Agilent Technologies E6900A Wireless Protocol Test Set
Agilent Technologies E6910A GPRS Protocol Application

Reference Guide

GPRS Protocol Application Revision A.01

1000-1839 (not orderable)

www.agilent.com/find/E6900/

Agilent Technologies

Notice

Agilent Technologies, Inc.
Learning Products Department
24001 E. Mission
Liberty Lake, WA 99019-9599
U.S.A.

Agilent Technologies

Edition/Print Date

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

June 2002 - E6910A GPRS Protocol 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.

ICES/NMB-001 - This is a symbol an Industrial Scientific and Medical Group 1 Class A product. (ICES-001 Issue 3).

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

Warranty Statement

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement will 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.com/find/products_services

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

United States of America:

Agilent Technologies	(tel) 1 800 452 4844
Test and Measurement Call Center	
P.O. Box 4026	
Englewood, CO 80155-4026	

Canada:

Agilent Technologies Canada Inc.	(tel) 1 877 894 4414
2660 Matheson Blvd. E	
Mississauga, Ontario	
L4W 5G1	

Europe:

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

Japan:

Agilent Technologies Japan Ltd.	(tel) (81) 456-56-7832
Measurement Assistance Center	(fax) (81) 426-56-7840
9-1 Takakura-Cho, Hachioji-Shi,	
Tokyo 192-8510, Japan	

Latin America:

Agilent Technologies	(tel) (305) 267 4245
Latin America Region Headquarters	(fax) (305) 267 4286
5200 Blue Lagoon Drive,	
Suite #950	
Miami, Florida 33126	
U.S. A.	

Australia/New Zealand:

Agilent Technologies Australia Pty Ltd.	*Australia*	*New Zealand*
347 Burwood Highway	(tel) 1 800 629 485	(tel) 0 800 738 378
Forest Hill, Victoria 3131	(fax) (61 3) 9272 0749	(fax) (64 4) 802 6881

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

Manufacturers Name: **Agilent Technologies, Inc.**

Manufacturers Address: 1400 Fountaingrove Parkway
Santa Rosa, CA 95403-1799
USA

Declares that the products

Product Name: Wireless Protocol Test Set

Model Number: E6900A

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

Conforms with the following product standards:

EMC: IEC 61326-1:1997+A1:1998 / EN 61326-1:1997+A1:1998

EMC	**Standard**	Limit
	CISPR 11:1997 / EN 55011:1998/A-1999	Group 1, Class A
	IEC 6100-4-2:1995+A1:1998/EN6100-4-2:1995	4kV CD, 8kV AD
	IEC 61000-4-3:1995 / EN 61000-4-3:1995	3 V/m, 80-1000 MHz
	IEC 61000-4-4:1995 / EN 61000-4-4:1995	0.5kV signal., 1kV power
	IEC 61000-4-5:1995 / EN 61000-4-5:1996	0.5 kV L-L, 1 kV L-G
	IEC 61000-4-6:1996 / EN 61000-4-6:1998	3V, 0.15-80 MHz
	IEC 61000-4-11:1994 / EN 61000-4-11:1998	1 cycle, 100%

Safety: IEC 61010-1:1990+A1:1992+A2:1995 / EN 61010-1:1993+A2:1995
CAN/CSA-C22.2 No. 1010.1-92

Supplemental Information:

The products herewith comply with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carry the CE-marking accordingly.

Santa Rosa, CA, USA ***24 June 2002***

Greg Pfeiffer/Quality Engineering Manager

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

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

Contents

Contents

1 Manual Operation

Protocol Logging

The Protocol Application enables the test set to capture the exchange of control and data information between the test set and a mobile station. Captured information is forwarded to a software application that runs on a personal computer (PC) under the Windows operating system.

The software application is referred to as the WPA, or "Wireless Protocol Advisor". It is tailored for the capture, display, and analysis of message exchange protocols between the test set, emulating a base station, and a mobile station.

IMPORTANT Most of the information necessary to establish a connection and to display, filter, store, print, and analyze the message exchange between the test set and a mobile station is accessible through the Help feature available on-line when the WPA application is running.

Additional information, including PC operating system requirements and additional protocol logging reference information specific to the test set's Protocol Application is listed below.

PC Operating System Requirements

Logging protocol messages requires an external PC with the following system requirements:

- "Protocol Logging Requirements" on page 26

Starting and Stopping Protocol Logging

There are several ways to control the logging of signaling messages.

The primary method for starting and stopping is through features found in the WPA software.

The following information describes features available through the test set's remote and manual user interface for performing these functions:

- "Activating Protocol Logging From the Test Set" on page 25

Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

Activating Protocol Logging From the Test Set

Once a connection is established between the PC running the WPA (Wireless Protocol Advisor) and the test set, a logging session can be activated (or deactivated) by selecting the start (or stop) softkey from the test set's front panel or by sending GPIB commands that perform the same functions:

NOTE The WPA software performs the same start/stop functions when the REC (RECord) button is selected. Refer to the WPA on-line Help for details.

Logging is available in the test set for all data connection types, including BLER, IP Data, and ETSI Test Modes A and B. Once a PC has connected its WPA software to the test set, it is possible to start logging at any time.

Test Set Control of Protocol Logging

If a PC with the WPA software has not yet connected with the test set, an error message will be generated. Exactly one PC/WPA can be connected to a test set at one time.

Front Panel Control of Protocol Logging

1. Press the **CALL SETUP** key to go to the Call Setup screen.
2. Press the **More** key on the left hand Control menu to go to screen 2.
3. Press `Protocol Logging` (**F1**).
4. Press `Start Protocol Logging` (**F1**) to begin logging.

Remote Control of Protocol Logging

The GPIB command to control Protocol Logging is CALL:PLOGging.

Triggering Signals for Logging

It is possible to enable external trigger signals from the test set. These triggers generate signals in relation to specific downlink protocol messages sent from the test set. The WPA software can be configured to trigger in conjunction with theses signals.

Related Topics

For more information about WPA, see the on-line help available in the software.

For more information about test set triggers, see “Protocol Event Trigger Output (PETO)” on page 76.

Protocol Logging Requirements

The Protocol Application enables the test set to log protocol messages. Protocol messages are forwarded to the Wireless Protocol Advisor (WPA) software, which is required for message display and analysis. This software is included with the protocol application and will run on PCs that meet the following system requirements:

Summary of Requirements for the Wireless Protocol Advisor

NOTE These requirements are subject to change or addition without notice. Always refer to the product web page for the latest information.

- PC Operating System:
  — Microsoft® Windows® 95 OSR2 version 4.00.95B
  — Microsoft® Windows® 95 OSR2 version 4.00.95C
  — Microsoft® Windows® 98 OSR2 version 4.10.2222A
  — Microsoft® Windows® NT 4 SP3/4/5
- 300 MHz Pentium recommended
- 128 M RAM recommended
- 250 M available disk space required for installation
- 100 M available disk space recommended for storing logged information
- Video resolution minimum 800 by 600 pixels with at least 256 colors
- LAN or WAN connectivity required to connect to the test set

Data Channel

Last updated: June 4, 2002

The Data Channel function allows you to use the test set as a router while you exchange IP datagrams between your DUT and the server. This feature is available only through the front panel and through the remote user interface (programming).

There are several applications of the Data Channel:

- “Ping” on page 28
- “WAP Test with the Data Channel” on page 33 (link your WAP device to a wml server)
- “Modem Functional Test with the Data Channel” on page 36 (e.g. to test a GPRS wireless modem, connect a PC with an html browser to the modem, and route the data through the test set to an html server)
- “FTP Throughput Test with the Data Channel” on page 39 (use FTP to transfer data to and from an FTP source)
- “Base Station Emulation with the Data Channel” on page 42 (use the test set as a router to transfer datagrams from your application to a wireless device)

Related Topics

“Protocol Logging and Data Channel Troubleshooting” on page 418

Ping

Ping Description

Ping is a tool to help check system interconnects. The test set has a Ping feature that allows you to ping either the DUT or another address. It sends a 64 byte IP datagram (technically an ICMP message: Internet Control Message Protocol) from the test set to the ping target, and expects a response, recording the response information on the test set's display. Of those 64 bytes, 56 bytes are of data and 8 bytes are of header information. This feature is controlled through the front panel or through GPIB control.

Ping is the simplest implementation of the Data Channel feature. If you are trying to debug a system that is not responding to a full network setup (for example a WAP setup), try pinging the DUT from a computer attached to the network. Experiment with very large packets, very long timeouts and continuous pings. (These ping options are not available with the ping from the test set.) You can actually create a large, continuous data transfer with just ping.

Ping Notes

- When pinging the DUT, the DUT must have at least requested a PDP Context.
- Ping is only available in IP Data mode.
- When the Ping originates from the test set and the target is the DUT, the Downlink Source address is always 130.29.181.203, and Uplink Destination Address is the same value.

To Ping the DUT From the Test Set

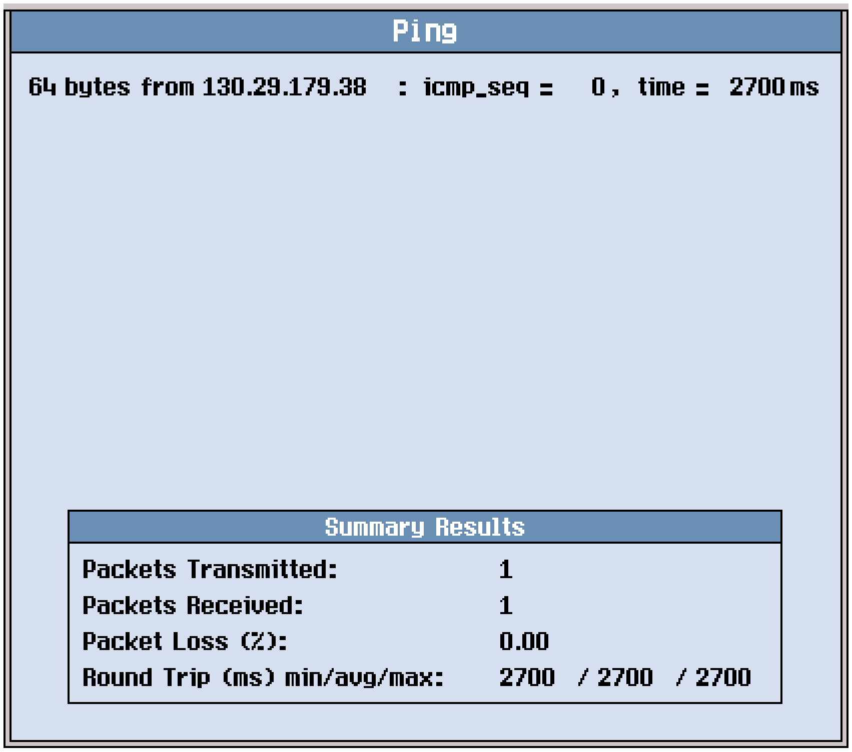
1. Press the **Call Setup** key.
2. Select `Data Conn Type` and set it to `IP Data`.
3. Press the **More** key to display the second page of the Control Menu.
4. Select `DUT PDP Setup`.
5. Set the DUT IP address.
6. Close the DUT PDP Setup menu.
7. Select `Ping`.
8. Select `Start Ping`.

To Ping an Alternate Address From the Ping screen:

1. Select `Ping Setup`.
2. Set the `Alternate Ping Address` to your desired target IP address.
3. Set `Device to Ping` to `Alternate`.
4. Select `Start Ping`.

How to Read the Ping Results

If the connection is good, then the device will return a packet to the test set and the packet transfer information is displayed on the test set's screen (see Ping Data Display). In this example, the Ping has been setup to ping only once. Note that it took 2700 msec to complete the ping.



Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

"Data Channel" on page 27

Protocol Logging During Ping

When ping data passes between the test set and the DUT, it can be logged. The log results during ping depend on the method used. Here are several methods and descriptions of the log results.

1. Ping the DUT from the test set.
2. Ping an alternate IP address from the test set.
3. In addition to the test set's ping feature, you can ping any IP address (including the DUT) from any network device with a ping feature.

Method 1: Ping the DUT From the Test Set

To ping the DUT from the test set, use the following procedure:

1. Press the **Call Setup** key.
2. Select Data Conn Type and set it to IP Data.
3. Press the **More** key to display the second page of the Control Menu.
4. Select `DUT PDP Setup`.
5. Set the DUT IP address.
6. Close the DUT PDP Setup menu.
7. Select `Ping`.
8. Select `Start Ping`.

A Ping data transfer may be successful as long as the DUT is either in an Active PDP Connection, or if the DUT has at least accepted a request (from the test set) to send a PDP Context Request. Some devices in early stages have been rejecting requests from the test set to do this, so it may be necessary to establish the PDP Context Activation before a successful Ping occurs.

If you use the test set's protocol logging to capture a log of this ping, you will note that the IP_Down IP_Datagram Source_Address for the datagram that contains the ping data is a fixed number (0x821DB5CB). This is an internal address the test set uses to originate IP traffic from the test set to the DUT.

Method 2: Ping an Alternate IP Address From the Test Set

To ping an alternate address from the test set, use the following procedure:

1. Press the **Call Setup** key.
2. Select Data Conn Type and set it to IP Data.
3. Press the **More** key to display the second page of the Control Menu.
4. Select `Ping`.
5. Select `Ping Setup`.
6. Set the `Alternate Ping Address` to your desired target.
7. Set `Device to Ping` to `Alternate`.

8. Select `Start Ping`.

No active PDP context is required for this ping.

If your Alternate Ping Address is anything but the DUT address, the test set's protocol logging will not log this ping, because the test set's logging only logs protocol between the test set and the DUT. If you have a network logging device on your LAN, it will show that the source IP address is the test set's LAN IP address. If your Alternate Ping Address is the DUT address, then the data can be logged by the test set, and the IP_Down IP_Datagram Source_Address for the datagram that contains the ping data is the same fixed number as in Method 1.

Method 3: Using Ping From Other Devices

Any device on the network that has a ping feature can ping any other device, including the DUT. For example, if you have a PC on the LAN that the test set is connected to, you can use ping from that PC to ping the DUT.

Example procedure of pinging the DUT from another device (e.g. a Windows PC):

1. Open a DOS window on the PC.
2. Type ping followed by the IP address of the DUT.
3. The ping should respond as normal.

You can use protocol logging in the test set to log the ping to the DUT. In this case, the IP_Down IP_Datagram Source_Address for the datagram that contains the ping data is not a fixed number, it is the IP address of your PC.

Ping Log

The following information can be determined from a log of a ping to the DUT:

- "IP_Down" indicates that this is a downlink message and is therefore passing from the test set to the DUT.
- Protocol is ICMP (Internet Control Message Protocol).
- Type is ECHO_MESSAGE, which is the instruction to the DUT to generate an ECHO_REPLY message.
- The timestamp for the first message is 0.0 seconds. The first IP_Up message has a timestamp, and the time difference between the two is approximately the same 2700 msec (this log shows 2699 msec, to be exact).
- The IP address of the DUT is the Destination_Address on the IP_Down IP_Datagram and is the Source_Address on the IP_Up IP_Datagram. The alternate address is an address within the test set that originated the Ping data packet.
- The Type, Code, Checksum, Identifier and Sequence Number are all listed.

Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

"Ping" on page 28

"Data Channel" on page 27

WAP Test with the Data Channel

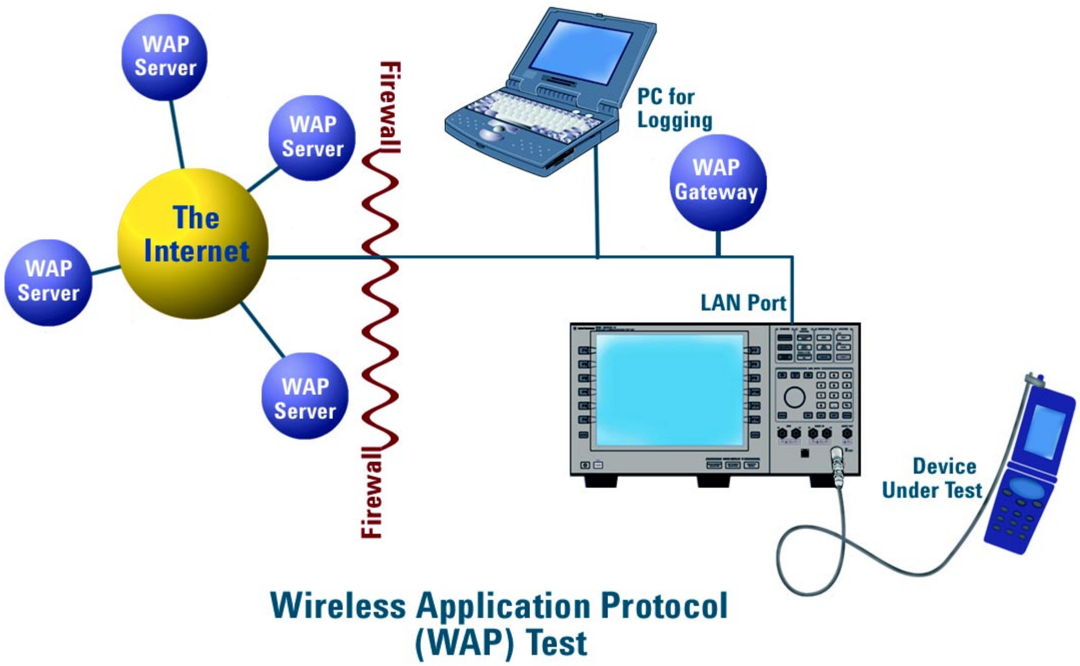
The Data Channel facilitates the functional test of a Wireless Application Protocol (WAP) device such as a WAP-enabled GPRS phone.

Logging data during this process provides protocol data at useful points in the stack, which may help in debugging the Device Under Test (DUT).

Before you use the Data channel for WAP, you must have the following information:

- an IP address valid for the subnet that you will connect the test set to
- the valid subnet mask for that subnet
- the default gateway for that network (not the same as the WAP gateway)
- a valid IP address for the DUT
- the default WAP gateway address (this may be required by the DUT)

A. Hardware Connections



Connect PC to LAN

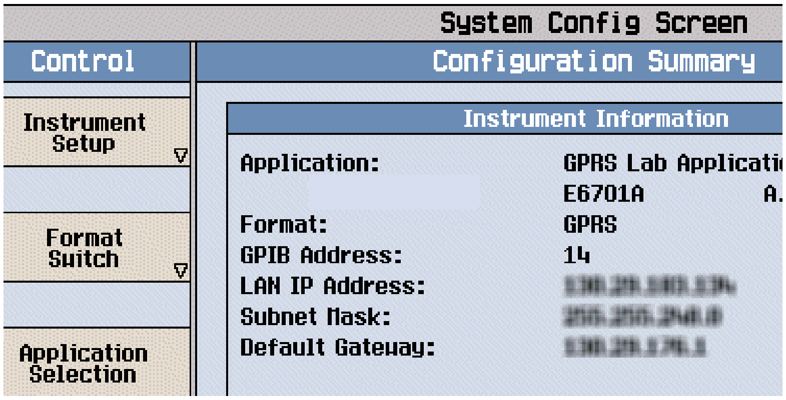
Please consult with your IT department if you need assistance connecting your PC to the LAN. Refer to "Protocol Logging" on page 23 for more information about setting up protocol logging.

