 Hardware failure; Misc VI hardware is not responding	
+423 Hardware failure; Unable to access networking information	
+424 Hardware failure; Bit clock B is not responding	
+425 Hardware failure; Invalid EEPROM checksum <EEPROM board ID>	See the list of EEPROM board ID names below.
+426 Hardware failure; Unable to write to EEPROM <EEPROM board ID>	See the list of EEPROM board ID names below.
+427 Hardware failure; Unable to read from EEPROM <EEPROM board ID>	See the list of EEPROM board ID names below.
+428 Hardware failure; Board not identified <board ID>	See the list of board ID names below.
+429 Hardware failure; Could not create board identification <board ID>	See the list of board ID names below.
+430 Hardware failure; Control version not compatible with FW <board ID>	See the list of board ID names below.
+431 Hardware failure; RF IO DAC cannot be calibrated due to present temperature	
+432 Hardware failure; RF hardware is not responding	
+433 Hardware failure; RF source FM hardware is not responding	
+434 Hardware failure; Audio source FM hardware is not responding	

Error Message	Description
+460 Hardware failure; Hardware doesn't support requested operation	This error occurs when a setting is attempted that is not possible with the test set's hardware. The current firmware needs new hardware in order to work.
+461 Hardware failure; Link subsystem hardware is not responding. Call processing functionality not operational.	This error occurs any time the link subsystem is not operating correctly. The message is persistent to warn the user that any call processing operations will not work.
+462 Hardware error; Hardware not supported; <board ID><part_number>	This error appears when an operation was attempted that requires hardware that is not installed in the test set.
+463 Hardware error: RFIO version does not support loopback switching.	
+464 Hardware error: RFIO version does not support RF out only selection.	This error occurs when trying to select the RF OUT ONLY port when the test set has the RF I/O module that only has the RF IN/OUT port.

<board ID> names

3 GHZ ATTENUATOR 1 | ;3GHZ ATTENUATOR 2 | ;AUDIO BD | ;ROM BASEBAND GENERATOR 1 | ;ROM BASEBAND GENERATOR 2 | ;DEMOD DOWNCONVERTER | ;VECTOR OUTPUT BOARD 1 | ;VECTOR OUTPUT BOARD 2 | ;IVF MEASUREMENT | ;MEASUREMENT DOWCONVERTER | ;RF POWER DETECTORS | ;REFERENCE MODULE | ;SYNTH DOUBLER 1 | ;SYNTH DOUBLER 2 | ;TIMING REF | ;MOMENTUM INSTRUMENT | ;RF MOTHER BOARD | ;JUMPER BOARD | ;DIGITAL MOTHER BOARD | ;FLAT PANEL ADAPTER | ;REAR PANEL BOARD

<EEPROM board ID> names

Instrument Eeprom ID State | ;Atten 1 Eeprom ID State | ;Atten 2 Eeprom ID State | ;Audio Eeprom ID State | ;BaseBandGen 1 Eeprom ID State | ;BaseBandGen 2 Eeprom ID State | ;Demod DC Eeprom ID State | ;Digital Mother Board Eeprom ID State | ;IQ Output 1 Eeprom ID State | ;IQ Output 2 Eeprom ID State | ;IVF Meas Eeprom ID State | ; Jumper Board Eeprom ID State | ; Meas DC Eeprom ID State | ;RF Mother Board Eeprom ID State | ;RF Interface Eeprom ID State | ; Ref Mod Eeprom ID State | ;Sig Gen 1 Eeprom ID State | ; Sig Gen 2 Eeprom ID State | ;Time Ref Eeprom ID State | ;Display Interface Eeprom ID State | ;Rear Panel Eeprom ID State

+500 through +599 Test Application Hardware Device-Specific Error

Description

These errors are generated when a problem occurs with a hardware module that is required for a particular test application.

When one of these errors is generated, the '+500 errors' bit in the questionable error status register is set.

No hardware specific errors are currently defined for this test application.

+600 through +699 Error Message Descriptions

Description

These errors are generated when a problem occurs that is specific to one of the test set's instruments. These errors are part of the test set's core. Note that these measurements may not be present in every test application and therefore, these errors may not be present in every test application. There is no plan at present to support test application specific instruments.

An instrument in this context refers to the measurement-like functionality such as the audio generator and not to the test set as a whole.

When one of these errors is generated, the '+600 errors' bit in the questionable error status register is set.

Error Message	Description
+601 Instrument failure; Audio generator hardware is not responding	Indicates a problem occurs when attempting to control the test set's audio generator.

+700 through +799 Error Message Descriptions

Description

A device-specific error indicates that the instrument has detected an error that occurred because some operations did not properly complete, possibly due to an abnormal hardware or firmware condition. For example, an attempt by the user to set an out of range value will generate a device specific error.

When one of these errors is generated, the +700 errors bit in the questionable error status register is set.