Connect DUT, Test Set and LAN

1. Connect the LAN port on the back of the test set to your LAN.
2. Connect the DUT to the test set. There may be several ways to connect to the RF link of the DUT. The connection diagram shows a connection to the DUT's antenna.

B. Test Set and DUT Setup

Set Up Test Set



1. Press the **Sys Config** key to display the System Config screen.
2. Use the `Instrument Setup` softkey (**F1**) to display the Instrument Setup menu.
3. Enter the IP address for the test set.
4. Use the same menu to set the `Subnet Mask`.
5. Use the same menu to set the `Default Gateway`.
6. Press the **Call Setup** key to go to the Call Setup screen on the test set.
7. Select `Data Conn Type` and set the field to `IP Data`.
8. Press the left **More** key to go to the second screen of the Control menu.
9. Select `DUT PDP Setup` to open the DUT PDP Setup menu on the test set.
10. Set the DUT's IP address in the DUT PDP Setup menu on the test set.

NOTE The entered IP address must be on the same subnet as the test set.

Set Up DUT

1. You may need to set some network parameters in the WAP device (the DUT). Some typical parameters include a home page, Primary Port, or Data Bearer. Set these as needed.
2. You may also need to set a default WAP gateway (may be called Primary IP Address). Do this if necessary. Some network setups may require that the WAP gateway be on the same side of the firewall as the DUT and test set.

C. Data Connection

The objective of the WAP evaluation is to successfully transfer WAP datagrams. The DUT must complete a successful PDP Context activation before datagrams can be transferred. With the test set this involves two steps:

First, the DUT must perform a GPRS attach.

1. Connect the DUT to the RF IN/OUT port of the test set.
2. Turn the DUT on and wait for `Attached` to appear in the `Active Cell:` field on the test set's front panel display.

NOTE For DUTs that don't perform a GPRS attach automatically, you may have to set the DUT to data mode.

Second, the DUT must request a PDP Context Activation.

1. Use the DUT to initiate data transfers. The DUT will request an activation, the DUT's IP address will be assigned by the test set, and the PDP Context will be active.

   Additional Information:

   If the Network initiates a data transfer before the DUT has requested a PDP context, the test set will send a Request_PDP_Context_Activation message. No data will be sent to the DUT until a PDP Context has been activated.
2. This can be observed by looking for `PDP Active` in the `Active Cell Status:` field.

NOTE Logging is possible during Data Channel operation.

How do You Know When You Have Succeeded?

You have made a successful data connection if you can:

- Look at the WAP device and verify that the pages you were trying to transfer have actually transferred.
- See data transfer in both directions by observing the Counters field in the Call Setup screen.

Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

"Data Channel" on page 27

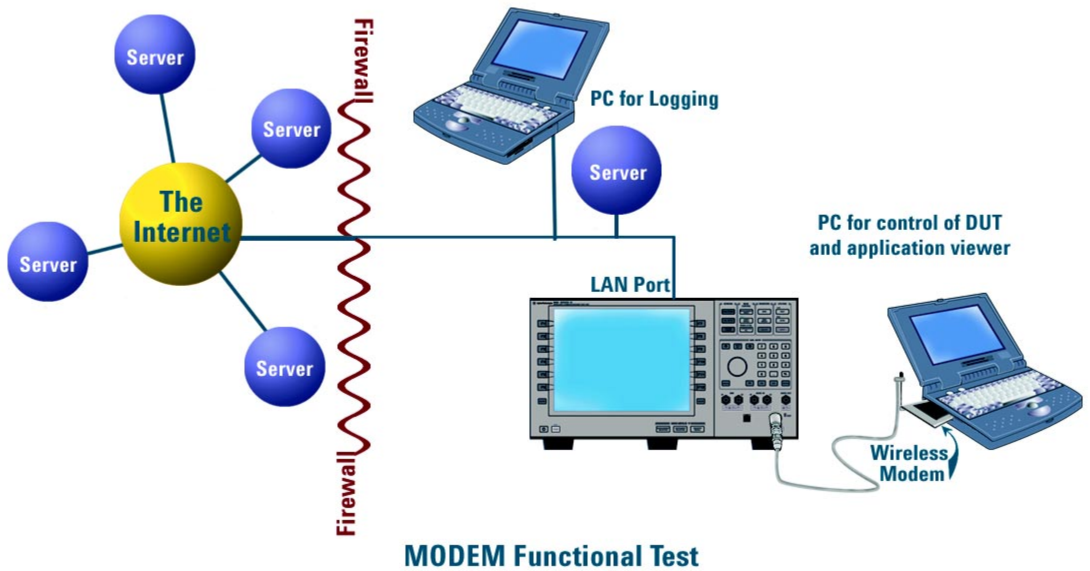
Modem Functional Test with the Data Channel

The Data Channel enables testing of wireless modems or GPRS devices with built-in modems, typically using dial-up connections. If the modem is not built-in, it is usually controlled from another device such as a PC.

Before you use the Data channel for modem testing, you must have the following information:

- an IP address valid for the subnet that you will connect the test set to
- the valid subnet mask for that subnet
- the default gateway for that network
- a valid IP address for the modem or its controlling PC (even though the modem is the Device Under Test (DUT), typically a PC will be assigned the IP address)

A. Hardware Connections



Connect Logging PC to LAN

Please consult with your IT department if you need assistance connecting your PC to the LAN. Refer to “Protocol Logging” on page 23 for more information about setting up protocol logging.

Connect Test Set to LAN

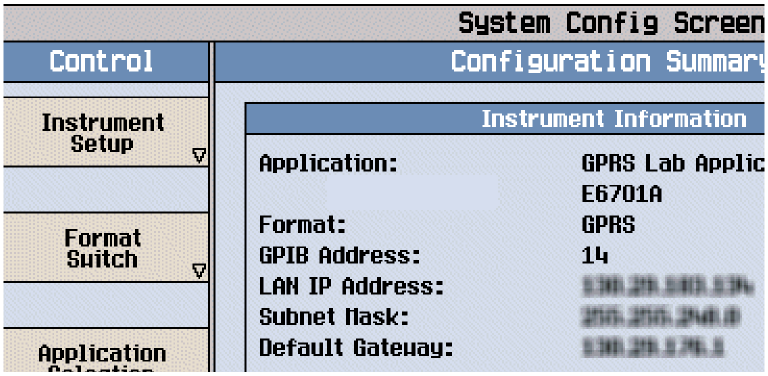
1. Connect the LAN port on the back of the test set to your LAN.

Connect DUT (Modem and Control PC) to the Test Set

1. Connect the modem to the PC as appropriate for your application.
2. Connect the DUT to the test set.

B. Test Set and DUT Setup

Set Up Test Set



1. Press the **Sys Config** key to display the System Config screen.
2. Use the `Instrument Setup` softkey (**F1**) to display the Instrument Setup menu.
3. Enter the IP address for the test set.
4. Use the same menu to set the `Subnet Mask`.
5. Use the same menu to set the `Default Gateway`.
6. Press the **Call Setup** key to go to the Call Setup screen on the test set.
7. Select `Data Conn Type` and set the field to `IP Data`.
8. Press the left **More** key to go to the second screen of the Control menu.
9. Select `DUT PDP Setup` to open the DUT PDP Setup menu on the test set.
10. Set the DUT's IP address (or the address of the controlling PC) in the DUT PDP Setup menu on the test set.

NOTE The entered IP address must be on the same subnet as the test set.

Set Up DUT

1. You may need to set the IP address or other network parameters in the controlling PC or the GPRS device. Set these as needed.
2. If using a dial-up connection, you may need to set up Dial-Up Networking in your PC. Do this as needed.

C. Modem Functional Test

In order to test the functioning of the DUT, it must first complete a successful PDP Context activation. With the test set this involves two steps:

First, the DUT must perform a GPRS attach.

1. Connect the DUT to the RF IN/OUT port of the test set.
2. Turn the DUT on and wait for `Attached` to appear in the `Active Cell:` field on the test set's front panel display. Some modems may need to attempt data transfer before it attaches to the test set. Sometimes the

modem will attach if the number *99# is dialed.

NOTE For DUTs that don't perform a GPRS attach automatically, you may have to set the DUT to data mode.

Second, the DUT must request a PDP Context Activation.

1. Use the DUT to initiate data transfers. The DUT will request an activation, an IP address will be assigned by the test set, and the PDP Context will be active.
2. This can be observed by looking for "PDP Active" in the Active Cell Status: field.

NOTE Logging is possible during Data Channel operation.

How do You Know When You Have Succeeded?

You have made a successful data connection if you can:

- Browse the Internet over the DUT.
- See data transfer in both directions by observing the Counters field in the Call Setup screen of the test set.
- Look at the DUT and its PC and verify that the data you were trying to transfer has actually transferred.

Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

"Data Channel" on page 27

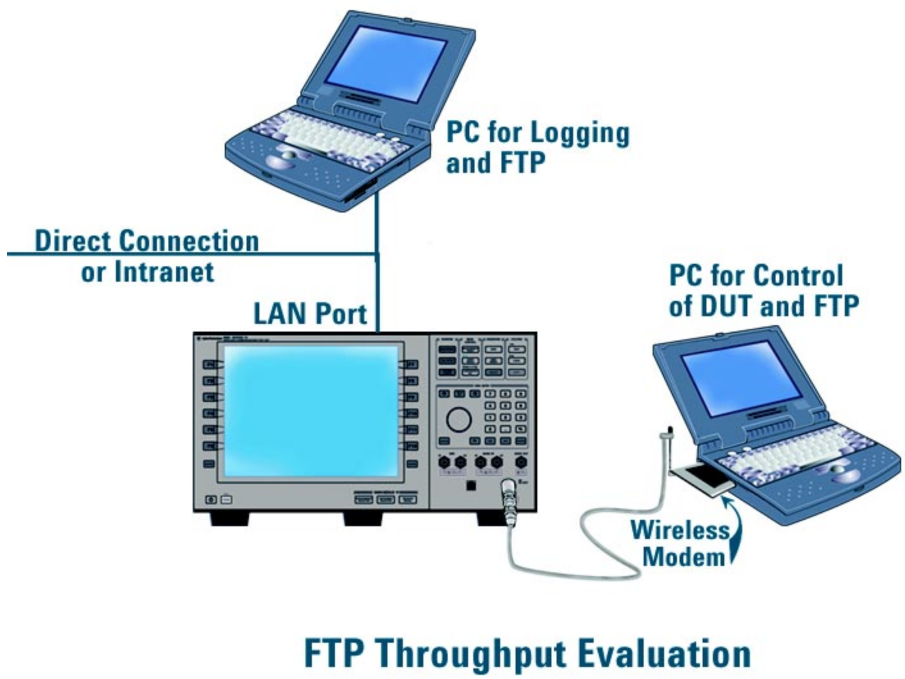
FTP Throughput Test with the Data Channel

The Data Channel facilitates file transfer (FTP) via the device. Typically this is done with a dial-up connection to an external PC using a GPRS PCMCIA modem or an external GPRS modem.

With appropriate evaluation tools on the Control PC, you can measure the throughput of the modem (DUT). Many commercial FTP programs provide detailed information on transfer speed.

To empirically measure the throughput, the performance of the network must be known. For this reason, it is not recommended to perform this evaluation while connected to the Internet. A “Direct Connection” or Intranet connection should be used instead.

A. Hardware Connections



Connect PC to LAN

Please consult with your IT department if you need assistance connecting your PC to the LAN. Refer to “Protocol Logging” on page 23 for more information about setting up protocol logging.

Connect Test Set to LAN

1. Connect the LAN port on the back of the test set to your LAN.

Direct Connection An alternate connection may be made using the Direct Connection method of connecting to the test set. This may be preferred, since it won’t be necessary to characterize the Intranet for the throughput evaluation.

Make the following connections:

FTP Throughput Test with the Data Channel

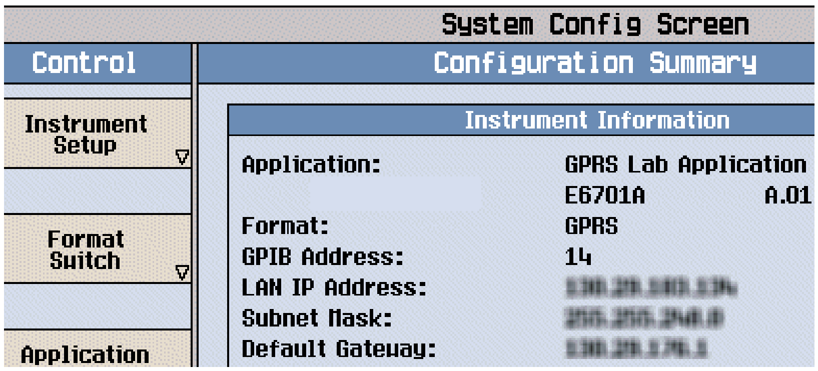
1. Connect the Logging PC directly to the LAN port of the test set using a crossover cable.
2. When setting up the test set and PCs (see “B. Test Set and DUT Setup” as below), set the IP addresses of the PCs and test set to any valid IP addresses, as long as they are on the appropriate subnets.

Connect DUT to the Test Set

1. Connect the modem to the PC as appropriate for your application.
2. Connect the DUT to the test set.

B. Test Set and DUT Setup

Set Up Test Set



1. Press the **Sys Config** key to display the System Config screen.
2. Use the `Instrument Setup` softkey (**F1**) to display the Instrument Setup menu.
3. Enter the IP address for the test set.
4. Use the same menu to set the Subnet Mask.
5. Use the same menu to set the Default Gateway.
6. Press the **Call Setup** key to go to the Call Setup screen on the test set.
7. Select `Data Conn Type` and set the field to `IP Data`.
8. Press the left **More** key to go to the second screen of the Control menu.
9. Select `DUT PDP Setup` to open the DUT PDP Setup menu on the test set.
10. Set the DUT’s IP address (or the address of the controlling PC) in the DUT PDP Setup menu on the test set.

NOTE The entered IP address must be on the same subnet as the test set.

Set Up DUT

1. You may need to set the IP address or other network parameters in the controlling PC or the GPRS device. Set these as needed.
2. If using a dial-up connection, you may need to set up Dial-Up Networking in your PC. Do this as needed.

C. Data Connection

In order to test the throughput of the DUT during active data transfer, the DUT and test set must first complete a successful PDP Context activation. With the test set this involves two steps:

First, the DUT must perform a GPRS attach.

1. Connect the DUT to the RF IN/OUT port of the test set.
2. Turn the DUT on and wait for `Attached` to appear in the `Active Cell:` field on the test set's front panel display. Some modems may need to attempt data transfer before it attaches to the test set. Sometimes the modem will attach if the number *99# is dialed.

NOTE For DUTs that don't perform a GPRS attach automatically, you may have to set the DUT to data mode.

Second, the DUT must request a PDP Context Activation.

1. Use the DUT or the server to initiate transfers. The DUT will request an activation, an IP address will be assigned by the test set, and the PDP Context will be active.
2. This can be observed by looking for "PDP Active" in the Active Cell Status: field.

NOTE Logging is possible during Data Channel operation, but it may affect throughput times.

How do You Know When You Have Succeeded?

You have made a successful data connection if you can:

- You see the data that was transferred on your DUT.
- Measure the throughput.
- See data transfer in both directions by observing the Counters field in the Call Setup screen of the test set.

Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

"Data Channel" on page 27

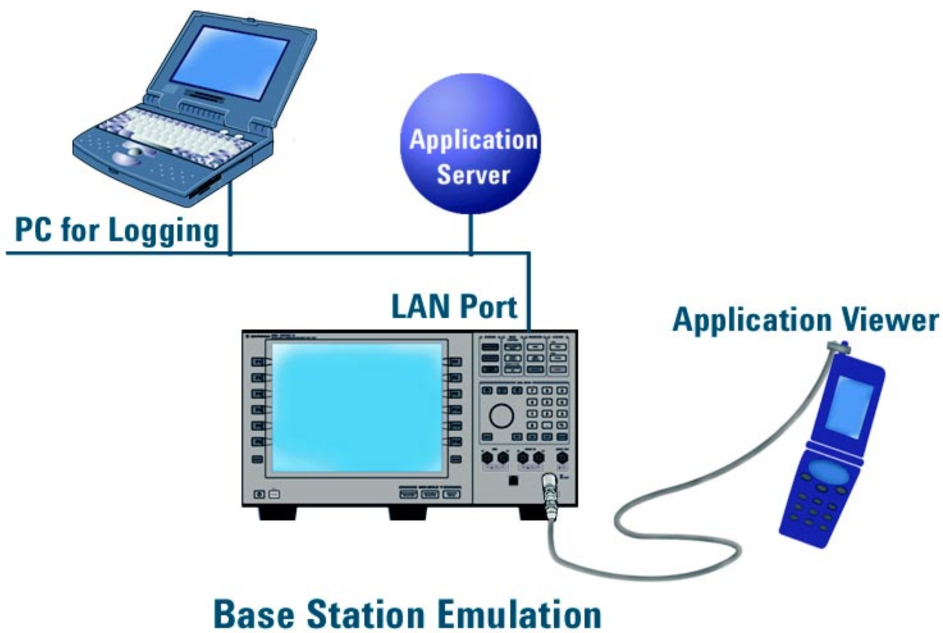
Base Station Emulation with the Data Channel

You can use the Data Channel and the test set to emulate a base station. This is particularly useful when you want to have a base station available, for example when demonstrating a wireless application, or when functionally testing wireless devices on a workbench. You may also want to vary key parameters of the cell, such as transmit power, and observe how the DUT performs.

Before you use the Data Channel for Base Station Emulation, you must have the following information:

- an IP address valid for the subnet that you will connect the test set to
- the valid subnet mask for that subnet
- the default gateway for that network
- a valid IP address for the DUT

A. Hardware Connections



Connect PC to LAN

Please consult with your IT department if you need assistance connecting your PC to the LAN. Refer to “Protocol Logging” on page 23 for more information about setting up protocol logging.

Connect Test Set to LAN

1. Connect the LAN port on the back of the test set to your LAN.

Direct Connection An alternate connection may be made using the Direct Connection method of connecting to the test set. This may be preferred, since it won’t be necessary to characterize the Intranet for the throughput evaluation.

Make the following connections:

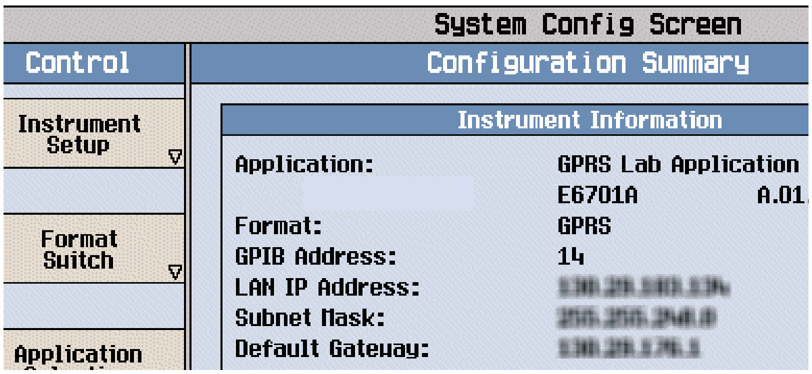
1. Connect the Logging PC directly to the LAN port of the test set using a crossover cable.
2. When setting up the test set and PCs (see “B. Test Set and DUT Setup” on page 43), set the IP addresses of the PCs and test set to any valid IP addresses, as long as they are on the appropriate subnets.

Connect DUT to the Test Set

1. Connect the DUT to the test set.

B. Test Set and DUT Setup

Set Up Test Set



1. Press the **Sys Config** key to display the System Config screen.
2. Use the `Instrument Setup` softkey (**F1**) to display the Instrument Setup menu.
3. Enter the IP address for the test set.
4. Use the same menu to set the `Subnet Mask`.
5. Use the same menu to set the `Default Gateway`.
6. Press the **Call Setup** key to go to the Call Setup screen on the test set.
7. Select `Data Conn Type` and set the field to `IP Data`.
8. Press the left **More** key to go to the second screen of the Control menu.
9. Select `DUT PDP Setup` to open the DUT PDP Setup menu on the test set.
10. Set the DUT’s IP address (or the address of the controlling PC) in the DUT PDP Setup menu on the test set.

NOTE The entered IP address must be on the same subnet as the test set.

Set Up DUT

1. You may need to set the IP address or other network parameters in the DUT. Set these as needed.
2. If the device uses a dial-up connection, you may need to set up Dial-Up Networking in the device. Do this as needed.

Base station emulation is ready. You can adjust the cell settings on the test set as desired. Most Cell Parameters require the BCH to be OFF (i.e. Operating mode = Cell Off) before adjusting the settings. Cell Power is an example of a setting that does not require BCH to be OFF. Changing Cell Power, however, or making ARFCN changes would force the DUT to re-camp.

To use Base Station Emulation to transfer data, you must make a data connection with the DUT as shown below.

C. Data Connection

The DUT must complete a successful PDP Context activation before datagrams can be transferred. With the test set this involves two steps:

First, the DUT must perform a GPRS attach.

1. Connect the DUT to the RF IN/OUT port of the test set.
2. Turn the DUT on and wait for `Attached` to appear in the `Active Cell:` field on the test set's front panel display.

NOTE For DUTs that don't perform a GPRS attach automatically, you may have to set the DUT to data mode.

Second, the DUT must request a PDP Context Activation.

1. Use the DUT or the server to initiate transfers. The DUT will request an activation, an IP address will be assigned by the test set, and the PDP Context will be active.
2. This can be observed by looking for "PDP Active" in the Active Cell Status: field.

NOTE Logging is possible during Data Channel operation.

How do You Know When You Have Succeeded?

You have made a successful data connection if you can:

- Look at the DUT and verify that the data you were trying to transfer has actually transferred.
- See data transfer in both directions by viewing the number of packets transferred in the Counters window of the Call Setup screen on the test set.

Related Topics

"Protocol Logging and Data Channel Troubleshooting" on page 418

"Data Channel" on page 27

Cell Parameter Enhancements

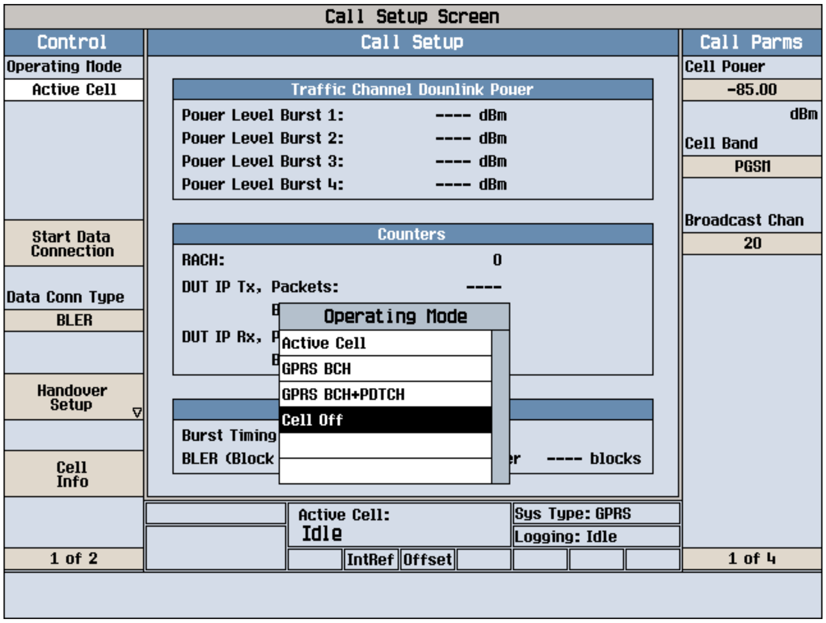
Several parameters can be controlled in the test set. Cell parameters can only be changed when the test set is not transmitting a BCH, so you will need to switch to Cell Off operating mode, or the changes will not take effect.

Table 1. Cell Parameter Settings

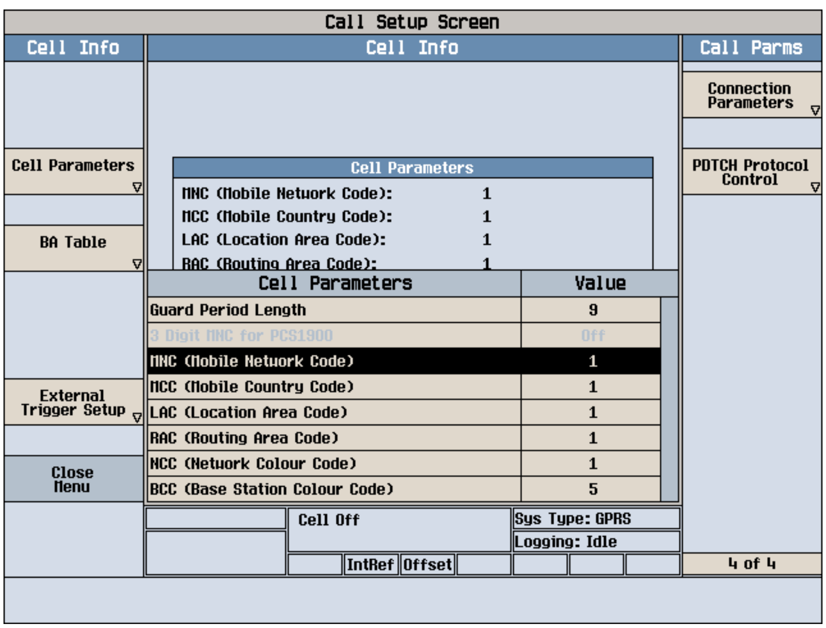
Parameter Name	Channel	Description	Range	Default Value
MCC	BCCH	Mobile Country Code	0-999	1
MNC (except 1900 MHz band)	BCCH	Mobile Network Code	0-99	1
MNC (1900 MHz band)	BCCH	Mobile Network Code	0-999	1
LAC	BCCH	Location Area Code	$0\text{-}2^{16}$	1
NCC	SCH	Network Color Code	0-7	1
BCC	SCH	Base Station Color Code	0-7	5
RAC	BCCH	Routing Area Code	0-255	1

How to Set Cell Parameters

1. In the Call Setup screen select `Operating Mode` (**F1**).



2. Set `Operating Mode` to `Cell Off`.
3. Select `Cell Info` (**F6**).
4. Select `Cell Parameters` (**F2**). Change the values as desired.



5. Set `Operating Mode` back to `Cell On`.

Uplink State Flag (USF)

Uplink State Flag (USF) is set in the Call Setup screen's Control Menu, Protocol Control, RLC/MAC layer.

1. Press the **Call Setup** key.
2. Press the left **More** key to advance the Control menu.
3. Select `Protocol Control`.
4. Select `RLC/MAC`.
5. Select `Allocation Control`.
6. Set `USF` as desired.

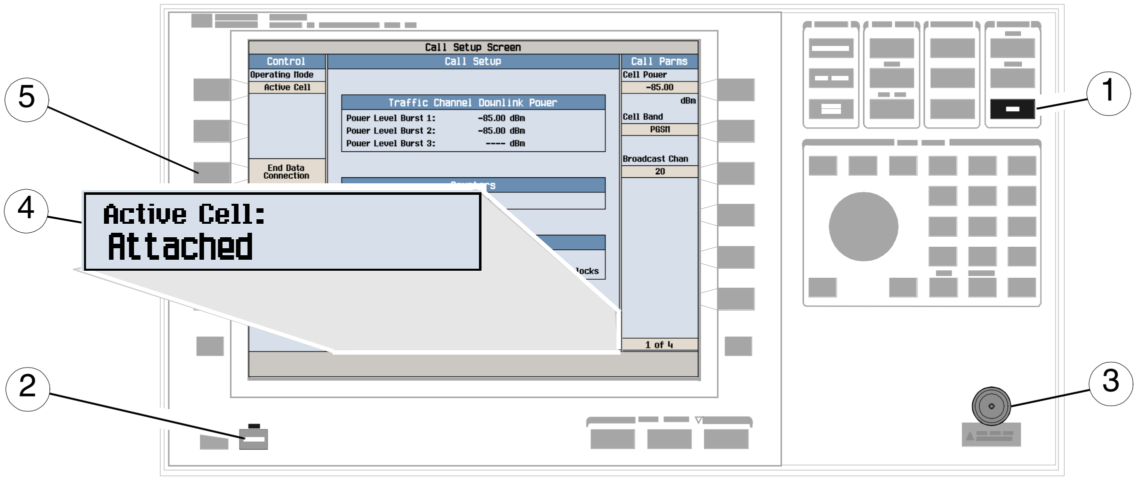
Uplink State Flag

The USF, or Uplink State Flag, allows the multiplexing of several wireless appliances onto a single uplink PDTCH. The USF value is sent to the DUT in a Packet Immediate Assignment message. USF is also sent in a Packet Uplink Assignment and Packet Timeslot Reconfigure message.

It can be used to determine that the DUT will transmit on the appropriate uplink block with several different USF numbers:

1. Establish a GPRS data link and start transferring data.
2. Change the USF value sent to the DUT via an assignment message.
3. Send the new USF value via an assignment message.
4. Verify that the DUT transmits on the block corresponding to the new USF.

How Do I Establish a Data Connection?



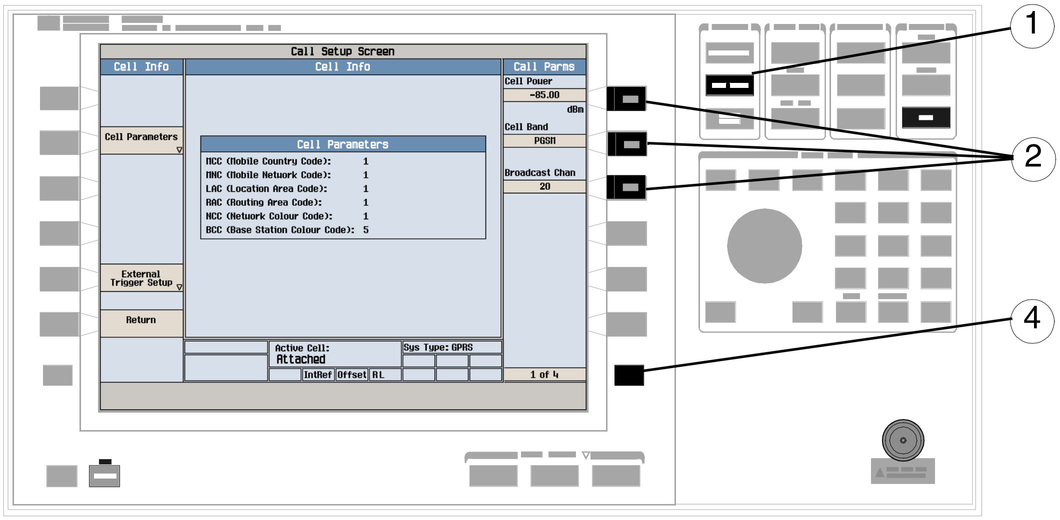
1. Press the blue **SHIFT** key.
2. Press the green **Preset** key.
3. Connect the mobile.
4. Turn the mobile on and wait for `Attached` in the `Active Cell:` field.

NOTE For mobiles that don't perform GPRS attach automatically, set the mobile to data mode.

---

5. Press the `Start Data Connection` (**F3**) key and watch for the `Active Cell:` field changing to `Transferring`.

How Do I Change Call Parameters?



1. Press the **CALL SETUP** key.

NOTE When the mobile is transferring data (`Active Cell:` field is `Transferring`) some call parameters cannot be changed.

---

2. On the Call Parms menu (1 of 3) press **F7**, **F8** or **F9**.
3. Enter a value or highlight a selection and press the knob.
4. Press the **More** key for additional call parameters.

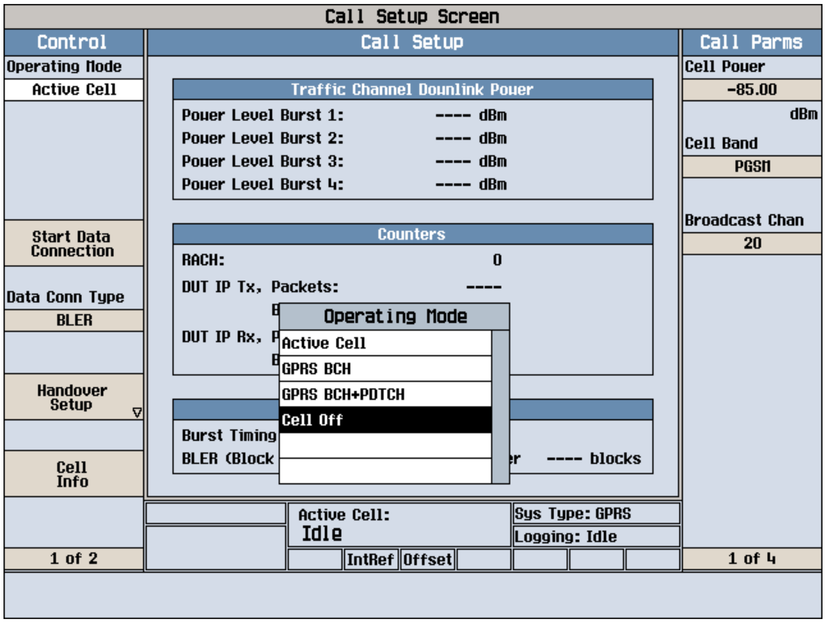
How Do I Change Cell Parameters?

NOTE You can change several cell parameters. Except Guard Period Length, all other cell parameters as shown in table below can only be changed when the test set is set to Cell Off operating mode. You can directly change the Guard Period Length by pressing the **CALL SETUP** key, then selecting `Cell Info` (**F6**), and then selecting `Cell Parameters` (**F2**).

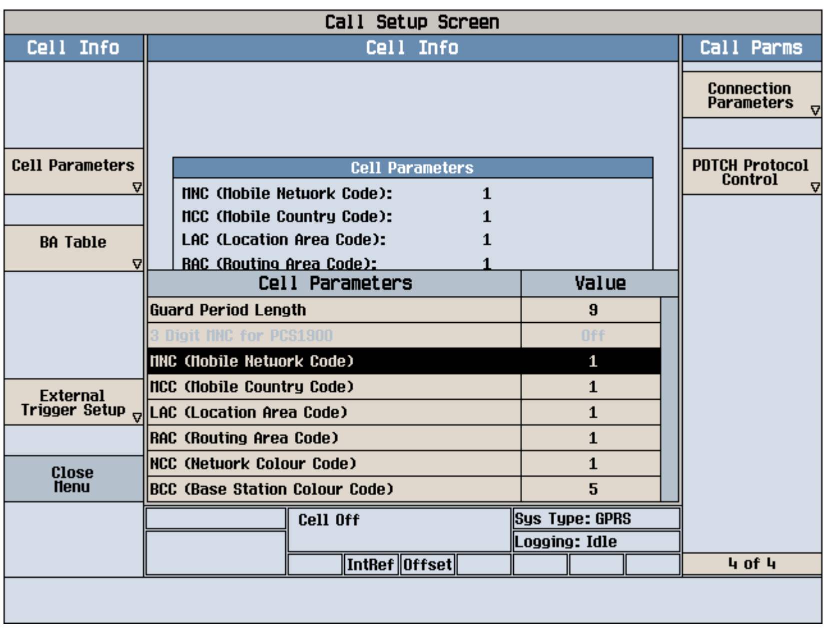
Table 2. Cell Parameter Settings

Parameter Name	Channel	Description	Range	Default Value
MCC	BCCH	Mobile Country Code	0-999	1
MNC (except 1900 MHz band)	BCCH	Mobile Network Code	0-99	1
MNC (1900 MHz band)	BCCH	Mobile Network Code	0-999	1
LAC	BCCH	Location Area Code	$0\text{-}2^{16}$	1
NCC	SCH	Network Color Code	0-7	1
BCC	SCH	Base Station Color Code	0-7	5
RAC	BCCH	Routing Area Code	0-255	1

1. Press the **CALL SETUP** key.
2. In the Call Setup screen select `Operating Mode` (**F1**).

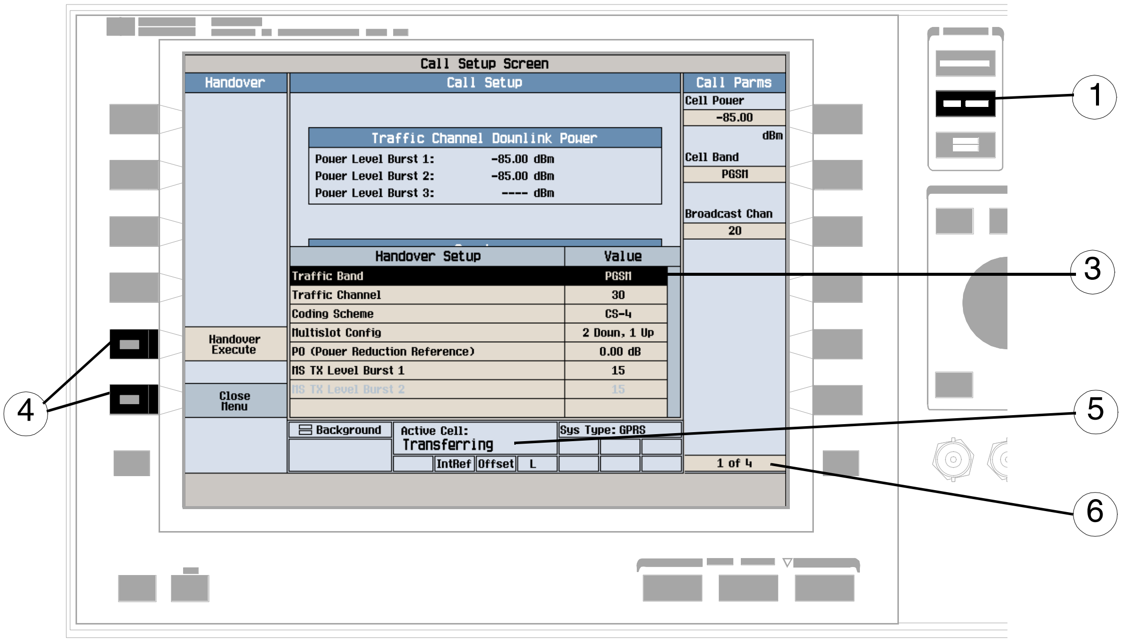


3. Set `Operating Mode` to `Cell Off`.
4. Select `Cell Info` (**F6**).
5. Select `Cell Parameters` (**F2**). Change the values as desired.