Table 11. FDD System Measurement Errors

Error Message	Description
+701 FDD measurement failure; Thermal Power hardware is not responding	A hardware failure associated with this measurement is suspected. Rerun the measurement to verify this error.
+702 FDD measurement failure; Adjacent Channel Leakage Ratio hardware is not responding	A hardware failure associated with this measurement is suspected. Rerun the measurement to verify this error.
+703 FDD measurement failure; Waveform Quality hardware is not responding	A hardware failure associated with this measurement is suspected. Rerun the measurement to verify this error.
+704 FDD measurement failure; Average Power hardware is not responding	A hardware failure associated with this measurement is suspected. Rerun the measurement to verify this error.
+705 FDD measurement failure; Loopback Bit Error Ratio hardware is not responding	A hardware failure associated with this measurement is suspected. Rerun the measurement to verify this error.

+800 through +899 Error Message Descriptions

Description

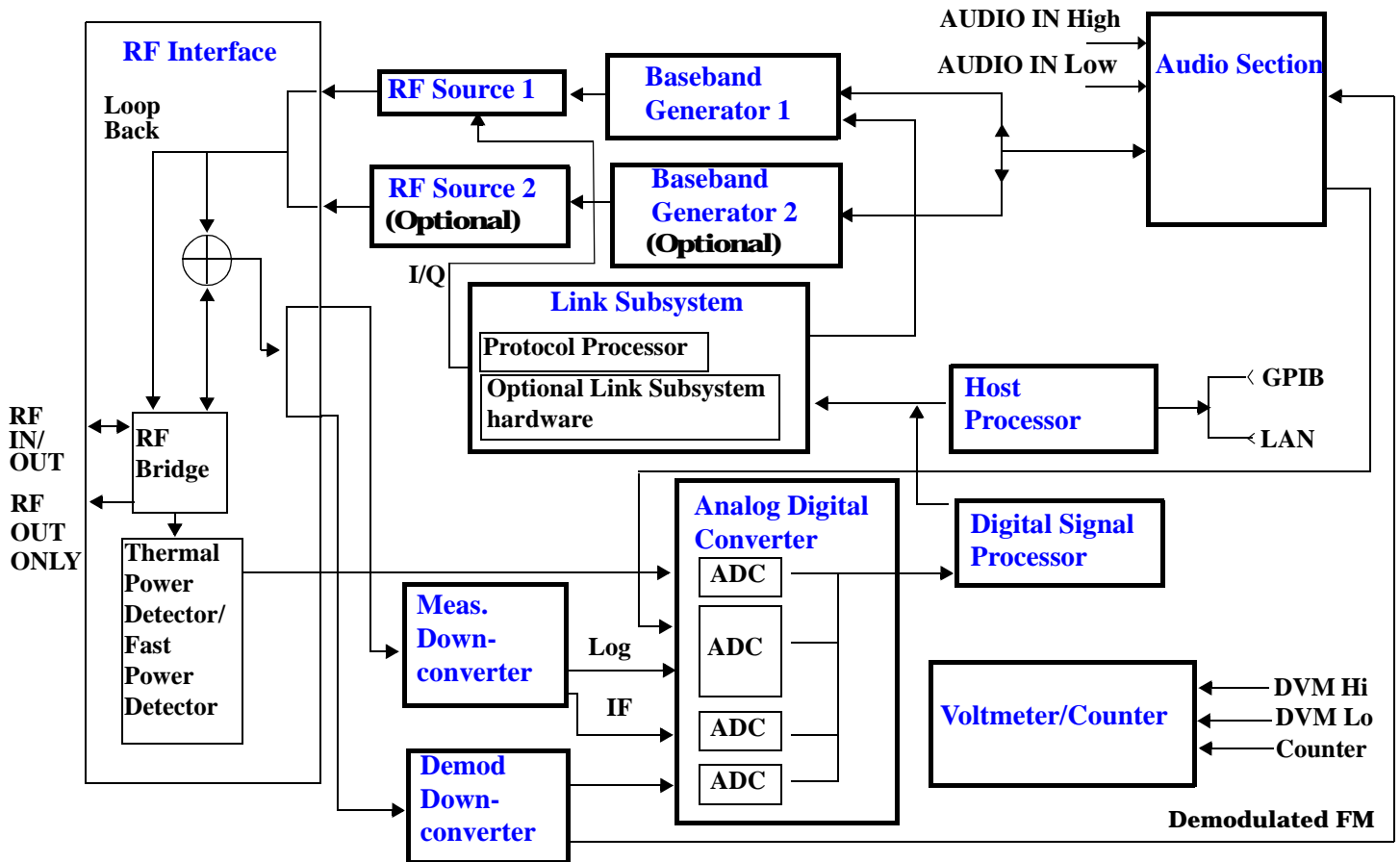
These errors are generated when a problem occurs that is specific to one of the test set's core measurements (such as analog audio).

When one of these errors is generated, the '+800 errors' bit in the questionable error status register is set.

Error Message	Description
+801 Measurement failure; Analog audio hardware is not responding	Indicates that a problem occurs when attempting to control the measurement's hardware.
+802 Measurement failure; Audio analyzer hardware is not responding	Indicates that a problem occurs when attempting to control the measurement's hardware.