6. Set `Operating Mode` back to `Cell On`.

How Do I Perform a Handover?



1. Press the **CALL SETUP** key.
2. Press the `Handover Setup` (**F5**) key.
3. Change the various parameters, for example `Traffic Band`.
4. Press the `Handover Execute` (**F5**) key to complete the handover, or press the `Close Menu` (**F6**) key to abort the handover.
5. Check for `Transferring` in the `Active Cell:` field.
6. Press the **More** key to check that the changes have been implemented on the Call Parms menus (2 of 3) and (3 of 3).

How Do I Change the MS TX Level?

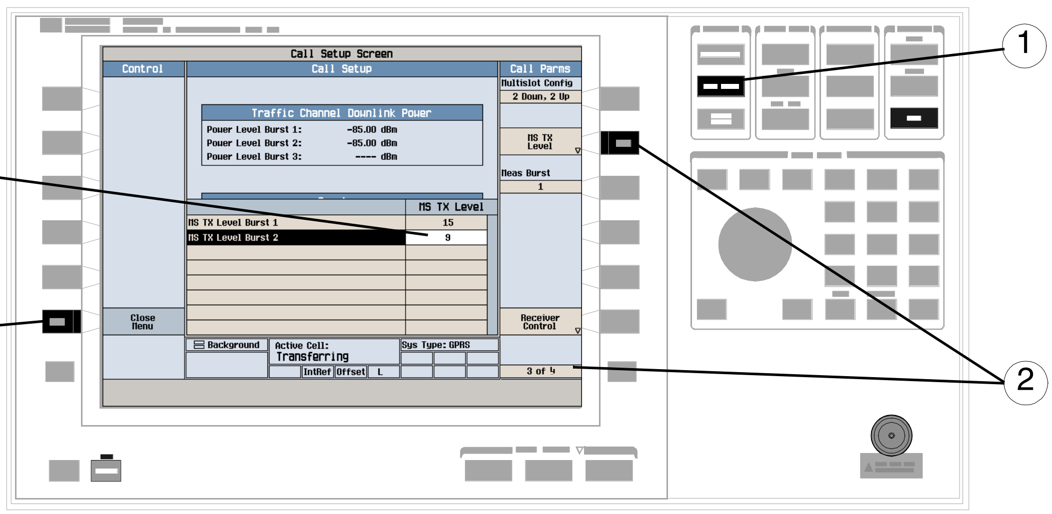
There are two ways to change the MS TX Level:

A. Change the level immediately

B. Change the level during a handover

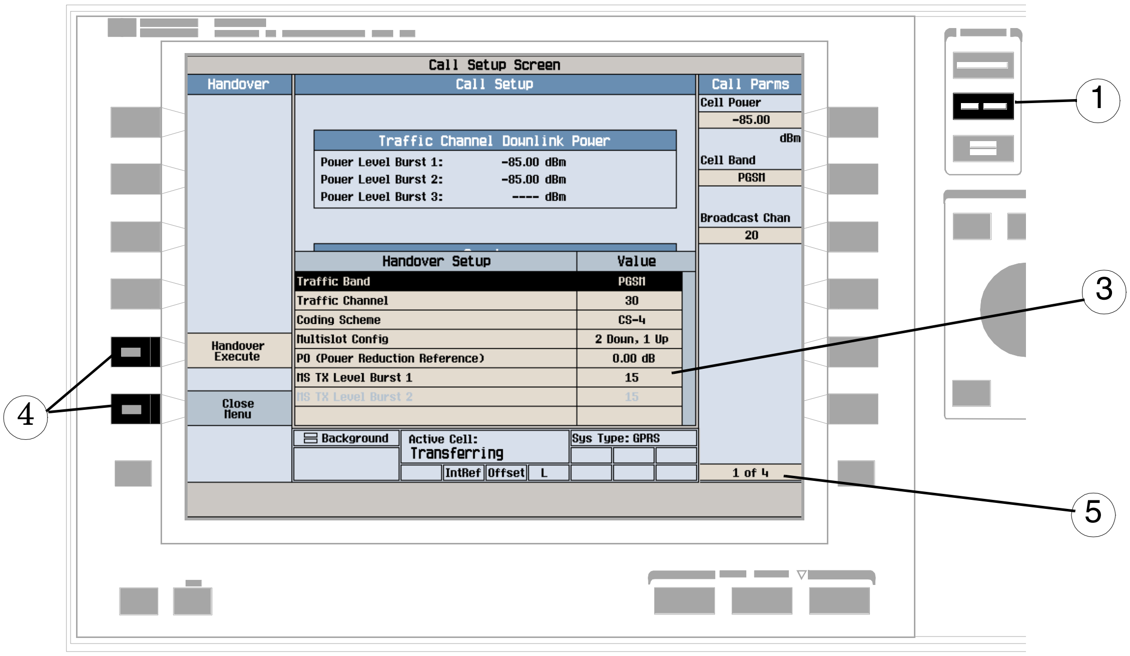
Both are explained below.

A. Change the MS TX level immediately.



1. Press the **CALL SETUP** key.
2. On the Call Parms menu (3 of 3) press the `MS TX Level` (**F8**) key.
3. Set a new MS TX level and press the knob.
4. Press the `Close Menu` (**F6**) key.

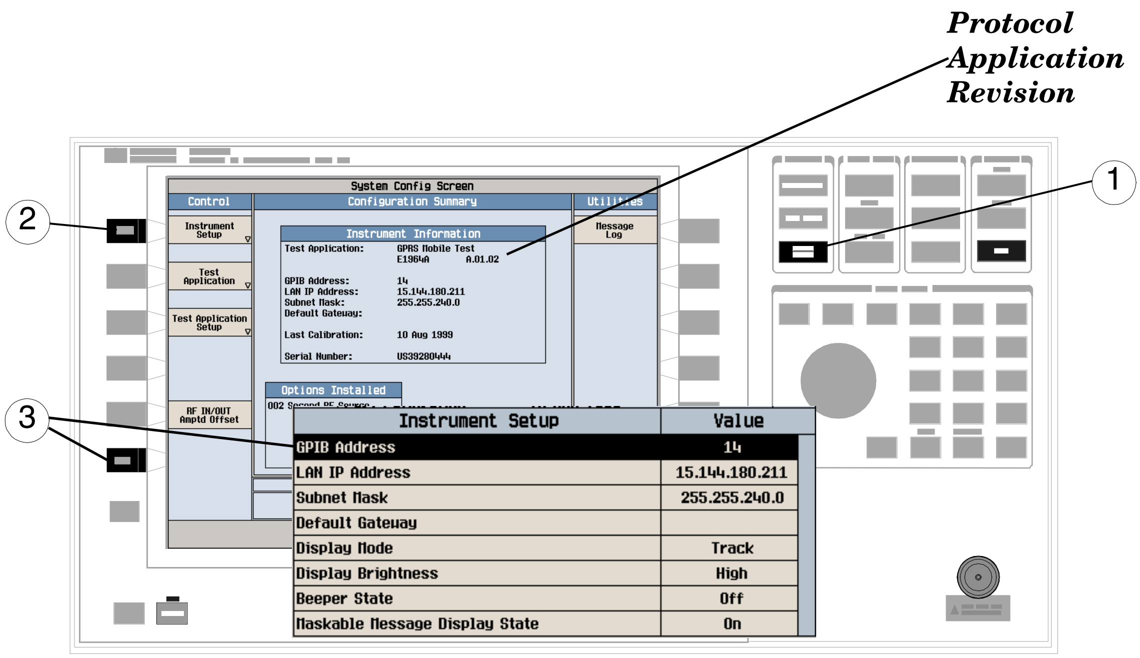
B. Change the MS TX level during a handover.



1. Press the **CALL SETUP** key.
2. On Control menu, press the `Handover Setup` (**F5**) key.
3. Select and change the `MS TX Level`.
4. Press the `Handover Execute` (**F5**) key to change the MS TX level, or press the `Close Menu` (**F6**) key to leave the level unchanged.
5. Use the **More** key to check that the MS TX level has been changed on the Call Parms menu (3 of 3).

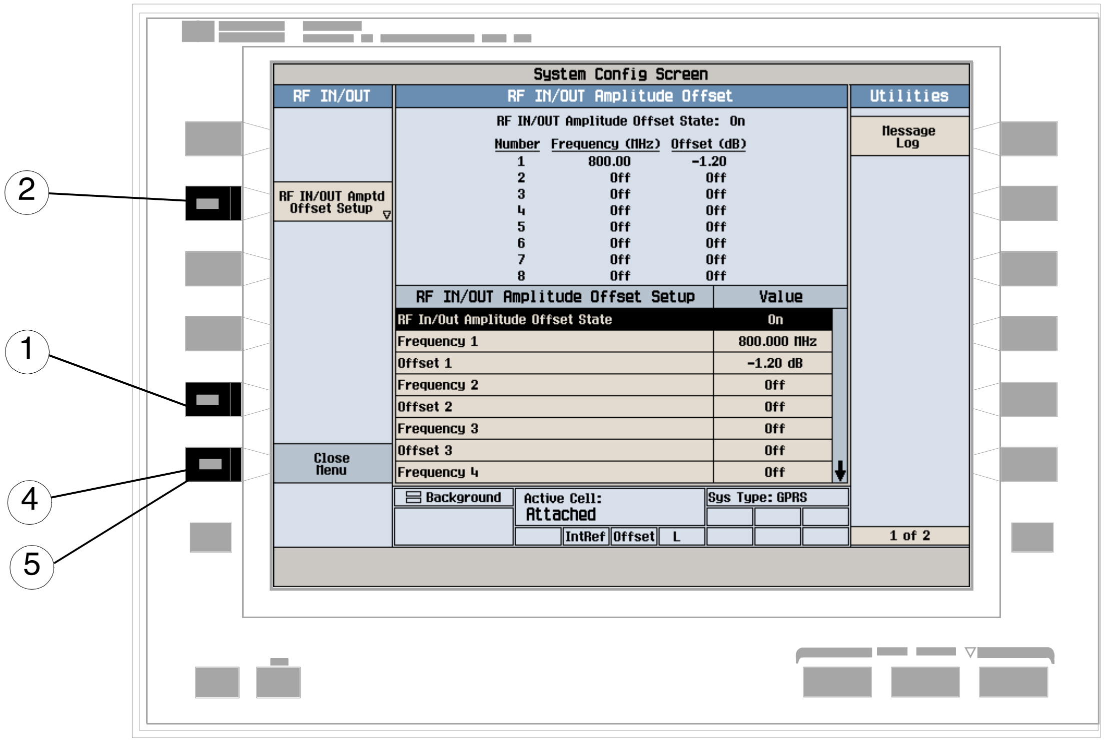
How Do I Configure the Test Set for My Test System?

A. Configure instrument information and setup.



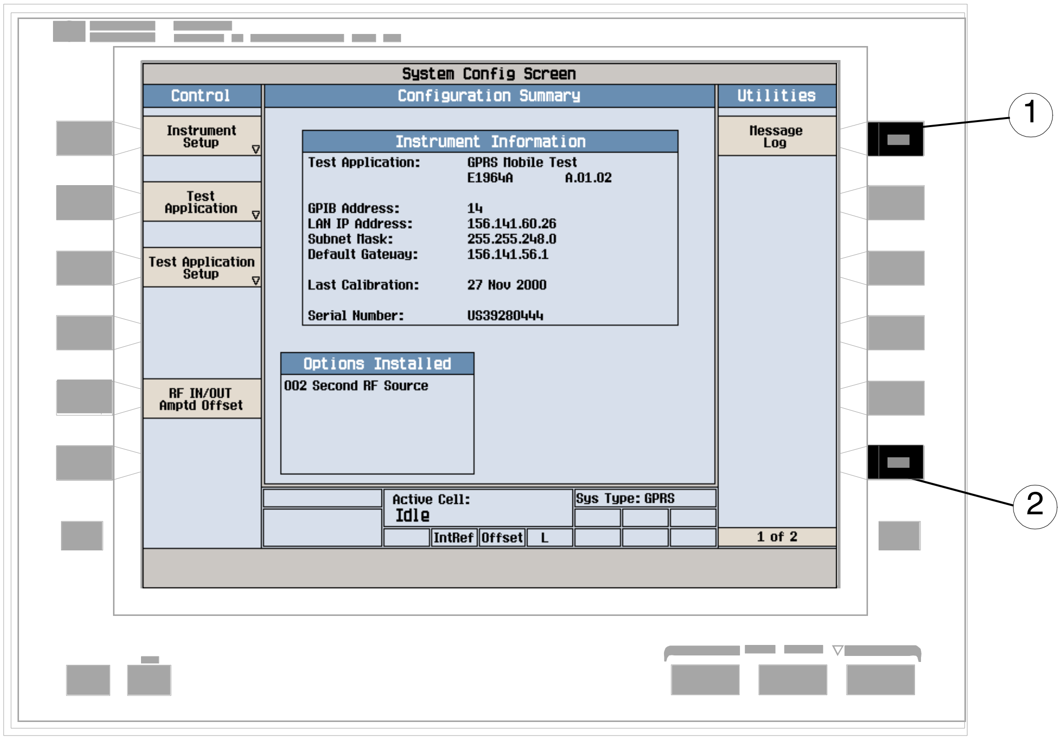
1. Press the **SYSTEM CONFIG** key.
2. Press the `Instrument Setup` (**F1**) key.
3. Adjust an instrument setting and then press the `Close Menu` (**F6**) key.

B. Set amplitude offsets.



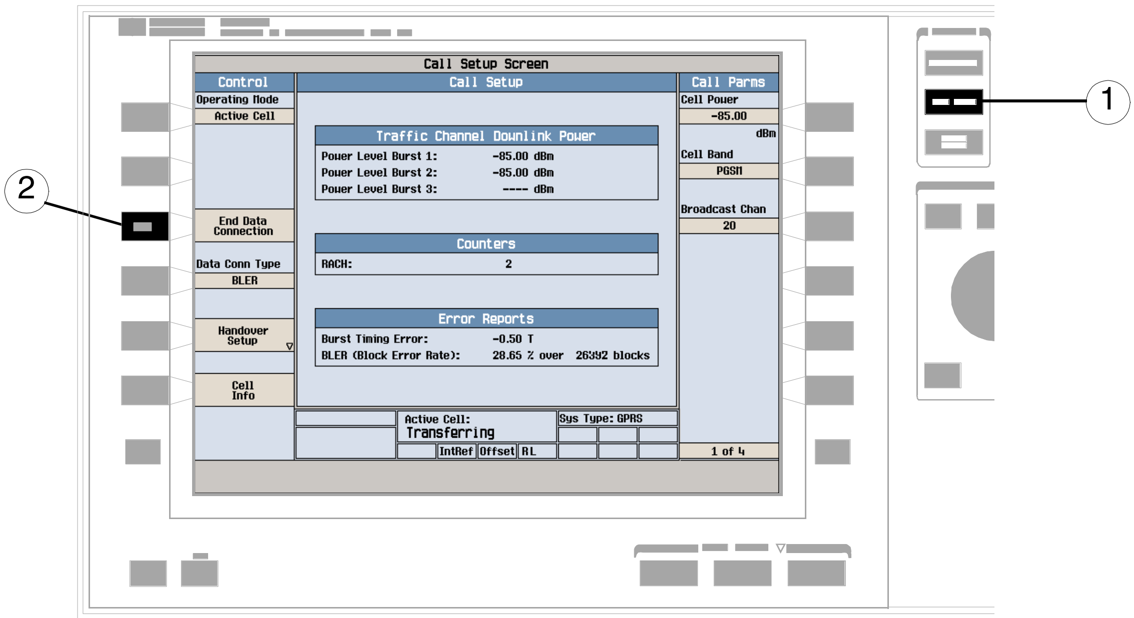
1. On the Configuration Summary screen, press the `RF IN/OUT Amptd Offset` (**F5**) key.
2. On the RF IN/OUT Amplitude Offset screen, press the `RF IN/OUT Amptd Offset Setup` (**F2**) key.
3. Enter the amplitude offsets for the test frequencies you use.
4. Press the `Close Menu` (**F6**) key.
5. Press the `Return` (**F6**) key to return to the Configuration Summary screen.

C. Check the message log.



1. Press the `Message Log` (**F7**) key and view the message log.
2. Press the `Return` (**F12**) key.

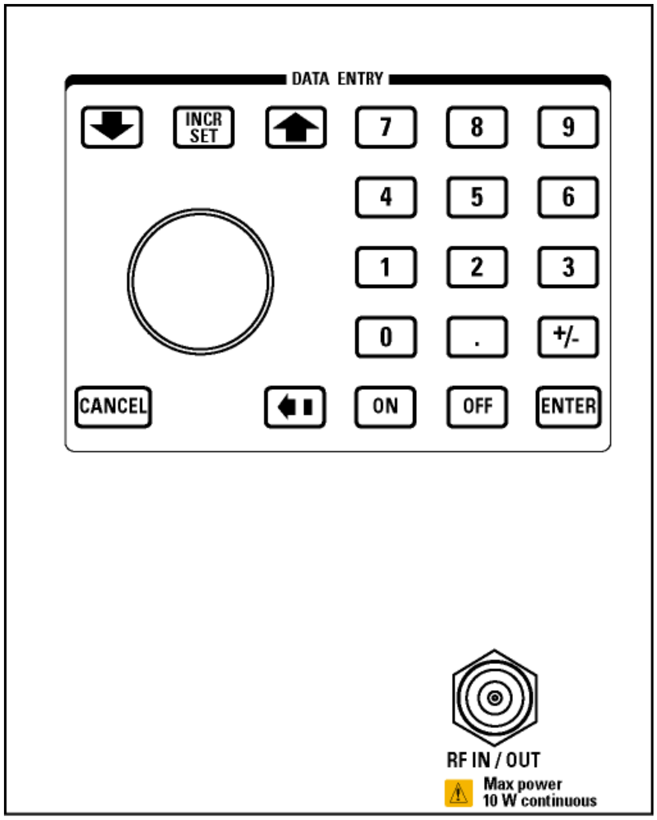
How Do I End the Data Connection?



1. Press the **CALL SETUP** key.
2. Press the `End Data Connection` (**F3**) key, or end the data connection from the mobile.
3. To ensure the data connection has ended check for `Attached` in the `Active Cell:` field.