Block Diagram

Description



RF Interface Module

Input and output signals are routed through the RF Interface module. The RF Interface module consists of:

- A directional bridge for sampling incoming power.
- Hybrid power splitters which create 4 bidirectional ports, (two receiver ports and two source ports). The directional bridge couples power to the Power Detector.
- RF amplifiers.
- Video gain circuits
- Fast and thermal power detectors

The RF Interface module provides two identical RF Source path connections to the In/Out port of the instrument. There is about 25 dB of isolation between the two source paths. There is about 35 dB of isolation between the source paths and either receiver path. The RFIO module has nominally 23 dB of insertion loss in the source path. A temperature sensing circuit facilitates compensation for path loss variation with temperature.

The source signals can be looped back through the input signal path to cross-calibrate the Measurement Downconverter and the Power Detector.

The sampled input power from the directional bridge can be amplified by as many as two 18 dB range amplifiers and then can be directed to the fast detector or the thermal detector. The input power to the fast detector is detected by a diode detector that is part of a feedback loop. The input to the thermal detector is measured in a bridge using a pair of RMS thermal detectors in a feedback loop.

Signal Downconversion

The test set's downconversion receiver section has two downconversion modules; a Measurement Downconversion Module for making measurements, and a Demodulation Downconversion Module for maintaining the radio link.

Demodulation Downconverter Module The Demodulation Downconverter module is used as part of the demodulation receiver that maintains the radio link.

Measurement Downconverter Module The Measurement Downconverter module provides high quality (wide dynamic range, spurious free) signals to the Analog To Digital Converter module's measurement sampler input.

The Measurement Downconverter module is designed for very high performance operation to ensure accurate and repeatable measurement results. The Measurement Downconverter module contains two downconversion stages, two local oscillators, and a logarithmic IF envelope detector. Both first and second LO synthesizers are tunable. The first LO is used when tuning to the RF input frequency, and the second LO is used when setting second IF frequency, which is fed to the measurement sampler on the Analog To Digital Converter module.

Link Subsystem

The Link Subsystem maintains the radio link for all CDMA formats. The Link Subsystem has two parts:

- Protocol Processor
- Optional Link Subsystem hardware

The Protocol Processor module is responsible for maintaining the radio link between the test set and the mobile station under test. The primary tasks of the Protocol Processor module are:

- Generating the protocol messaging necessary for the forward channel and sending that protocol stream to the test set's RF source for transmission to the mobile station
- Decoding the protocol messaging received from the mobile station under test on the reverse channel
- Computing measurement results which are associated with data bits contained within the mobile stations messaging, such as bit error ratio and frame error rate.

Block Diagram

The optional Link Subsystem hardware provides additional signaling link control for CDMA signaling formats. These include:

- Layer 1 digital signal processing
- Providing I/Q baseband signals which are sent to the I/Q modulator in the RF Source

Analog To Digital Converter Module

Following the Measurement Downconverter and Demodulation Downconverter IF 1 is the Analog to Digital Converter module. The purpose of the Analog to Digital Converter module is to convert the downconverted analog signals into digital data streams which can be processed by the Digital Signal Processing module.

In order to maintain the radio link of non-CDMA formats, the downconversion path through the Demodulation Downconverter module has a dedicated A/D conversion path.

To optimize measurement throughput, the fast RF power detector also has a single dedicated A/D path. This allows power measurements, in many cases, to be made concurrently with other measurements. The two outputs from the Measurement Downconverter module and the Audio In signal share a single multiplexed A/D path.

The outputs of the various analog to digital converters on the Analog to Digital Converter module share a common data bus with the Digital Signal Processing module.

Digital Signal Processing Module

The Digital Signal Processing (DSP) module is responsible for a variety of tasks within the overall test set architecture. These tasks are:

- demodulating data from the radio under test (data received from the Demodulation Downconverter module) and sending the demodulated data bits to the Protocol Processor module
- for some systems, perform audio measurements using audio information sent to the DSP module from the Protocol Processor module
- execute a variety of signal processing algorithms to perform measurements on the radio system of the currently loaded TA (data received from the power detector ADC, the measurement ADC and, in some cases, data received from the Demodulation Downconverter ADC)

The DSP processor communicates with the Host Processor and the Protocol Processor, as well as controlling the configuration and synchronization of the Analog To Digital Converter module.

Host Processor Module

The Host Processor module is responsible for a variety of tasks within the overall test set architecture. These tasks include:

- control of the manual user interface (MUI)
- executing commands and processing data received from the LAN interface
- executing commands and processing data received from the GPIB interface
- controlling hard disk access
- control of all RF and audio hardware modules
- routing measurement results received from the Digital Signal Processing and Protocol Processor modules to the appropriate output device (display, GPIB, LAN, serial, etc.)

Voltmeter/Counter

Voltmeter The voltmeter is used to measure internal voltages for instrument self-diagnostics.

Frequency Counter The Frequency Counter is used to measure external frequencies from the front panel Audio IN, High or Low BNC connectors, and to measure internal signals for diagnostics. The external input can receive a signal between 20 Hz and 50 MHz, with a level from 25 mV to 8 V rms.

Audio Section

Audio Analysis Path Externally applied audio signals can be analyzed through the test set's DSP module for such characteristics as AC level, SINAD, or distortion.

The audio signal to be analyzed is input to the test set using the front panel Audio IN High/Low connectors. The signal is then routed to the Analog To Digital Converter module's measurement sampler for analysis by the DSP module.

The Audio In connector accepts signals from 20 Hz to 15 KHz, at input levels from 10 mV to 20 V peak.

Audio 1 Path The Audio 1 path provides analog baseband signals used for frequency modulation of the test set's RF sources. Up to four separate audio sources may be summed together in any combination to provide the composite Audio 1 output. These include the external FM input, internal direct digital synthesis (DDS,) regenerated SAT, and audio echo input.

The external FM input accepts an externally supplied audio signal with a peak voltage between 0.25 and 2 V peak.

The internal DDS generates low distortion audio signals from DC to 20 KHz with 0.1 Hz resolution. One to four signals may be generated and internally summed, with independent level control of each waveform.

The SAT regeneration circuit outputs a signal which is phase-locked to a received SAT signal. This is useful for testing situations where the test set needs to emulate a mobile station.

The audio echo input is used for retransmitting the received audio after a selectable time delay, to check both radio transmit and receive paths simultaneously.

For most applications, only one or two of these Audio 1 path sources are enabled at any given time.

Block Diagram

Audio 2 Path The Audio 2 path provides a secondary means for sending analog baseband signals to the FM modulator. Audio 2 contains only one source, a DDS similar to that used for Audio 1.

Typically, the Audio 2 path DDS is used for cases where multiple signals must be summed together with the lowest possible distortion. Another potential use of Audio 2 would be to obtain higher output levels than Audio 1 is capable of (up to twice as much), assuming the two outputs are set to the same frequency and phase, and then summed together at the Baseband Generator module.

Audio 2 is rarely used in practice because the DDS used for Audio 2 is the same DDS that is used for the front panel audio output.

Audio Out Path Any one of four inputs may be coupled to the front panel audio output connector. These include a 4 channel DDS (shared with Audio 2), receiver discriminator audio from the Demodulation Downconverter module, audio echo from the Analog To Digital Converter module, and audio vocoder.

The front panel output is capable of providing signal levels up to 9 V peak into > 600 ohm loads, and up to 0.8 V peak into an 8 ohm load (e.g. speaker). The output level is calibrated for all modes except discriminator audio,

The discriminator audio has an uncalibrated volume control provided due to the high tolerances involved.

Typically the DDS mode is used to feed the MIC input of a radio, or it may simply be used as a general purpose low distortion function generator.

Audio echo can be selected to route the received audio to the front panel audio output connector.

RF Sources

The test set has up to two identical RF sources. The RF sources are used to provide analog or digitally modulated RF carriers for use in parametric testing of mobile stations encompassing a variety of cellular radio formats. In general, the sources have a frequency range of 292 MHz to 2.7 GHz and an amplitude range of -10 dBm to -127 dBm.

The RF sources consist of a Synthesized Signal Generator module followed by a Vector Output module and an RF Attenuator module. Baseband modulation information is supplied to the RF sources from a Baseband Generator module preceded by an Audio Section module.

Baseband Generators

The purpose of the Baseband Generator module is to provide, for the modulation type currently in effect, properly formatted baseband signals to the modulation circuits on the RF Source modules.

The Baseband Generator performs several functions related to the generation and processing of these base-band modulation signals. These are:

- Transform data and clock signals from the Protocol Processor module into base-band analog I/Q modulation signals for the I/Q modulator in the Vector Output module
- Transform data from the Protocol Processor module into baseband FSK modulation for the FM modulator in the Signal Generator module
- Provide baseband FM path source selection, gain adjustment and summing node for analog FM signals from the Audio module and internally generated baseband FSK signals which are output to the FM modulator in the Signal Generator module
- Transform burst and adjacent timeslot signals from the Protocol Processor module into baseband burst modulation signals for the burst modulator in the Vector Output module

Configuration

Obtaining Identification Information (*IDN)

Description

Test set information is returned from a *IDN? query. The *IDN? query provides information about the Manufacturer, Model Number, Serial Number, and Firmware Revision. *IDN? is defined in IEEE Std. 488.2-1992, 10.14.

Test Set Information

*IDN? query returns identification information as a comma separated string.

```
DIM A$[100]
OUTPUT 714;"*IDN?" !returns manufacturer,model number, serial number and "0"
                !separated by commas
ENTER 714;A$
PRINT A$          !prints, for example "Agilent Technologies, 8960 Series 10 E5515B,
                !US38020105,0
```

- Agilent Technologies is the manufacturer.
- Printable ASCII characters excluding comma and semicolon up to a 25-character string.
Model number example: 8960 Series 10 E5515B
- Printable ASCII characters excluding comma and semicolon up to a 10-character string.
Serial number example: US00000123
- Printable ASCII characters excluding comma and semicolon up to a 20-character string.
Firmware revision example: 0

NOTE The *IDN? query will always indicate that the firmware revision is zero.
 SYSTEM:APPLICATION[:CURRENT]:REVISION? is the recommended way to query the firmware
 revision.

Related Topics

[“Hardware Configuration Report”](#)

Hardware Configuration Report

Description

You can generate a list of the test set's hardware configuration over the LAN or GPIB.

The LAN query is the easiest and most direct way to query the test set's hardware configuration. This method uses your web browser to display a formatted report.