Front Panel Connectors

Description



RF IN/OUT

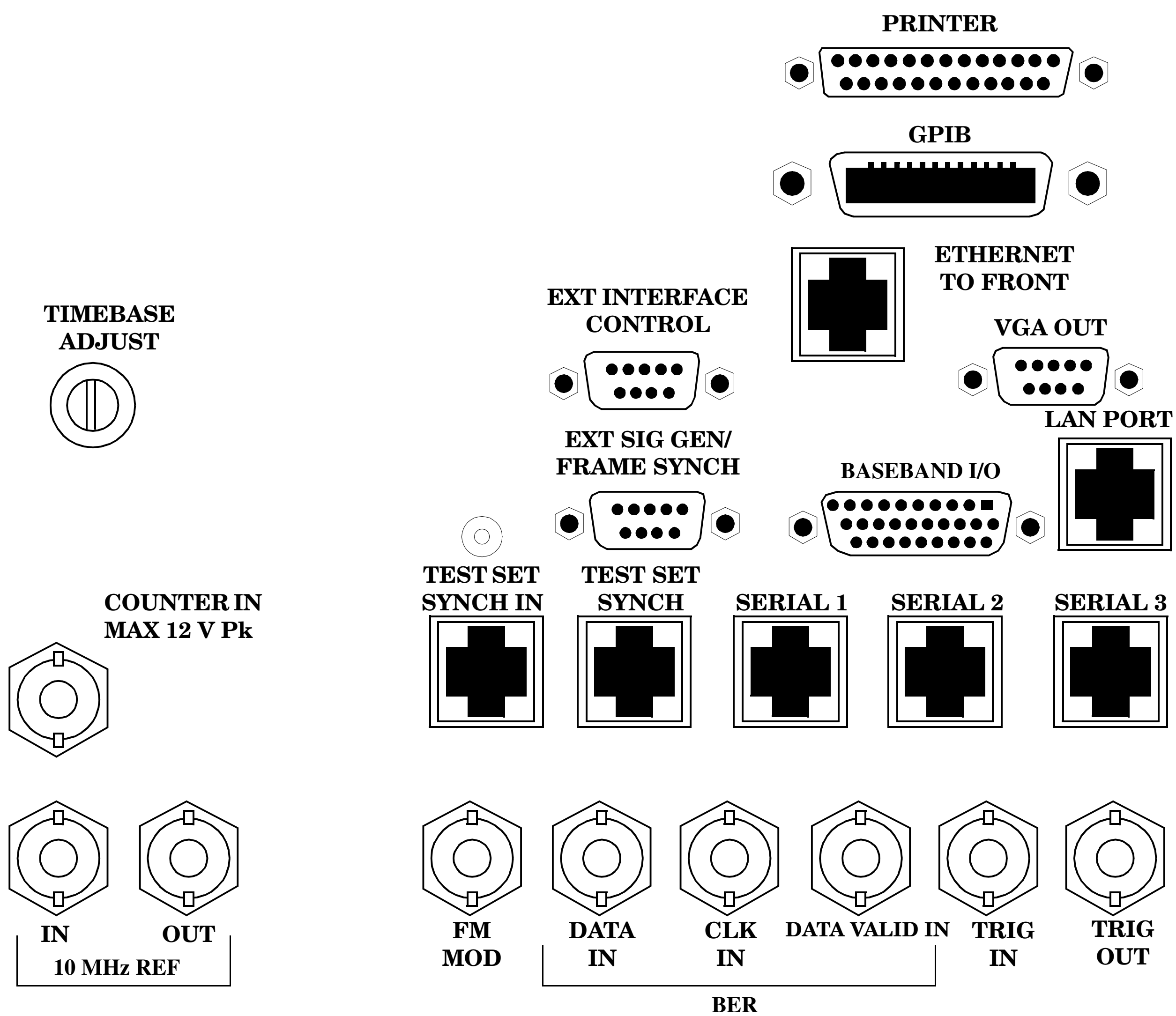
This Type-N connector is the path for all RF signals out of the test set, and is used as the RF input. Refer to the technical specifications for more information.

Related Topics

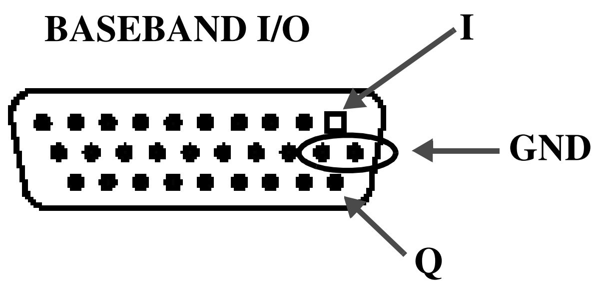
"Block Diagram" on page 413

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

Not functional for this release.

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 downloading firmware upgrades, or new protocol 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

This BNC connector provides the capability for you to trigger instruments from an external source. Setting the Trigger Source setting to External for instruments which support this feature causes the instrument to trigger when a positive-going TTL compatible pulse is applied to this connector.

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.

Related Topics

"Timebase Description/Configuration" on page 429

"SYSTem:ROSCillator" on page 370

"Configuring the Test Set's GPIB Address" on page 432

"Configuring the Test Set's LAN" on page 430

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.

Related Topics

"Configuring the Test Set's GPIB Address" on page 432

Printing and Saving Screen Images

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 the rear-panel LAN 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 "Testing 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.

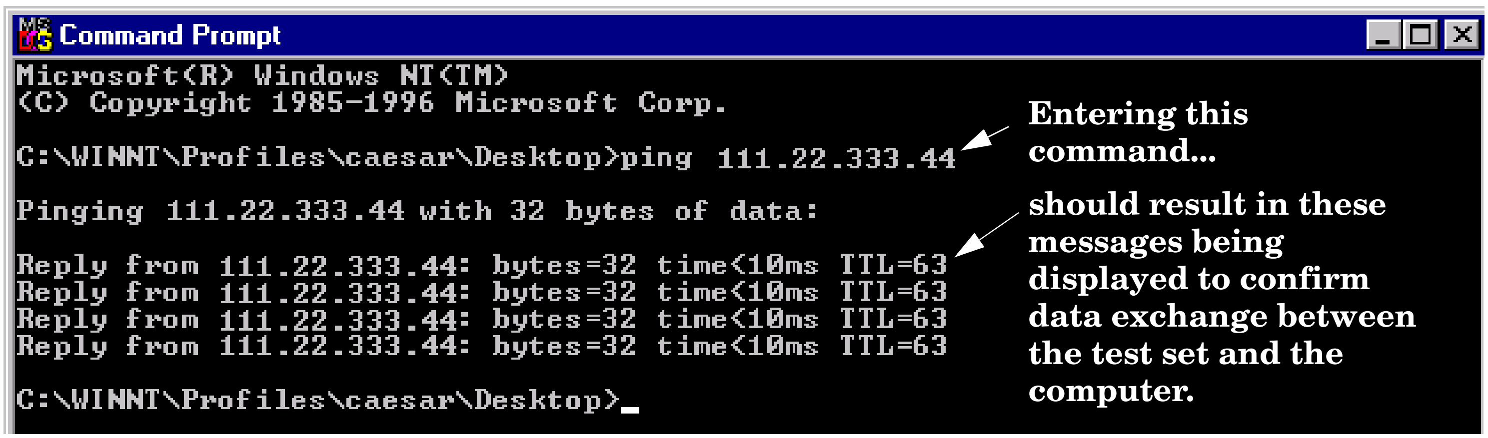
The image can now be retrieved from your directory and used as needed.

Testing 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.



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 LAN Cables

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.

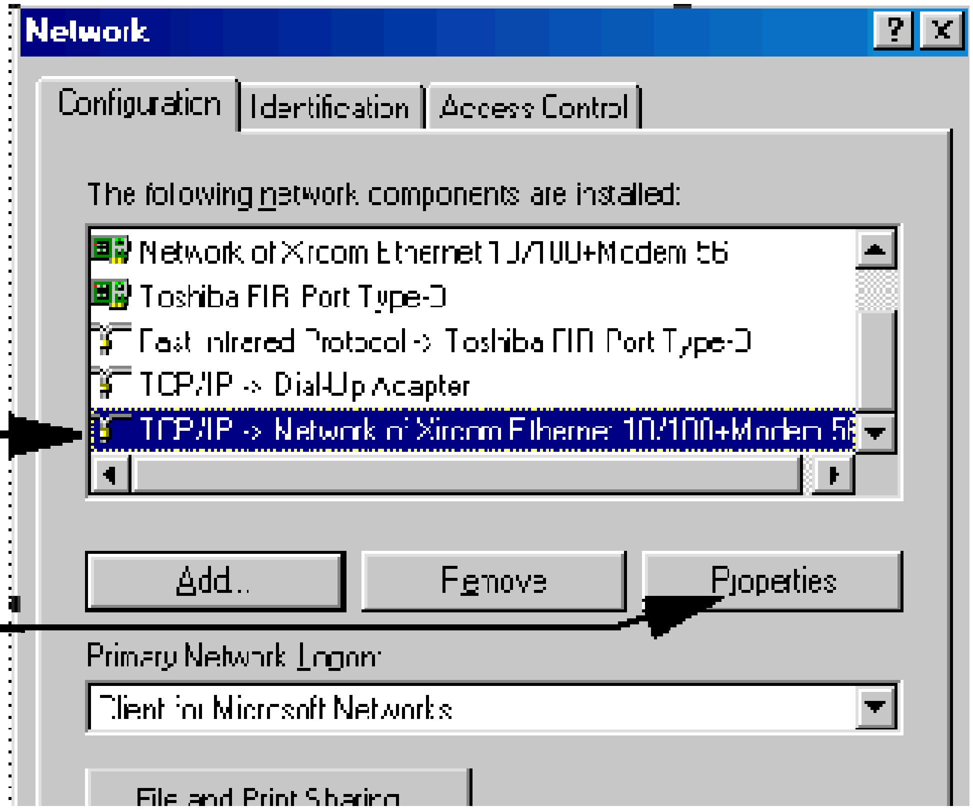
Access the Network Settings

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 1. Accessing Your Computer’s LAN Settings

Select the entry for your Ethernet network adapter, then...

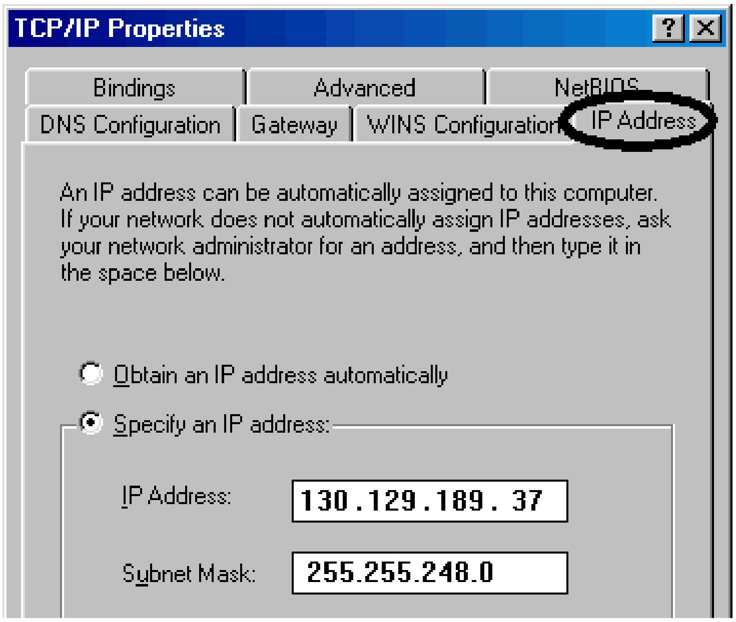
select Properties to list the TCP/IP settings for your adapter.



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).

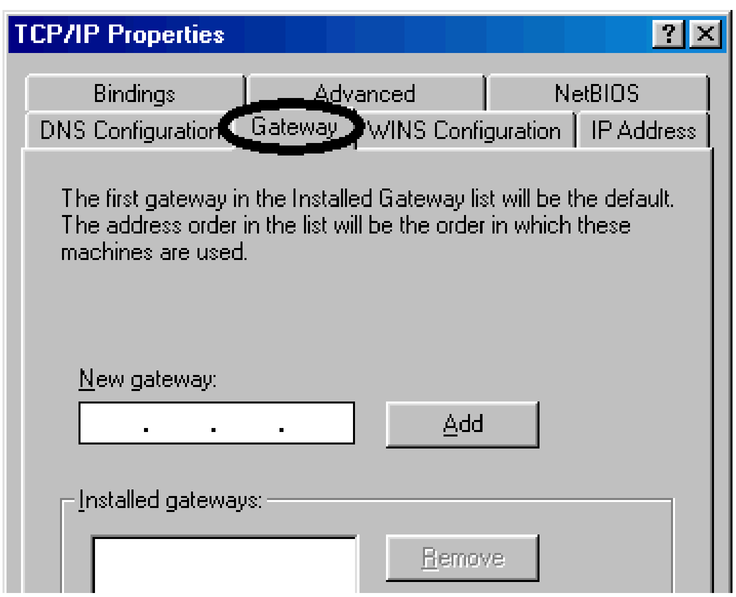
Figure 2. Specifying the Computer's IP Address and Subnet Mask



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 3. Accessing the Gateway Setting

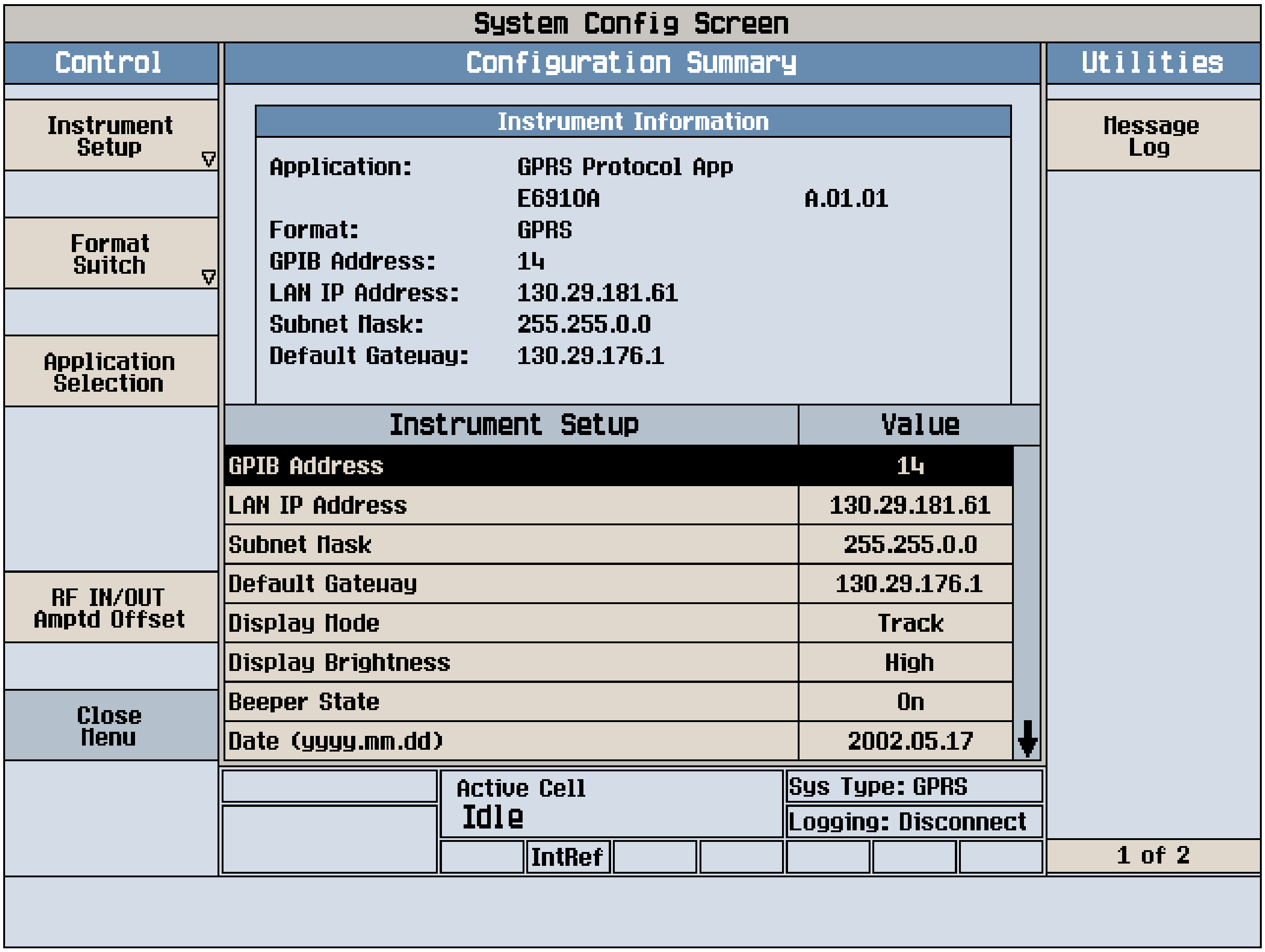


Restart Windows

Depending on your LAN network adapter, your computer may or may not apply the network configuration changes as they are made. It is import 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.



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.

---

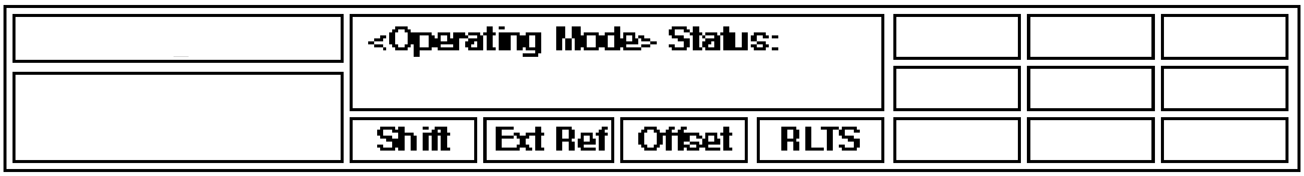
3. Turn the knob to highlight the setting you want to change.
4. Press the knob to select the setting.
5. Enter the new value using the keypad, and press the knob to complete the setting.
6. Turn the test set off and back on to start using the new settings.

Instrument Status Area

Description

The Instrument status area is found on the bottom center of the test set's display.

Figure 4. Status Area of the Test Set Display



<Operating Mode> Status

The call processing status and the operating modes are displayed in this area. This area may change (depending on the PA that is active) in order to provide PA 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.

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 some 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 3. Partial Preset Behavior

Function	Partial Preset Result
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
Maskable Message Display State	no change
Operating Mode	Active Cell
Transmit Power State	ON
Cell Activated State	ON

Preset Descriptions

Table 3. Partial Preset Behavior

Function	Partial Preset Result
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 will set all parameters to their default values. It is recommended to use a partial preset to save time.

Example

```
OUTPUT 714;"*RST" !Recommended command for a full preset.

OUTPUT 714;"SYSTEM:PRESET2" !Command for a full preset.
```

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 4. Full Preset Behavior

Function	Full Preset Result
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" on page 369

"*RST" on page 337

2 Call Processing

Protocol Event Trigger Output (PETO)

This feature provides a hardware trigger output from the rear panel of the test to control external instruments and devices. Various frame triggers and protocol message-based triggers are available, based on the downlink in multiple layers of the protocol stack.

The trigger has the following features:

- Triggers on every TDMA frame with user-settable timeslot and symbol positions
- Several more frame based triggers with varying degrees of frequency
- Protocol message based triggers output when specific DL messages are sent by the test set
- Triggers generated when the DUT is expected to Transmit or Receive

Multiple Triggers

Any combination of frame and protocol triggers can be enabled at the same time. Triggers fire in the order in which they occur, but all triggers are output on the same Trig Out port. It is not possible to discern which trigger has fired based only on the output signal.

If triggers occur at the same time, only one signal will appear on the port. Choose triggers carefully to provide the most meaningful results.