The GPIB query returns an unformatted character string that must be buffered and saved to an HTML file to provide formatted text.

LAN Query

1. Refer to the SYSTEM CONFIG screen to determine the LAN address.
2. Open a web browser and enter <LAN address>/iconfig. For example, if your LAN address is 130.2.2.147, you would enter:
130.2.2.147/iconfig
3. The web browser will then display formatted text. A partial list of the hardware configuration information is shown below:

<p>Agilent Technologies 8960 Series 10 E5515A</p> <p>Serial Number: US00000097</p> <p>Current Test Application: E1960A, GSM Mobile Test, A.04.01</p> <p>Instrument Options Installed: RF Source 2</p> <p>HOST BOOT ROM REV: A.02.03_BOOT PROTOCOL BOOT ROM REV: MOM_PROTOCOL_BSP_1.7 DSP BOOT ROM REV: A.00.01</p>
--

GPIB Query

Use the following Basic example as a model to store the test set's configuration as an HTML file.

GPIB Example:

```

10  DIM Buf1$(20000),Buf2$(20000) ! This is the minimum space for the arrays
20  OUTPUT 714;"SYSTEM:CONFIGURE:INFORMATION:HARDWARE:VERBOSE?"
30  ENTER 714;Buf1$,Buf2$
40  CREATE "HW.htm",1           ! Create an HTML file
50  ASSIGN @File TO "HW.htm"
60  OUTPUT @File;Buf1$,Buf2$
70  END

```

Hardware Configuration Report

In the future, the hardware configuration report may increase in length. More space would then need to be allocated for the arrays.

Display the HTML file using a web browser or HTML text editor.

Related Topics

[“SYSTEM:CONFIGure:INformation:HARDware:VERBose?” on page 392](#)

[“Obtaining Identification Information \(*IDN\)” on page 492](#)

W-CDMA Revision Information

This document describes the features that are in the Agilent Technologies E1963A WCDMA Mobile Test Application releases. This document contains the original features, as well as enhancements that have been added over time.

Select the appropriate link below to view the required release.

- [“A.01. 00 release - November 2001 \(Initial Test Application Release\)”](#)

A.01. 00 release - November 2001 (Initial Test Application Release)

Call Processing

This release of the W-CDMA test application does not provide call processing. Therefore, call processing operations, such as base station origination (paging) and registration, are not available to establish a connection between the test set and the user equipment (UE).

A frequency division duplex (FDD) test mode is available to provide a downlink signal that a properly configured UE can synchronize to in order to transmit a corresponding uplink signal. The test set can then demodulate the uplink signal and make waveform quality and loopback bit error ratio measurements. See [“FDD Test Operating Mode”](#) for a description of this feature.

Transmitter Measurements

- **Thermal Power.** This is an unfiltered, broad-banded power measurement that uses a thermal detector to measure the total power of all signals present at the test set's RF IN/OUT connector down to -10 dBm. Because of its high accuracy, this is the preferred power measurement for the *Maximum Output Power* test (3GPP TS 34.121, section 5.2, v3.2.0) to verify that the UE is transmitting at the correct level when transmitting at its highest output level. See [“Thermal Power Measurement Description”](#).
- **Channel Power.** This is a filtered power measurement that can be used to measure high level and low level signals within a 3.84 MHz bandwidth. This measurement is used in the *Transmit Off Power* test (3GPP TS 34.121, section 5.5.1, v3.2.0). It can also be used for calibrating mobile TX power. These tests require specific power levels to be measured within the 3.84 MHz channel bandwidth. See [“Channel Power Measurement Description”](#).
- **Adjacent Channel Leakage Ratio.** Power is measured within a 3.84 MHz bandwidth at +/-5 MHz and +/-10 MHz offsets from the center frequency. The measurement results can be displayed in either numeric and graphical formats. This measurement is defined in 3GPP TS 34.121, section 5.10, v3.2.0, *Adjacent Channel Leakage Power Ratio (ACLR)*, which verifies that the mobile station is not transmitting too much power outside of its 3.84 MHz channel bandwidth, which could interfere with other frequency channels. See [“Adjacent Channel Leakage Ratio Measurement Description”](#).
- **Waveform Quality.** This measurement returns the composite error vector magnitude (EVM), frequency error, origin offset, phase error, and magnitude error of the received signal. This measurement is used for the *Error Vector Magnitude (EVM)* test in 3GPP TS 34.121, section 5.13.1, and for the *Frequency Error* test in 3GPP TS 34.121, section 5.3, v3.2.0. These measurements verify the accuracy of the transmitter's modulation circuitry and RF source. For this FDD test mode release, this measurement can only be performed on a 12.2 kbps reference measurement channel (RMC) that is synchronized to the downlink signal from the test set. See [“Waveform Quality Measurement Description”](#).

Receiver Measurements

- Loopback bit error ratio (BER). This measurement uses the UE in loopback mode 1 to test the sensitivity of its receiver. The receiver sensitivity test is described in 3GPP TS 34.121, section 6.2, *v3.2.0, Reference Sensitivity Level*. When using the test set's FDD Test operating mode, the user must configure the UE in the loopback mode 1 to perform this measurement; no provision is made to send messages over the downlink signal to the UE to configure it. See [“Loopback Bit Error Ratio Measurement Description”](#).

Other Features

Base Station Emulation in FDD Test Operating Mode Base station emulation for this release is limited to sending a configurable downlink signal that the UE can synchronize to in order to transmit a corresponding uplink signal. The downlink does not send any commands to the UE to configure it for testing. All control of the UE must be provided by the user.

Downlink signal parameters that can be configured include the following settings:

- Downlink channel codes:
 - Primary Scrambling Code
 - PICH Channelization Code
 - DPCH 12.2 RMC Channelization Code
- Downlink channel levels:
 - FDD Test CPICH Level
 - FDD Test P-CCPCH/SCH Level
 - FDD Test PICH Level
 - FDD Test DPCH Level
- Orthogonal Channel Noise Simulator - OCNS is automatically turned on and off, and the level set, as the downlink channel levels are changed. See [“Orthogonal Channel Noise Simulator \(OCNS\)”](#).
- Additive White Gaussian Noise (AWGN)
- Downlink Transport Format Combination Indicator (TFCI)
- Downlink channel
- Downlink DTCH data type
- Downlink PICH data pattern

Power control bit patterns can also be configured on the downlink. This allows you to vary the value being sent for the uplink closed loop power control data, and to send step up and step down power control sequences.

CW Operating Mode CW operating mode provides an unmodulated RF generator signal with an adjustable level from -10 dBm to -127 dBm.

Adjusting the Brightness of the Test Set's Display

Description

This parameter allows you to adjust the brightness of the test set's display. The test set's display screen has two brightness settings:

- medium brightness
- high brightness

Example

```
OUTPUT 714;"DISPLAY:BRIGHTNESS MEDIUM" ! sets screen brightness to medium.
```

Related Topics

["DISPlay"](#)

["Display Backlight Dimming"](#)

Display Mode (Track/Fast)

Description

There are two display modes to select from when operating the test set remotely.

- Display mode fast
- Display mode track

Fast Mode

When operating remotely, there is often no need for the display to be updated as measurements are made. Using the fast display mode will increase the speed of the test set when it is operated remotely.

Fast mode is designed for remote use only. The test set returns to track mode if you change to manual operation.

- No screen or menu items are visible (except error messages).
- Error messages will be displayed in their normal location.
- “This instrument is being operated remotely” will be displayed at the bottom of the screen.

Example

```
OUTPUT 714;"DISPLAY:MODE FAST" !Selects fast mode
```

Track Mode

The track display mode is used to allow users to see what the test set is doing while it is being controlled remotely. Track mode is the default mode of the test set.

- Any changes made remotely will be updated on the screen if that screen is displayed.
- The error message window will be displayed as required when an error occurs.

Example

```
OUTPUT 714;"DISPLAY:MODE TRACK"!Selects track mode
```

Writing Messages to the Display

The capability to write up to four 30-character lines of text to the front panel display for operator messages is available when the display is in “[Fast Mode](#)”. This feature can be used to control the flow of software running on an external controller by pressing softkeys on the test set’s front panel.

For example, by displaying a message that prompts the operator to press a front panel softkey and then monitoring that softkey through status register bits, the programmer can design code that starts measurements, stops measurements, or branches to a selected routine or function without the need for access to the external computer’s keyboard.

The GPIB commands for writing messages to the display are found in the “[DISPlay:OPERator:MESSAge](#)” table.

The status bit register GPIB commands and bit definitions for monitoring the test set's sofkeys are found in the [“STATus:OPERation:KEYPressed Register Bit Assignments”](#) table.

Related Topics

[“DISPlay”](#) on page 220

[“STATus:OPERation:KEYPressed Register Bit Assignments”](#) on page 332

Test Set Beeper

Description

This parameter allows you to change the beeper state to on or off. A beep will indicate error conditions caused during manual or remote operation of the test set.

A 100 ms, 1.24 kHz audible tone (beep) is generated when an error message is logged and the beeper state is set to on. If two errors are generated in quick succession, two beeps are generated to indicate that more than one error has been logged.

The beeper state can be manually set in the Instrument Setup window found in the SYSTEM CONFIG screen.

Example

```
OUTPUT 714;"SYSTEM:BEEPER:STATE OFF"
```

Related Topics

["SYSTEM:BEEPer" on page 387](#)

["Error Messages" on page 456](#)

Timebase Description/Configuration

Description

The time base source is selected by the test set, either an internal time base or an external source (if a suitable signal is detected) is used as the reference oscillator. If a 10 MHz +/- 100 ppm signal, that has an input level from 0 to +13 dBm is connected to the 10 MHz REF IN connector on the rear panel, the test set will automatically select the external timebase.

You can read the status window at the bottom of the test set display for the EXT REF indicator, or query the test set to verify if it is using an external time base or an internal time base. You may also query the test set to verify if the time base is locked. The reference oscillator functionality is controlled through the SYSTEM subsystem.