Related Topics

"Protocol Message Based Triggers" on page 78

"Frame Triggers" on page 77

"Protocol Trigger Timing" on page 80

"CALL:TRIGger" on page 284

Frame Triggers

All of the frame based triggers can be enabled and will fire in all operating modes except Cell Off. In Cell Off mode, triggers can be enabled, but will not fire.

All triggers are enabled and can fire on all data connection types, including ETSI A, ETSI B, BLER and IP Data.

The following frame triggers are available:

- Every frame except the idle frame
- Every GPRS radio block
- Every 51 Frame BCH multiframe
- Every 52 Frame PDTCH multiframe
- Every hyperframe (designated by frame number)

All frame triggers (except "every frame except idle") allows for a frame offset within the hyperframe/multiframe/radio block, on which the trigger should fire. Timeslot or symbol position cannot be set.

Related Topics

"Protocol Event Trigger Output (PETO)" on page 76

"Protocol Message Based Triggers" on page 78

"Protocol Trigger Timing" on page 80

"CALL:TRIGger" on page 284

Protocol Message Based Triggers

All protocol message based triggers can be used in any of the data connection types, including ETSI A, ETSI B, BLER and IP Data.

Messages that assign uplink resources also have an associated trigger that can fire on the first frame the DUT is expected to start transmitting as a result of the uplink assignment. The Expected DUT Tx trigger could be used to ensure that a DUT responds correctly to resource assignments and starts its transmission period in the correct place. The trigger output could be connected to a spectrum analyzer to initiate measurements on the frame the DUT starts to transmit.

Messages that assign downlink resources have a trigger associated with them that can fire on the first frame the DUT is expected to start receiving data as a result of the downlink resource assignment. The Expected DUT Rx trigger could be used to analyze data sent to a DUT by connecting the DUT to a logic analyzer. This could be useful to track DUT software defects or wireless application communication issues. This trigger gives an indication of when we expect the DUT to start receiving data.

Each protocol message to which triggers are related may have more than one trigger associated with it. At the very least each message has an associated trigger that can fire on the frame the message is transmitted from the test set to the DUT (downlink).

All protocol message based triggers can only be used in the Active Cell operating mode. Any message based trigger will not fire in any other mode other than active cell.

The protocol messages handled and the triggers associated with them are shown in the table below.

Table 5. Protocol Messages and their Associated Triggers

Protocol Message	Protocol Stack Layer	Test Set Tx Trigger	Expected DUT Tx Trigger	Expected DUT Rx Trigger
Packet Uplink Assignment	RLC/MAC	Yes	Yes	
Packet Downlink Assignment	RLC/MAC	Yes		Yes
Packet Timeslot Reconfigure	RLC/MAC	Yes	Yes	
Packet Power Control/Timing Advance	RLC/MAC	Yes		
Packet Immediate Assignment	RR	Yes	Yes	Yes
Identity Request	GMM	Yes		
Attach Accept	GMM	Yes		

Table 5. Protocol Messages and their Associated Triggers

Protocol Message	Protocol Stack Layer	Test Set Tx Trigger	Expected DUT Tx Trigger	Expected DUT Rx Trigger
Detach Request	GMM	Yes		
Request PDP Context Activation	SM	Yes		
PDP Context Activation Accept	SM	Yes		

Related Topics

"Protocol Event Trigger Output (PETO)" on page 76

"Frame Triggers" on page 77

"Protocol Trigger Timing" on page 80

Protocol Trigger Timing

Frame Trigger Timing

For any frame trigger that is enabled, a signal will be generated on the test set's trigger output on the first symbol period of the frame or frames on which the trigger is fired.

If a frame offset is set for any of the frame triggers, a signal will be generated that number of frames after the frame in which the trigger is fired.

Message Based Trigger Timing

All triggers associated with the sending of a message from the test set will generate a signal on the first symbol of the timeslot on which the first burst of the related message is sent.

All triggers associated with the DUT starting to receive data will generate a signal on the first symbol of the timeslot on which the test set begins transmission of the data.

All triggers associated with the DUT starting to transmit data will generate a signal on the first symbol of the timeslot on which the DUT should start to transmit.

If a frame offset is set for any of the message based triggers, a signal will instead be generated that number of frames after the frame in which the event occurs.

Related Topics

"Protocol Event Trigger Output (PETO)" on page 76

"Protocol Message Based Triggers" on page 78

"Frame Triggers" on page 77

Short Message Service (SMS)

Several Short Message Service (SMS) options are available, which allow you to test both point-to-point and cell broadcast SMS functionality. Short messages can be sent to and from the DUT.

GPRS Point-to-Point SMS

The service comprises two operations: Mobile Originated (MO) transmission, where the message is sent from an MS to the network; and Mobile Terminated (MT) transmission, where the message is sent from the network to an MS. The MS can either initiate(MO) SMS messages or receive(MT) SMS messages.

Both of these operations must be performed to complete the transfer of a message from one MS to another. The data sent by SMS can be either binary data, unicode (UCS2), or ASCII text up to 160 characters in length; the test set provides support only for ASCII messages. The point-to-point functionality allows both MO and MT transactions to be tested. The MS acknowledges receipt of point-to-point messages.

NOTE Received text messages will be displayed in ASCII, any ETSI Default Alphabet specific characters received will be replaced by their ASCII equivalents on the front panel display. In the cases where the ETSI characters map to control characters in the ASCII character set, a received character will be displayed as a blank space. The message text can be retrieved over the RUI in its original format without the conversion process detailed for the front panel.

Cell Broadcast SMS

The GPRS cell broadcast service allows short messages to be sent to every MS currently in a particular cell. Cell broadcast messages are repeated at intervals over a period of time, which allows an MS to receive the message even if entering the cell after the first transmission. The data sent can be either binary data or ASCII text up to 15 pages in length, where a page is up to 93 characters in length; the test set only provides support for ASCII messages. Cell Broadcast messages are classified by topic and allocated a channel number, message code, update number, and language.

- Channel Number is a header number identifying the message topic (such as 'Weather Report' or 'Traffic Information'), it is not in any way related to logical channels.
- Message Code identifies a particular message, so that an MS receiving a message with the same code as a previously received message will recognize that it is a repeat, and may not display it to the user.
- Update Number is used to identify a particular version of a message. This is useful for reporting a dynamic situation, where a message may be reporting one event (such as road works or road construction ahead), but the details change periodically (the length of the tail-back or traffic jam caused, for example). An MS which remains in one cell for a length of time will receive messages with the same message code, but incrementing update numbers as updated versions of the same message are received; but an MS that enters the cell will received only the most recent version of the message, followed by any subsequent versions.
- Language indicates in what language the message is. Changing this parameter does not translate the text of a message.

Cell broadcast messages are not acknowledged by the MS.

The cell broadcast and point-to-point functions in the test set are not mutually exclusive.

Related Topics

"SMS Features Provided" on page 83

"SMS Procedures" on page 85

"Short Message Service (SMS) Messages" on page 87

"CALL:SMService" on page 274

SMS Features Provided

This section describes the features provided for point to point and cell broadcast SMS.

GPRS Point-to-Point SMS Features

- Delivery of a text message to the Device Under Test (DUT): either of two predefined messages or a user-defined text message.
- Reception and display of ASCII messages transmitted by the DUT
- Enabling or disabling the loopback feature (where a text message received from the DUT is delivered back to the DUT)
- Logging of messages sent and received by the DUT

Cell Broadcast SMS Features

The cell broadcast service allows multiple text messages to be sent serially. They are not transmitted simultaneously. As each text message is retransmitted periodically, multiple messages can be queued ready for retransmission. The test set can transmit up to three messages continuously.

Exactly one user-defined message can be created at one time. This user-defined message can be used in any of the transmitted messages.

When multiple messages are to be transmitted, they will be sent in numerical order at a rate of one page every multiframe. The messages are repeatedly transmitted over time every 30 seconds for this test set. This allows time to react to an incoming message. The ETSI standard has no upper bound on the transmission frequency.

Basic elements of the Cell Broadcast Service are listed below.

- Enabling or disabling the Cell Broadcast Service (CBS)
- Transmission of up to three text cell broadcast messages at any one time with the following options (each message can be configured individually):
  — Send one of two predefined messages
  — Send a user defined text message
  — Select a channel number
  — Select a message code
  — Select an update number
  — Select a language
- Logging of messages received by the DUT

User defined text messages can only be entered via the Remote User Interface (GPIB program).

Related Topics

“Short Message Service (SMS)” on page 81

SMS Features Provided

"SMS Procedures" on page 85

SMS Procedures

This section describes general procedures for using SMS features.

SMS Operating Modes

SMS features are only available in the Active Cell operating mode.

Mobile Terminated point-to-point SMS messaging can only be used when the test set uses the IP Data data connection type. The cell broadcast SMS features do not require a data connection.

Mobile Terminated Point-to-Point Message Transfer

1. Connect and power up the DUT.
2. If DUT does not attach automatically, perform a manual attach using the DUT.
3. After the DUT has attached, go to the Call Setup screen by pressing the **Call Setup** key.
4. Go to the second page of the Call Control menu by pressing the **More** key on the lower left corner of the test set.
5. Select `Short Message Service` by pressing the softkey **F5**.
6. Select the `Point to Point SMS` messaging by pressing the softkey **F1**.
7. Choose the message to send using the `Message Text` softkey (**F2**).
8. Press the `Send Message` softkey (**F1**) to send the message. Observe the DUT for indications that the message has been received. The test set display also gives an indication.

Mobile Originated Point-to-Point Message Transfer

1. Connect and power up the DUT.
2. If DUT does not attach automatically, perform a manual attach using the DUT.
3. After the DUT has attached, go to the Call Setup screen by pressing the **Call Setup** key.
4. Go to the second page of the Call Control menu by pressing the **More** key on the lower left corner of the test set.
5. Select `Short Message Service` by pressing the softkey **F5**.
6. Select the `Point to Point SMS` messaging by pressing the softkey **F1**.
7. Change Loopback option as desired.
8. Using the DUT's interface, set the DUT to send GPRS SMS.
9. Use the DUT to send a point-to-point message to any address.
10. Observe the test set for indications that the message has been received. If the loopback option is enabled, observe the DUT for indications that the message has been received.

Cell Broadcast Message Transfer

1. Connect and power up the DUT.

2. The DUT does not have to attach.
3. Go to the Call Setup screen by pressing the **Call Setup** key.
4. Go to the second page of the Call Control menu by pressing the **More** key on the lower left corner of the test set.
5. Select `Cell Broadcast` by pressing the softkey **F2**.
6. Set parameters as desired. To choose the messages to be sent, select `Message Setup` for that message and set `Message State` to `On`. `Message 1` is `on` by default.
7. Select the message to be sent using the Message Text menu for each message.
8. Start the broadcast message using the `Start Cell Broadcast` softkey (**F1**).
9. Observe the display on the DUT to confirm that the message(s) were received.
   Note this could take up 30 seconds.
10. If required, stop the broadcast by pressing the `Stop Cell Broadcast` softkey (**F1**).

Cell Broadcast Updated Message Transfer

1. Connect and power up the DUT.
2. The DUT does not have to attach.
3. Go to the Call Setup screen by pressing the **Call Setup** key.
4. Go to the second page of the Call Control menu by pressing the **More** key on the lower left corner of the test set.
5. Select `Cell Broadcast` by pressing the softkey **F2**.
6. Set parameters as desired. To choose the messages to be sent, select `Message Setup` for that message and set Message State to `On`.
7. Select the message to be sent using the Message Text menu for each message.
8. Start the broadcast message using the `Start Cell Broadcast` softkey (**F1**).
9. Observe the display on the DUT to confirm that the message(s) were received.
10. Select Message Setup for each message to be sent as an update.
11. Set the Update Number for these messages higher than their previous value. The update number wraps from 15 to 0.
12. Observe the display on the DUT to confirm that the updated message(s) have replaced the first versions.
13. If required, stop the broadcast by pressing the **Stop Cell Broadcast** softkey (**F1**).

Related Topics

"Short Message Service (SMS)" on page 81

"SMS Features Provided" on page 83

"Short Message Service (SMS) Messages" on page 87

Short Message Service (SMS) Messages

Several Short Message Service (SMS) message options are available, which allow you to choose or create messages to be sent.

Predefined Point-to-Point Text Messages

There are two predefined point-to-point text messages. The ASCII text strings of these messages are as follows:

Predefined text message 1 -

01234567890ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

Predefined text message 2 -

Agilent Technologies, your partner in wireless solutions.

Predefined Cell Broadcast Text Messages

There are two predefined cell broadcast text messages. The ASCII text strings of these messages are as follows:

Predefined text message 1 -

The quick brown fox jumps over the lazy dog

Predefined text message 2 -

This instrument provides functional testing of broadcast SMS by sending up to three broadcast messages to the device under test. Two fixed messages and a user defined message are available for selection. The second fixed message spans multiple pages.

User Defined Text Message (Custom Text Message)

A custom text message can be defined only via the remote user interface. The maximum length for user defined messages is:

- Point-to-point: 160 characters
- Cell Broadcast: 93 characters

Point-to-point and cell broadcast messages each have their own custom message available. The GPIB commands are:

CALL:SMService:PTPoint[:MTERminated]:TEXT:CUSTom for point-to-point messages, and

CALL:SMService:CBRoadcast:TEXT:CUSTom for cell broadcast messages.

Related Topics

“SMS Features Provided” on page 83

“SMS Procedures” on page 85

“Short Message Service (SMS)” on page 81

Short Message Service (SMS) Messages

"CALL:SMService" on page 274

Packet Broadcast Control Channel (PBCCH)

Packet Broadcast Control Channel (PBCCH) is transmitted in non active Cell operating modes (GPRS BCH, GPRS BCH+PDTCH). When a PBCCH is present, the DUT will perform all requests for GPRS services via this channel.

PBCCH can only be enabled/disabled when operating mode is Cell Off.

When the PBCCH is activated, Packet System Information 3 as well as PSI1, PSI2 & PSI3bis are transmitted on the new channel. When the PBCCH is on, it is generated in Timeslot 1 on the same ARFCN as the BCCH.

PRACH type (8 or 11 bit) can also be configured using the PBCCH Setup softkey.

PBCCH Control

1. Press the **Call Setup** key to go to the Call Setup screen.
2. Press the `Operating Mode` softkey (**F1**) and select `Cell Off`.
3. Press the `Cell Info` softkey (**F6**).
4. Press the `PBCCH Setup` softkey (**F1**) to open the PBCCH Setup menu.
5. Set `PBCCH` to `On`.
6. Set `PRACH` to `8` or `11` bits as desired.
7. Press the `Return` softkey (**F6**) to go back to the Call Setup screen.
8. Press the `Operating Mode` softkey (**F1**) and select `Active Cell`.

To verify that the PBCCH is on, switch on the Device under test and verify that a PRACH is received during the attach procedure. The PRACH counter is on the Call Setup screen.

Related Topics

“CALL:PBCChannel” on page 222

Timing Advance and Continuous Timing Advance

Continuous timing advance is an alternative method; see GSM 04.04 section 7.10 and GSM 04.60 section 12.12. In the assignment/reassignment messages, in place of a timing advance value, the DUT is given a timeslot number, and an index value. With these two parameters, the DUT can look at the correct position in the Packet Timing-Advance Control Channel (PTCCH) for its timing advance value. In addition, the DUT periodically sends an access burst on the uplink PTCCH on the given timeslot.

If the continuous timing advance procedure is enabled, the DUT has to delay transmission of the uplink TBF until it has received its timing advance value.

Continuous timing advance is valid when using all available Data Connection Types ETSI A, ETSI B, BLER and IP Data.

The Continuous Timing Advance parameter allows the user to turn on and off the continuous timing advance functionality. Note that if continuous timing advance is "on", the timing advance value shall not be given in Packet Timeslot Reconfigure or Packet Power Control / Timing Advance messages.

The Timing Advance state continuous/fixed cannot be changed mid-TBF but the Timing Advance value can be changed.

If the Continuous Timing Advance procedure is on, the Timing Advance parameter (GPRS PA) should not be changed more often than once every two multiframes (approximately 0.5 seconds). This restriction arises due to the GSM/GPRS timing advance (PTCCH) multiframe structure.

Timing Advance and Continuous Timing Advance are set in the Call Setup screen's Control Menu, Protocol Control, RLC/MAC layer.

1. Press the **Call Setup** key.
2. Press the left **More** key to advance the Control menu.
3. Select `Protocol Control`.
4. Select `RLC/MAC`.
5. Select `Timing Advance Control`.
6. Set `Timing Advance` as desired.

NOTE The test set can adjust for up to four symbols of offset in the DUT transmission. If the DUT does not react to the timing advance change, the Burst Timing Error will change.

Table 6. Timing Advance Values

Timing Advance Values	Range	Default
All values are undefined, except for 111111, which indicates there is no timing advance defined.	0-63	0

Fixed Allocation

Fixed allocation is valid only while using Data Connection Type IP Data. Dynamic allocation is valid while using the following Data Connection Types: ETSI Type A, ETSI Type B, BLER, and IP Data.

While in Fixed mode, the USF BLER measurement will not display any results, as the DUT is not sending data blocks dependent upon the USF value. In this mode, the DUT will ignore the USF flag on the downlink, because it is given a block allocation by the network, or in this case, the test set.

Fixed Allocation mode cannot be used in the ETSI test modes connection types because the test specification mandates that Dynamic Allocation must be used. In BLER mode there is no uplink TBF, so the allocation type is unused. IP Data connections do use uplink TBFs and have no restrictions on the choice of allocation type.

As Fixed Allocation is only valid when using Data Connection Type IP Data. When an invalid connection type is selected, then the current TBFs will end and the test set will change the allocation mode setting to a valid selection (e.g. dynamic mode).

Fixed allocation provides more control over transferring data between the test set and the DUT. It provides the DUT with an allocation of uplink blocks which satisfies the number of octets that the DUT believes is necessary to transfer all of its data. It can be done using either a close-ended TBF or an open-ended TBF.

A close-ended TBF is one in which an exact number of octets is requested and provided by the DUT. An open-ended TBF is one in which the network provides an arbitrary number of octets and the DUT keeps making resource requests until it can satisfy its requirements. Both methods are supported by the test set.

If the DUT requests zero octets, open-ended TBF is used. If the number requested is greater than zero, a close-ended TBF is used.

Number of reallocations can be controlled by setting the maximum number of octets per allocation. Octets can be set to Off, or numbers from 1-9999, with a step size of 10.

There are two access modes for allocation. Dynamic indicates that the DUT should monitor the downlink for a USF value that matches its assigned USF. When it finds a match, the DUT can then transfer the data blocks on the following uplink blocks.

Dynamic allocation is available in all data connection types. Fixed allocation is only available in IP Data.

If the data type is changed to an invalid type during data transfer, the current TBFs will end and the test set will change its allocation mode to a valid setting.

Fixed Allocation Control

1. Press the **Call Setup** key.
2. Press the left **More** key to advance the Control menu.
3. Select `Protocol Control`.
4. Select `RLC/MAC`.
5. Select `Allocation Control`.
6. Set allocation parameters as desired.

Related Topics

"CALL:PDTCH|PDTChannel" on page 224

Uplink State Flag (USF) BLER

Uplink State Flag (USF) BLER is a measurement report. It is viewed in the Call Setup screen.