Example:

```
OUTPUT 714;"SYSTEM:ROSCILLATOR[:TIMEBASE]?" !returns INT or EXT
                                                !(internal or external) timebase.
OUTPUT 714;"SYSTEM:ROSCILLATOR:LOCKED?" !returns 1 or 0 (locked or unlocked)
                                                !condition for timebase
```

Related Topics

["SYSTem:ROSCillator"](#)

["Rear Panel Connectors"](#)

Configuring the Test Set's LAN

Description

LAN IP Address

The LAN address is a character string with a maximum of 15 characters and a format of A, B, C, D, where A is between 0 and 223, and B, C, and D are between 0 and 255. No embedded spaces are allowed. The address may be manually set/viewed in the system configuration screen. The LAN address can be set/queried using the SYSTem subsystem.

The LAN address is a non-volatile parameter. The LAN address is not affected by any reset operation and can only be changed by direct access to the parameter itself.

NOTE If the LAN address is set to a different network class, the subnet mask will change to the default net mask for the new network class.

For convenience the DATA port on the front panel may be configured as a LAN port. When a RJ45 jumper cable, (part number E5515-61160) is connected from the LAN PORT on the rear panel, to the ETHERNET TO FRONT PANEL port also on the rear panel, the user has LAN access from the front panel of the test set. Without the RJ45 jumper cable, the test set connection to a LAN is the rear-panel, LAN PORT connector.

LAN Default Gateway

The LAN router, (default gateway), is a character string with a maximum of 15 characters and a format of A, B, C, D, where A is between 0 and 223, and B, C, and D are between 0 and 255, no embedded spaces are allowed. If the default gateway is set to a format not allowed with the LAN address or the subnet mask that have been selected, the default gateway will be set to a null string, indicated by a blank field on the test set display. The address may be manually set/viewed in the system configuration screen. The LAN default gateway can be set/queried using the SYSTem subsystem.

The LAN default gateway is the address of a router that routes messages between networks and or subnets. If this value is not specified, LAN communications will be limited to the network and subnet specified by the LAN IP address and the subnet mask. Your network administrator will know if a default gateway is needed and if so, the address of the router. If the default gateway address is not needed by your network, it may be disabled by entering any of the following values: "0" (zero), "" (null string), "0.0.0.0"

The LAN default gateway is a non-volatile parameter. The LAN default gateway is not affected by any reset operation and can only be changed by direct access to the parameter itself.

LAN Subnet Mask

The LAN subnet mask address is a character string with a maximum of 15 characters and a format of A, B, C, D, where A, B, C, and D are between 0 and 255. No embedded spaces are allowed. The address may be manually set/viewed in the system configuration screen. The LAN subnet mask address can be set/queried using the SYSTem subsystem.

The subnet mask number combined with the IP address identifies which network and subnet your computer is on. Contact your system administrator for the correct subnet mask for your network.

The subnet mask determines the boundaries between the subnet ID and the host ID.

The LAN subnet mask is a non-volatile parameter. The LAN subnet mask is not affected by any reset operation and can only be changed by direct access to the parameter itself.

NOTE If the LAN address is set to a different network class, the subnet mask will change to the default net mask for the new network class.

The subnet mask number is obtained from your network administrator.

Related Topics

[“SYSTem:COMMunicate”](#)

Configuring the Test Set's GPIB

Description

The GPIB address is an integer between 0 and 30. The test set comes with a default address of 14 and may be set/queried using the `SYSTEM` subsystem or manually through the system configuration screen by selecting the parameter and changing the number with the knob or the keypad.

The GPIB address is a non-volatile parameter. The GPIB address is not affected by any reset operation and can only be changed by direct access to the parameter itself.

Related Topics

[“SYSTEM:COMMunicate” on page 388](#)

Configuring System Time and Date

Description

The test set provides the following time and date settings:

- **Time**
This field provides entry of the local time in hours and minutes.
The Universal Coordinated Time field will track changes made to the Time field.
- **Date**
This field provides entry of the local date.
- **Universal Coordinated Time (UTC)**
Also known as Zulu, Greenwich Mean Time, or UCT, this field provides entry of universal time in hours and minutes.
The Time field will track changes made to the Universal Coordinated Time (UTC) field.
- **Universal Coordinated Time (UTC) Date**
- **Time Zone**
The Time Zone field provides entry of a time offset to the universal coordinated time (UTC). Based on each new time zone setting and the current UTC, a new local time value is calculated and automatically entered into the Time field.

These features are accessed by pressing the **SYSTEM CONFIG** hardkey followed by the Instrument Setup (**F1**) softkey.

Related Topics

[“SYSTEM:DATE”](#)

[“SYSTEM:TIME”](#)

[“SYSTEM:TZONE”](#)

[“SYSTEM:UTC”](#)

Test Application Switching

Description

Different radio formats (such as GSM, AMPS, CDMA 2000 or TIA/EIA 136) can be tested when the optional test applications are purchased from Agilent Technologies. The test set allows you to select a different test application and switch to it, a reboot makes the test application functional. The reboot will happen automatically when the you tell the test set to switch test applications. Switching to another test application takes about one minute.

Some radio formats are combined as fast switching test applications. Switching formats in a fast switching test application takes less than 2 seconds.

Test Application Switching GPIB Command

In order to switch to another test application use this GPIB command:

```
OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME 'GSM MOBILE TEST'"
```

Sending this command causes the test set to reboot.