The USF BLER report is an indication of the number of PDTCH blocks incorrectly decoded (USF bits only) by the MS. This report is calculated by counting the number of blocks that the MS fails to transmit as a consequence of incorrectly decoding the USF of the block preceding the expected transmission period. This serves as an indication of the MS's receiver performance.

RLC/MAC uplink allocation mode must be Dynamic.

Table 7. USF BLER Validity

Data Connection Type	USF BLER Valid
ETSI A	Yes
ETSI B	Yes
BLER	No, uplink TBF is not present
IP Data	Yes, if uplink TBF is present (allocation must be dynamic)

Related Topics

"Uplink State Flag (USF)" on page 47

"CALL:STATus:PDTCH | PDTChannel:USFBler?" on page 282.

"CALL:PDTCH|PDTChannel" on page 224

Measurement Reports

Measurement Reports display measurements from the DUT regarding the quality of the downlink channel. The following channel parameters are available:

1. Press the **Call Setup** key.
2. Press the left **More** key to advance the Control menu.
3. Select Measurement Reports. The Measurement Reports screen shall display.

Block Error Rate (BLER) Reports Description

Block Error Rate (BLER) reports can be used in the production process to test the performance of a GPRS mobile station's receiver. The BLER result is derived from the Radio Link Control (RLC) layer's Packet ACK/NACK (Acknowledged/Not Acknowledged) message. BLER is simply the ratio of the number of negatively acknowledged blocks to the total number of blocks acknowledged by the mobile station.

The test set uses an Agilent proprietary data connection to enable BLER reports to be retrieved from the mobile station (For details on how to set the data connection type to BLER, see "CALL:FUNCtion:DATA:TYPE" on page 211).

The BLER reports which the test set provides are based on GPRS receiver tests defined in 3GPP 51.010 (formerly ETSI GSM 11.10), section 14.16.

When are BLER Reports Made?

You obtain BLER results using the GPIB query "CALL:STATus:PDTCH | PDTChannel:BLERror?" on page 281. This query returns the percentage of blocks tested that were in error and the total number of blocks used to generate the BLER result. To reset the BLER result you must use "SYSTem:MEASurement:RESet" on page 368. The BLER result does not reset automatically when you connect a different GPRS mobile station.

The BLER results are only available when the data connection status is transferring (TRAN). If you require details on data connection states, see "Data Connection Processing State Synchronization" on page 155.

Using Different Power Levels on Downlink Timeslots

The BLER results are calculated across all active downlink timeslots, not on any individual downlink timeslot.

NOTE When using the multislot configurations which provide two downlinks (D2U1 and D2U2), the test set requests Packet ACK/NACK (Acknowledged/Not Acknowledged) messages from the mobile station on timeslot 4. ETSI specifies that the mobile station must respond to these requests on the same timeslot. If the downlink on timeslot 4 degrades severely (and thus has a large number of block errors), the mobile station may be unaware of a request for Packet ACK/NACK messages. If this happens, the BLER reports may hang for long periods or stop completely. This may cause the data connection to stop after a few seconds.

Programming BLER Reports

This section provides an example of how to use BLER reports to test your mobile station's receiver via GPIB.

The following procedure assumes that a data connection has been established between the test set and the mobile station (connection status is Transferring). See "Programming Example 3: Make a connection" on page 119.

1. Configure the BCH and PDTCH parameters using the CALL subsystem.
2. Reset the BLER results using the SYSTem:MEASurement:RESet command.
3. Use the CALL:STATus:PDTCH:BLERror? query to obtain the first BLER results.

4. Re-configure the downlink PDTCH power level of one of the bursts using the CALL subsystem.
5. Reset the BLER results again using the SYSTem:MEASurement:RESet command.
6. Use the CALL:STATus:PDTCH:BLERror? query to obtain the second BLER results.

Programming Example

```
10    ! This code assumes that the current data connection state is Transferring.
20    !
30    ! Configure BCH and PDTCH parameters
40    OUTPUT 714;"CALL:PDTCH:BAND PGSM" ! Set the PDTCH band.
50    OUTPUT 714;"CALL:POW -60" ! Set the BCH level to -60 dBm
60    OUTPUT 714;"CALL:PDTCH:MSL:CONF D2U1" ! Set the multislot configuration to
70                                         ! two downlinks, one uplink.
80    OUTPUT 714;"CALL:PDTCH:PZER:LEV 30" ! Set the P0 reference level to 30 dB.
90    OUTPUT 714;"CALL:PDTCH:CSCH CS4" ! Set the channel coding scheme to CS4.
100   !
110   ! Perform a measurement reset to ensure a stable data connection.
120   OUTPUT 714;"SYST:MEAS:RES"
130   ! Read initial BLER ensuring that result is over 2000 blocks at least
140   REPEAT
150     OUTPUT 714;"CALL:STAT:PDTCH:BLER?"
160     ENTER 714;Bler_initial,Blocks_initial
170   UNTIL (Blocks_initial>=2000 AND Blocks_initial<=2300) ! <= required for
180                                                         ! NAN (9.91E+37) case.
190   !
200   ! Print results at initial downlink PDTCH power level
210   ! of -90 dBm(-60 dBm BCH level - 30 dB P0 level)
220   PRINT "Blocks tested at -90 dBm = ";Blocks_initial
230   PRINT "BLER Result at downlink PDTCH power of -90 dBm = ";Bler_initial
240   !
250   ! Set up and select the downlink PDTCH power reduction levels.
260   OUTPUT 714;"CALL:PDTCH:PRED:LEV1 11db"
270   OUTPUT 714;"CALL:PDTCH:PRED:LEV2 0dB"
280   OUTPUT 714;"CALL:PDTCH:PRED:BURS1 PRL1"
290   OUTPUT 714;"CALL:PDTCH:PRED:BURS2 PRL2"
300   OUTPUT 714;"SYST:MEAS:RES" ! Reset the BLER results
310   !
320   ! Now obtain the second set of BLER results when burst 1 has a lower
330   ! power level which introduces more block errors.
340   REPEAT
350     OUTPUT 714;"CALL:STAT:PDTCH:BLER?"
360     ENTER 714;Bler_second,Blocks_second
370   UNTIL (Blocks_second>=2000 AND Blocks_second<=2300)
380   !
390   ! Print results when downlink burst 1 is at lower downlink PDTCH
400   ! power level of -101 dBm(-60 dBm BCH level - 30 dB P0 level - 11 dB power
410   ! reduction level).
420   PRINT
430   PRINT "Blocks tested at -101 dBm = ";Blocks_second
440   PRINT "BLER Result at downlink PDTCH power of -101 dBm = ";Bler_second
450   END
```

Returned Values

The BLER reports returned by this program are:

- `Blocks_initial` returns the number of blocks tested to calculate the first BLER result.
- `Bler_initial` returns the BLER result, in percent (%) when the downlink PDTCH power levels of both bursts are at -90 dBm.
- `Blocks_second` returns the number of blocks tested to calculate the second BLER result.
- `Bler_second` returns the second BLER result, in percent (%). This result has been obtained when the downlink PDTCH power level of the first burst has been reduced by 11 dB to -101 dBm.

Related Topics

"Testing a GPRS Mobile Station" on page 125

"CALL:STATus:PDTCH | PDTChannel:BLERror?" on page 281

"Programming Examples" on page 185

"GPRS Data Connection Troubleshooting" on page 416

Protocol Stack Configuration

Many elements of the protocol stack can be configured. Protocol control can be accessed via the Call Setup screen.

1. Press the **Call Setup** key.
2. Press the **More** key on the lower left corner to display the second page of the Control menu.
3. Press the `Protocol Control` softkey (**F4**) to display a list of protocol layers. Each layer has certain controllable settings.

How the Test Set Performs a Dualband Handover

The dualband handover function has been implemented as a packet timeslot reconfigure for GPRS, rather than an interband handover, since the test set currently has one BCH (cell).

The test set has the ability to switch traffic channels from:

- EGSM/PGSM/RGSM to DCS/PCS/GSM450/GSM480/GSM750/GSM850
- GSM450 to EGSM/PGSM/RGSM/DCS/PCS/GSM480/GSM750/GSM850
- GSM480 to EGSM/PGSM/RGSM/DCS/PCS/GSM450/GSM750/GSM850
- GSM750 to EGSM/PGSM/RGSM/DCS/PCS/GSM450/GSM480/GSM850
- GSM850 to EGSM/PGSM/RGSM/DCS/PCS/GSM450/GSM480/GSM750
- DCS/PCS to EGSM/PGSM/RGSM/GSM450/GSM480/GSM750/GSM850

No other combinations of traffic channel band handovers are supported. Also, the traffic channel band can only be changed when an active link exists between the test set and a mobile station. See “Programming Example 3: Make a connection” on page 119.

There are parameters that can be set up to take on different values depending on the broadcast band currently selected. These are called “Frequency Banded Parameters” on page 109. After a handover, the frequency banded parameters for the new band are active. Only one set of frequency banded parameters is active at any one time. However, you can set up any of the parameters for bands involved in the handover because the test set remembers the settings and switches to them when the handover occurs.

Related Topics

“Programming Example 4: Reconfigure Test Set and Mobile Station Connection Parameters” on page 121

Configuring Mobile Station Operating Parameters

The mobile station operating parameters are configured using the following call processing subsystem commands. For a complete list of GPIB commands in the call processing subsystem, refer to "CALL Subsystem" on page 162.

GPRS Mobile Station Operating Parameters

Parameter	GPIB Command
Uplink Burst TX Level for selected PDTCH band	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230
Uplink Burst TX Level for DCS band	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230
Uplink Burst TX Level for EGSM band	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230
Uplink Burst TX Level for PCS band	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230
Uplink Burst TX Level for selected PGSM band	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230
Deferred Uplink Burst TX Level for selected band	"CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 262
Guard Band Period Length	"CALL:MS:TX:BURSt:GPLength" on page 217

Operating Considerations

There are a number of parameters for the broadcast channel (see "Configuring the Broadcast Channel (BCH)" on page 104) that can be configured, however the test set's default parameters should allow a properly functioning mobile station to successfully camp on the cell and make a call under most circumstances.

When Operating Mode = Active Cell, if a call is connected, changes to these parameters, including a change to the value of the parameter's current setting, causes signaling on the downlink to automatically initiate the change. No separate command is necessary to initiate the change. If a call is not connected, changes to the parameter are stored for when the next call is established.

For details on the parameters you can use to configure the PDTCH, see "Configuring the Packet Data Traffic Channel (PDTCH)" on page 106.

Active Cell Operating Mode

The operating mode changes the way in which the test set interacts with the mobile station.

For GPRS, the test set can operate in four different operating modes, active cell mode, test mode BCH, test mode BCH+PDTCH, or cell off (see “GPRS Test Mode Operation” on page 102).

Active cell operating mode provides active signaling between the mobile station and the test set’s base station emulator. It is used when emulating a normal GPRS cell.

In active cell operating mode the base station emulator, using the test set’s GMSK modulated source, generates a downlink (base station to mobile station direction) broadcast channel (BCH) which represents a cell. The GPRS mobile station can “camp” to this signal, just as it would camp to a cell on a real network, and perform an attach procedure to register the mobile station with the network. A Packet Data Traffic Channel (PDTCH) can then be established using the ETSI defined GPRS Test Mode and data can be transferred in both the downlink and uplink directions.

For a typical scenario detailing the steps you might take to test a GPRS mobile station, see “Testing a GPRS Mobile Station” on page 125.

Related Topics

“Configuring the Broadcast Channel (BCH)” on page 104

“Configuring the Packet Data Traffic Channel (PDTCH)” on page 106

“Testing a GPRS Mobile Station” on page 125

“Programming Examples” on page 185

Test Mode Operating Modes

The operating mode changes the way in which the test set interacts with the mobile station.

For GPRS, the test set can operate in four different operating modes, active cell mode, test mode BCH, test mode BCH+PDTCH, or cell off.

You use Test mode (see “CALL:OPERating” on page 221 for GPIB syntax) when it is not possible, or not desired, to communicate via over-the-air signalling with the mobile station, but downlink stimulus and uplink measurements are still needed.

If you require details on active cell operating mode for GPRS, see “Active Cell Operating Mode” on page 101.

GPRS Test Mode Operation

GPRS Test Mode BCH Behavior

When Cell Operating Mode is set to “GPRS Test Mode BCH” (PBTest), the base station emulator produces the BCH but does not attempt to demodulate the uplink. Non-functional features (for example, “Start Data Connection”) of the BS Emulator do not result in an execution error.

GPRS Test Mode BCH + PDTCH Behavior

When Cell Operating Mode is set to “GPRS Test Mode BCH + PDTCH” (PBPTest), the base station emulator produces the BCH and PDTCH. To specify the positions of the PDTCH use “CALL:PDTCH[:ARFCn][:SELected]” on page 227 and “CALL:PDTCH:MSLot:CONFiguration” on page 232. The locations of the specified uplink are demodulated but no signaling for control of a data connection is performed and PRACH bursts are not demodulated.

In this mode the following features are available:

- Generation of BCH + PDTCH on the downlink.
- If you manually synchronize the mobile station with the BCH, and then turn on the mobile station’s own PDTCH, and both uplink and downlink use the same ARFCN and timeslot(s), what is sometimes known as a “forced” call is in progress. Demodulation and channel decoding of the uplink are available, although no messages are decoded.

  Manually synchronizing the mobile station to the BCH is usually initiated from the mobile station keypad, or over a special mobile station test bus. This is not under the direct control of the base station emulator and is your responsibility.
- Changes to the Multislot Configuration or PDTCH ARFCN [PDTCH Band] reconfigure the downlink (although no channel assignment signalling takes place). The BS Emulator’s receiver is configured to receive at the modified frequency, timeslot and timing advance in the same way as when Cell Operating Mode is set to “Active Cell” (CELL).

OFF Behavior

If you set Cell Operating Mode “OFF” it causes the following actions:

- If Cell Operating Mode was currently using CALL:OPERating OFF, the setting is ignored and the operation is assumed to have successfully completed immediately.

- If a mobile station is attached or a data connection is in progress, no attempt is made to use over-the-air signaling to disconnect or detach.
- All signaling operations, uplink demodulation and downlink (BCH, and PDTCH) generation are stopped.
- There is no RF power output.

Expected Burst

This parameter is only used when the test set's operating mode is set to "GPRS Test Mode BCH" (PBTest) or "GPRS Test Mode BCH + PDTCH" (PBPTest). When operating mode is set to Active Cell, the test set automatically selects the correct burst type.

A PDTCH can have one of eight midamble patterns. These patterns are called Training Sequence Codes (TSC). The Expected Burst parameter allows you to set the test set to expect a certain midamble pattern (TSC0 through TSC7) from the mobile.

For details on the GPIB command, see "CALL:BURSt" on page 194. (If you are using the test set manually, the Expected Burst field is in the Call Parms window.)

```
OUTPUT 714;"CALL:BURST:TYPE TSC5" !Sets the test set to expect a TCH with midamble
                                  !pattern TSC5.
```

RLC/MAC Header State

This parameter is only used when the test set's operating mode is set to "GPRS Test Mode BCH + PDTCH" (PBPTest).

The RLC/MAC header state parameter allows you to select whether or not a valid Radio Link Control (RLC)/Medium Access Control (MAC) header is present on the downlink PDTCH burst(s):

- If the RLC/MAC header state is set to OFF, all 53 octets (for CS4 encoding, for other coding schemes the number of octets will be less) in the burst are filled with PRBS data.
- If the RLC/MAC header state is set to ON, the first 3 octets in the burst contain a valid RLC/MAC header indicating the burst sequence number and the power reduction value. The remaining 50 octets (for CS4 encoding, for other coding schemes the number of octets will be less) in the burst are filled with PRBS data.

If the RLC/MAC header state is changed when the operating mode is any mode other than GPRS Test Mode BCH+PDTCH, the setting is remembered until GPRS Test Mode BCH+PDTCH is next used.

For details on the GPIB command, see "CALL:PBPTest:RLCMac[:HEADer]:STATe" on page 223. (If you are using the test set manually, the RLC/MAC Header field is in the Call Parms window.)

```
OUTPUT 714;"CALL:PBPTest:RLCMac:HEADer:STATe ON" !Enables the RLC/MAC header.
```

Related Topics

"Configuring the Broadcast Channel (BCH)" on page 104

"CALL:OPERating" on page 221

"Configuring the Packet Data Traffic Channel (PDTCH)" on page 106

Configuring the Broadcast Channel (BCH)

The broadcast channel parameters are configured using the following call processing subsystem commands. For a complete list of GPIB commands in the call processing subsystem, refer to "CALL Subsystem" on page 162.

Broadcast Channel Parameters

Parameter	GPIB Command
Cell Band	"CALL[:CELL]:BAND[:SELected]" on page 177
Cell Power	"CALL[:CELL]:POWer[:SAMPlitude][:SELected]" on page 246
Broadcast Channel (ARFCN) - Selected band	"CALL[:CELL]:BCHannel[:ARFCn][:SELected][:SELected]" on page 181
Broadcast Channel (ARFCN) - DCS band	"CALL[:CELL]:BCHannel[:ARFCn]:DCS[:SELected]" on page 183
Broadcast Channel (ARFCN) - EGSM band	"CALL[:CELL]:BCHannel[:ARFCn]:EGSM[:SELected]" on page 184
Broadcast Channel (ARFCN) - PCS band	"CALL[:CELL]:BCHannel[:ARFCn]:PCS[:SELected]" on page 190
Broadcast Channel (ARFCN) - GSM450 band	"CALL[:CELL]:BCHannel[:ARFCn]:GSM450[:SELected]" on page 186
Broadcast Channel (ARFCN) - GSM480 band	"CALL[:CELL]:BCHannel[:ARFCn]:GSM480[:SELected]" on page 186
Broadcast Channel (ARFCN) - GSM750 band	"CALL[:CELL]:BCHannel[:ARFCn]:GSM750[:SELected]" on page 188
Broadcast Channel (ARFCN) - GSM850 band	"CALL[:CELL]:BCHannel[:ARFCn]:GSM850[:SELected]" on page 190
Broadcast Channel (ARFCN) - PGSM band	"CALL[:CELL]:BCHannel[:ARFCn]:PGSM[:SELected]" on page 192
Broadcast Channel (ARFCN) - RGSM band	"CALL[:CELL]:BCHannel[:ARFCn]:RGSM[:SELected]" on page 193
BA Table	"CALL[:CELL]:BA:TABLe[:SELected][:SELected]" on page 166
Set PCS 3 digit MNC state	"CALL[:CELL]:PMNCode:STATe[:SELected]" on page 243

Operating Considerations

There are a number of parameters for the broadcast channel that can be configured, however the test set's default parameters should allow a properly functioning mobile station to successfully camp on the cell and make a call under most circumstances.

Parameters can be queried from the test set regardless of the state of the test set.

If the test set is in active cell operating mode, parameters MCC, MNC, LAC, NCC, and BCC can not be set unless the Cell Activated State is OFF.

If the test set is in test mode (see “Test Mode Operating Modes” on page 102) operating mode, any BCH parameter can be set at any time.

The 3 Digit MNC for PCS parameter defines if the PCS BCCH should be configured using the standard 2-digit MNC (J-STD-007 coding), or the PCS 3-digit MNC (J-STD-007A coding, section 2.10.5.1.3). The PCS 3-digit MNC is used on the PCS BCCH instead of the 2-digit MNC only when the current cell band is PCS and the 3 Digit MNC for PCS parameter is set to on.