Test Application Revision and Licensing

Each test application must have a valid license and revision to function. Licensed revisions of test applications are available from Agilent Technologies.

It may take several seconds before revision, model, and name information is returned.

Test Application Switching Programming Example

This program example shows you how to switch to the GSM test application.

1. Query the list of test application names to get exact spelling of the GSM test application. This is not necessary if you already know the exact name.
2. Query the test set to get a list of all revisions for "GSM Mobile Test." This is not necessary if you are not changing revisions.
3. Select a revision of "GSM Mobile Test." This is required if you are changing revisions.
4. Select the GSM test application. This will switch test applications and cause the test set to reboot.

```
10  OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME?"
20  !Queries all of the test application names
30  ENTER 714;N$
40  PRINT "The CATALOG names that are loaded are ";N$
50  OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION? 'GSM MOBILE TEST'"
60  !Queries all revisions of GSM MOBILE TEST
70  ENTER 714;Cat_rev$
80  PRINT "The revisions for the GSM Mobile Test Application are ";Cat_rev$
90  OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION 'GSM MOBILE TEST','A.04.01'"
100 !Selects a revision
110 OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME 'GSM MOBILE TEST'"
```

```
120    !Switches the test application to GSM MOBILE TEST
130    END
```

Related Topics

[“Test Application Revisions and Licenses” on page 508](#)

[“SYSTEM:APPLICATION” on page 380](#)

[“SYSTEM:CURRENT:TA” on page 399](#)

[“Test Application Name” on page 510](#)

Test Application Revisions and Licenses

Description

Different revisions of the test applications in your test set provide different capabilities. The selected test application revision is loaded after the next test application switch or power cycle of the test set. Once you select a revision the revision does not change unless you select another revision.

You can query the selected revision, all available revisions, and the total count of available revisions for a selected test application. These queries are helpful when selecting revisions but are not usually necessary when switching test applications.

NOTE The Agilent E1960A GSM mobile test application revisions prior to A.04.00 do not support test application switching. If you select a revision prior to A.04.00 you will not have a path to switch back to later revisions.

If you accidentally switch to a non-supported revision, use the firmware upgrade process to load firmware with the correct revision.

Test Application Revision Queries and Commands

These are commands to query revision information or select a revision.

- To query a **selected** test application revision (running or not) use this GPIB command:

```
OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION? `AMPS/136 MOBILE TEST`"
```
- To query the revision of the test application **currently running** use this GPIB command:

```
OUTPUT 714;"SYSTEM:APPLICATION:CURRENT:REVISION?"
```
- To query **all** of the revisions available for a test application use this GPIB command:

```
OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION? `AMPS/136 MOBILE TEST`"
```
- To **select** a revision of a test application use this GPIB command:

```
OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION `GSM mobile test`,`A.04.01`"
```
- To query the number of revisions for a specified test application:

```
OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION:COUNT? `GSM MOBILE TEST`"
```

Test Application License Status Query

The test application license status can be queried for a particular test application and revision using the following GPIB query:

```
OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:LICENSE? 'GSM mobile test','A.04.01'"
```

This query returns one of the following:

- “LIC” - This revision of test application appears to have a LICense. The test application may have been developed before licensing and therefore needs no license.
- “NLIC” - This test application does not appear to have a license. Selecting a Not LICensed revision will result in an error +130.
- “PART” - Some PART of the test application does not appear to have a license.
- “UNKN” - This test application has UNKNown license status.

NOTE If you switch to a not licensed revision the test set will reboot to the SYSTEM CONFIG screen. You will be unable to select any other screen or make any measurements. Query or view the Test Application Setup menu to determine the licensed versions of test applications available.

Revision and license information can be viewed and selected from the SYSTEM CONFIG screen, by selecting the Test Application Setup menu. Revisions are shown with their license status. After the revision number is a letter. That letter indicates the revision license status; Licensed “L”, Not Licensed “N”, or Unknown “U”.

- “L” - This revision of test application appears to have a License. The test application may have been developed before licensing and therefore needs no license.
- “N” - This test application does not appear to have a license. Selecting a Not licensed revision will result in an error +130.
- “P” - Some Part of the test application does not appear to have a license.
- “U” - This test application has Unknown license status.

Related Topics

[“Test Application Switching” on page 506](#)

[“SYSTEM:APPLICATION” on page 380](#)

Test Application Name

Description

The following queries give you details about the test application name. To query or switch test applications you must use the test application name as it appears in the catalog (without regard to case).

- To query the name of the all test applications installed in the test set use this GPIB query.

```
OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME?"
```

- To query the name of the selected test application (running or not) use this GPIB query.

```
OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME?"
```

- To query the name of the currently running test application use this GPIB query.

```
OUTPUT 714;"SYSTEM:APPLICATION:CURRENT:NAME?"
```

- To query the number of test applications installed in the test set use this GPIB query.

```
OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME:COUNT?"
```

The test application names can also be displayed in the Test Application Setup menu on the test set's display.

Related Topics

["SYSTEM:APPLICATION" on page 380](#)

["Test Application Switching" on page 506](#)

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