Related Topics

“Frequency Banded Parameters” on page 109

“Band Selection Parameters” on page 111

Configuring the Packet Data Traffic Channel (PDTCH)

The packet data traffic channel parameters are configured using the following call processing subsystem commands. For a complete list of GPIB commands in the call processing subsystem, refer to "CALL Subsystem" on page 162.

Packet Data Traffic Channel Parameters

Parameter	GPIB Command
Packet Data Traffic Channel Band	"CALL:PDTCH:BAND" on page 227
Packet Data Traffic Channel (ARFCN) - Selected band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) DCS band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) EGSM band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) GSM450 band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) GSM480 band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) GSM750 band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) GSM850 band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) PCS band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) PGSM band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Packet Data Traffic Channel (ARFCN) RGSM band	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Downlink Burst Power Reduction Selection	"CALL:PDTCH:PREDuction:BURSt[1|2|3|4]" on page 235
Unused Downlink Burst Power Reduction Selection	"CALL:PDTCH:PREDuction:UBURst" on page 236
Downlink Power Reduction Level (dB)	"CALL:PDTCH:PREDuction:LEVel[1|2]" on page 235
Data Connection Type	"CALL:FUNCtion:DATA:TYPE" on page 211

Parameter	GPIB Command
Data Connection Frame Number Type	"CALL:FUNCtion:DATA:FRAMe:STARt" on page 208
Data Connection LLC Frame Check Sequence	"CALL:FUNCtion:DATA:BLER:LLC:FCSequence" on page 206
BLER Block Polling Interval	"CALL:FUNCtion:DATA:BLER:POLLing:INTerval" on page 206
Payload Pattern (BLER)	"CALL:FUNCtion:DATA:PAYLoad:PATTern:BLER" on page 209
Payload Pattern (ETSI B)	"CALL:FUNCtion:DATA:PAYLoad:PATTern:ETSIB" on page 210
Downlink Burst Current Absolute Power Level	"CALL:PDTCH:POWer[:AMPLitude]:BURSt[1|2|3|4]?" on page 234
Unused Downlink Burst Current Absolute Power Level	"CALL:PDTCH:POWer[:AMPLitude]:UBURst?" on page 234
PDTCH Coding Scheme	"CALL:PDTCH:CSCHeme" on page 228
Multislot Configuration	"CALL:PDTCH:MSLot:CONFiguration" on page 232
P0 for Downlink PDTCH	"CALL:PDTCH:PZERo:LEVel" on page 237
First Downlink Burst to Loop	"CALL:PDTCH:MSLot[:FIRSt]:DOWNlink:LOOPback[:BURSt]" on page 233
Packet Power Timing Advance State	"CALL:PDTCH:PMESsage:PPTadvance" on page 233
Packet Timeslot Reconfigure State	"CALL:PDTCH:PMESsage:PTReconfig" on page 233
Deferred Parameters	
Deferred Packet Data Traffic Channel Band	"CALL:SETup:PDTCH:BAND" on page 260
Deferred Packet Data Traffic Channel (ARFCN)	"CALL:SETup:PDTCH[:ARFCn][:SELected]" on page 255
Deferred Packet Data Traffic Channel (ARFCN) DCS band	"CALL:SETup:PDTCH[:ARFCn]:DCS" on page 255
Deferred Packet Data Traffic Channel (ARFCN) EGSM band	"CALL:SETup:PDTCH[:ARFCn]:EGSM" on page 256
Deferred Packet Data Traffic Channel (ARFCN) GSM450 band	"CALL:SETup:PDTCH[:ARFCn]:GSM450" on page 257
Deferred Packet Data Traffic Channel (ARFCN) GSM480 band	"CALL:SETup:PDTCH[:ARFCn]:GSM480" on page 257
Deferred Packet Data Traffic Channel (ARFCN) GSM750 band	"CALL:SETup:PDTCH[:ARFCn]:GSM750" on page 258

Parameter	GPIB Command
Deferred Packet Data Traffic Channel (ARFCN) GSM850 band	"CALL:SETup:PDTCH[:ARFCn]:GSM850" on page 258
Deferred Packet Data Traffic Channel (ARFCN) PCS band	"CALL:SETup:PDTCH[:ARFCn]:PCS" on page 259
Deferred Packet Data Traffic Channel (ARFCN) PGSM band	"CALL:SETup:PDTCH[:ARFCn]:PGSM" on page 259
Deferred Packet Data Traffic Channel (ARFCN) RGSM band	"CALL:SETup:PDTCH[:ARFCn]:RGSM" on page 260
Deferred PDTCH Coding Scheme	"CALL:SETup:PDTCH:CSCHeme" on page 260
Deferred Multislot Configuration	"CALL:SETup:PDTCH:MSLot:CONFiguration" on page 272
Deferred P0 for Downlink PDTCH	"CALL:SETup:PDTCH:PZERo:LEVel" on page 272

Using Deferred Parameters

Deferred parameters allow you to set up multiple parameters without implicit over-the-air signaling taking place. Using deferred parameters offers the following benefits:

- Code construction is more succinct.
- Only one signaling exchange between the test set and the mobile station sets up multiple parameters rather than a separate exchange for each parameter.
- Once the current data connection has been established, you can set up the next set of deferred parameters.

Operating Considerations

When configuring the base station emulator you must configure the broadcast channel (see "CALL:BCHannel" on page 179) and the packet data traffic channel (PDTCH). There are a number of parameters for the BCH and the PDTCH that can be configured; however, the test set's default parameters should allow a properly functioning GPRS mobile station to successfully establish a data connection under most circumstances.

PDTCH (ARFCN) is a frequency banded parameter (see "Frequency Banded Parameters" on page 109).

Related Topics

"Configuring the Broadcast Channel (BCH)" on page 104

"Configuring Mobile Station Operating Parameters" on page 100

"Packet Data Traffic Channel Band Parameter" on page 111

"CALL:PDTCH|PDTChannel" on page 224

"Testing a GPRS Mobile Station" on page 125

Frequency Banded Parameters

The majority of the test set's parameters are active regardless of the frequency band selected. There are a number of parameters for GPRS that allow you to specify a band; PGSM, EGSM, GSM450, GSM480, GSM750, GSM850, DCS, PCS or RGSM. These exceptions are called frequency banded parameters.

Frequency banded parameters are activated upon selection of a band. Parameters that select frequency bands include cell band and traffic band (see "Band Selection Parameters" on page 111).

You can set parameter values for a band that is not currently selected, and the test set stores the settings for future use. For example, during a call on the PGSM band, the MS TX level can be set to 10 for the DCS frequency band. When a handover (see "How the Test Set Performs a Dualband Handover" on page 99) to the DCS band is made, the MS TX level of 10 for DCS will already be set.

If you do not specify a frequency band when setting frequency banded parameters, settings to the parameter are made in the currently selected band.

GPRS Frequency Banded Parameters

Parameter	GPIB Command
Broadcast Channel (ARFCN)	"CALL[:CELL]:BCHannel[:ARFCn][:SELected][:SELected]" on page 181
BA Table	"CALL[:CELL]:BA:TABLe[:SELected][:SELected]" on page 166
Packet Data Traffic Channel (ARFCN)	"CALL:PDTCH[:ARFCn][:SELected]" on page 227
Uplink Burst TX Level	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230

Programming Example

The following procedure assumes that a data connection has been established between the test set and the mobile station (connection status is Transferring). See "Programming Example 3: Make a connection" on page 119.

```
10  OUTPUT 714;"CALL:PDTCH:PGSM 124" !Sets packet data traffic channel to 124 for PGSM
20                                   !band.
30  OUTPUT 714;"CALL:MS:TXL:PGSM 7" !Sets the mobile station uplink power control
40                                  !level to 7 for PGSM band.
50  ! Now set up frequency banded parameters for DCS band.
60  OUTPUT 714;"CALL:PDTCH:DCS 850" !Sets packet data traffic channel to 850 for DCS band.
70                                  !The default packet data traffic channel for the DCS
80                                  !band is 30.
90  OUTPUT 714;"CALL:MS:TXL:DCS 5" !Sets the mobile station uplink power control
100                                !level to 5 for the EGSM band. The default level is
110                                !15.
120 ! Now change the packet data traffic channel band to DCS. The PDTCH and uplink power
130 ! control level parameters are set to the values you specified above, not the
140 ! default values.
150 OUTPUT 714;"CALL:PDTCH:BAND DCS"
160 ! Now query the packet data traffic channel and uplink power control level.
```

```
170 OUTPUT 714;"CALL:PDTCH?"
180 ENTER 714;Channel
190 OUTPUT 714;"CALL:MS:TXL?"
200 ENTER 714;Tx_lev
210 ! Print the current values.
220 PRINT "The default PDTCH for the DCS band is 30. The current PDTCH is: ";Channel
230 PRINT "The default Tx Level is 15. The current Tx Level is: ";Tx_lev
240 END
```

Related Topics

"Band Selection Parameters" on page 111

"How the Test Set Performs a Dualband Handover" on page 99

"Configuring the Broadcast Channel (BCH)" on page 104

"Configuring the Packet Data Traffic Channel (PDTCH)" on page 106

Band Selection Parameters

Band selection parameters allow you to choose the frequency band for different channel types in GPRS.

GPRS Band Selection Parameters

Parameter	GPIB Command
Cell Band	"CALL[:CELL]:BAND[:SELected]" on page 177
Packet Data Traffic Channel Band	"CALL:PDTCH:BAND" on page 227

Operating Considerations for GPRS

Cell Band Parameter

- When the data connection status is *not* transferring (see "Data Connection Processing State Synchronization" on page 155), changing the cell band parameter to a new band changes the packet data traffic channel band to the new band as well.
- When the data connection status is transferring (see "Data Connection Processing State Synchronization" on page 155), changing the cell band parameter will disconnect any data connection in progress.

Packet Data Traffic Channel Band Parameter

- When the data connection status is transferring (see "Data Connection Processing State Synchronization" on page 155), changing the packet data traffic band parameter selects the PDTCH ARFCN and uplink burst TX level parameters. However, the setting will not be applied until you re-start the data connection using "CALL:FUNCtion:DATA:STARt" on page 210.

Related Topics

"Configuring the Broadcast Channel (BCH)" on page 104

"Configuring the Packet Data Traffic Channel (PDTCH)" on page 106

"CALL:STATus[:STATe]:DATA?" on page 280

"Programming Examples" on page 185

Bursted Parameters

The majority of the test set's base station emulator parameters allow you to set or query a single value which is applied to all allowed burst (or timeslot) locations. However, there are a number of parameters for GPRS that have a :BURSt suffix. The :BURSt suffix indicates that the parameter name refers to a set of parameters, one for each of the possible bursts. These are called bursted parameters.

Bursted parameters use the concept of an active burst. An active burst is a timeslot that is expected to contain RF power relating to a traffic channel based on the multislot configuration. Bursted parameters are activated when the burst you have set a value for becomes active.

Bursted parameters are useful when changing the multislot configuration. For example, they allow you to specify the uplink burst TX level for a burst that is not currently active.

The GPIB command for each bursted parameter lets you specify one of the allowable bursts. If you do not specify a burst number, then burst one is assumed. The burst numbers you specify are relative from the first active uplink or downlink burst.

GPRS Bursted Parameters

Parameter	GPIB Command
Downlink Burst Absolute Power Level	"CALL:PDTCH:POWer[:AMPLitude]:BURSt[1|2|3|4]?" on page 234
Downlink Burst Power Reduction Selection	"CALL:PDTCH:PREDuction:BURSt[1|2|3|4]" on page 235
Uplink Burst TX Level	"CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]" on page 230

Operating Considerations

The following bursted parameters are also frequency banded parameters (see "Frequency Banded Parameters" on page 109):

- Uplink Burst TX Level

Related Topics

"Configuring the Packet Data Traffic Channel (PDTCH)" on page 106

"CALL:PDTCH|PDTChannel" on page 224

Establishing a Data Connection with the Mobile Station

For instructions and a programming example on how to make a data connection, see “Programming Example 3: Make a connection” on page 119.

Related Topics

“CALL:PDTCH|PDTChannel” on page 224

“CALL:FUNCtion:DATA:STARt” on page 210

“Data Connection Processing State Synchronization” on page 155

3 Programming

Programming Example 1: Set up the Test Set

This example shows how to:

- "Fully Preset the Test Set"
- "Turn on the GPIB Debugger"
- "Set Test Set's Operating Mode"

Fully Preset the Test Set

```
330 OUTPUT Test_set;"*RST"
340 !
390 OUTPUT Test_set;"SYST:COMM:GPIB:DEB:STAT ON"
400 !
410 OUTPUT Test_set;"CALL:OPER:MODE CELL"
```

Turn on the GPIB Debugger

Set the Test Set's Operating Mode

Fully Preset the Test Set

To set up the test set, you begin by sending the *RST command. The *RST is used to perform a full preset of the test set, returning it to a known state.

Turn on the GPIB Debugger

Another useful tool that you may want to turn on at this time is the GPIB command debugger. While turned on, error messages appear on the test set's screen when the test set receives an unknown GPIB command. The message contains information about what type of error was caused and indicates where in the syntax the error occurred. Troubleshooting, like locating and fixing typing errors for example, becomes easier using the GPIB command debugger.

NOTE The SYST:COMM:GPIB:DEB:STAT ON command assists you when debugging code. This command should be taken out of your code once development is completed.

Set Test Set's Operating Mode

The `CALL:OPER:MODE` command in the diagram is used to set the test set's operating mode to active cell. This means call processing is used to maintain a link between the test set and the mobile station.

There are also three test mode operating modes available. These test modes are useful when you are operating the mobile station in test mode.

Programming Example 2: Configure Test Set and Mobile Station Parameters

This example shows how to:

- "Set up data connection synchronization parameters"
- "Configure the Broadcast Channel Parameters"
- "Configure the Packet Data Traffic Channel Parameters"
- "Configure the Mobile Station Operating Conditions"

Set up data connection synchronization parameters

You may choose to set the data connection synchronization timeout parameter at this point in the program. The data connection synchronization command associated with this timeout parameter is used in "Programming Example 3: Make a connection" on page 119 and "Programming Example 5: End the Connection" on page 123.

```
490   OUTPUT Test_set;"CALL:DCON:TIM 10"
```

NOTE Many of the parameters are being configured to their default values. In your program, it may be desirable to explicitly configure these parameters to ensure that the required settings have not been changed by someone setting a parameter's value through the test set's front panel. However, greater code efficiency can be achieved by not configuring them.

Configure the Broadcast Channel Parameters

The programming example below illustrates configuring the active band to PGSM and setting the cell power to -80 dBm.

```
520   OUTPUT Test_set;"CALL:BAND PGSM"! Set active broadcast band
530   OUTPUT Test_set;"CALL:POW -80"  ! Set cell power to -80 dBm.
```

Configure the Packet Data Traffic Channel Parameters

In the next example, several packet data traffic channel parameters are specified. Note that the PDTCH ARFCN is set to 45. This is on a different ARFCN than the broadcast channel (20 is the default broadcast channel ARFCN for PGSM), allowing the use of the power reduction levels specified and assigned to the downlink bursts.

```
550   !  Set the Packet Data Traffic Channel Parameters
560   OUTPUT Test_set;"CALL:PDTCH 45" ! Set packet data traffic channel
570   !  Set Data Connection Type to BLER
580   OUTPUT Test_set;"CALL:FUNC:DATA:TYPE BLER"
590   !
600   !  The following commands are helpful in enabling the test set to
610   !  establish a data connection with mobiles which cannot establish
620   !  a BLER data connection under normal conditions. These are
```

```
630   !  commented out. If you wish to use them, remove “!”.
640   !
650   !  Set the test set to send an invalid FCS to the mobile
660   !OUTPUT Test_set;”CALL:FUNC:DATA:BLER:LLC:FCS CORR”!
670   !  Set the block polling interval used during BLER connection
680   !OUTPUT Test_set;”CALL:FUNC:DATA:BLER:POLL:INT 4”! Set polling rate
690   !  Set the type of frame numbering scheme used during attach.
700   !OUTPUT Test_set;”CALL:FUNC:DATA:FRAM:STAR ABS”! Absolute attach
710   !
720   ! Set Multi-slot Configuration to two downlinks and one uplinks.
730   OUTPUT Test_set;”CALL:PDTCH:MSL:CONF D2U1”
740   OUTPUT Test_set;”CALL:PDTCH:CSCH CS2”! Set Coding Scheme to CS2
750   !
760   ! Assign values to the power reduction levels
770   OUTPUT Test_set;”CALL:PDTCH:PZER:LEV 18”   ! Assign a value to P0
780   OUTPUT Test_set;”CALL:PDTCH:PRED:LEV2 6”! Set PRL2 to 6 dB
790   !
800   ! Assign power reduction levels to the downlink bursts
810   ! Assign Burst 2 a PRL of 6 dB
820   OUTPUT Test_set;”CALL:PDTCH:PRED:BURS2 PRL2”
```

Configure the Mobile Station Operating Conditions

The example below illustrates how to assign mobile station transmit levels to one uplink burst.

```
850   OUTPUT Test_set;”CALL:PDTCH:MS:TXL:BURS 5”
```

Programming Example 3: Make a connection

This example shows how to make a connection with the mobile station. The two actions you must perform to accomplish this are:

- "Mobile Station performs a GPRS Attach"
- "Start a Data Connection"

Mobile Station performs a GPRS Attach

The mobile station must initiate a GPRS attach. It is assumed the phone is turned on and is attempting a GPRS attach. The following code queries the test set for the connection status and then stops the program if an attached state is not reached within one minute. This gives adequate time for the mobile station to attach.

Synchronization between the control program and the test set is maintained by querying the test set for the state of the connection between it and the mobile station. When a GPRS Attach is being performed, the `CALL:ATT?` hanging query is the appropriate query to use. It will return a "1" when the mobile station is attached and a "0" otherwise. A state change detector is also armed to ensure the query does not stop hanging before the state transition from "IDLE" to "ATTached" is able to begin. Finally, to prevent the query from hanging indefinitely, which could occur if the mobile station is not turned on or not sent the correct commands, a timeout is set for this query. In this example, 10 seconds is the value assigned to the timeout. After 10 seconds, the change detector is disarmed and the query returns either a "1" or "0".

```
1320  DISP "Turn the phone on now.  Make the phone perform a GPRS attach."
1330  Start_time=TIMEDATE
1340  LOOP
1350    OUTPUT Test_set;"CALL:DCON:ARM"
1360    OUTPUT Test_set;"CALL:ATT?"
1370    ENTER Test_set;Att_state
1380   EXIT IF Att_state
1390    Current_time=TIMEDATE-Start_time
1400    IF Current_time>=Timer THEN       ! Timer value is 1 minute
1410      BEEP
1420      DISP ""
1430      PRINT "GPRS attach did not complete. Program terminated."
1440      STOP
1450    END IF
1460  END LOOP
```

Start a Data Connection

Once the mobile station has successfully attached, you can start the data connection using the `CALL:FUNC:DATA:STAR` command. The `CALL:FUNC:DATA:STAR` command is a overlapped command, meaning the test set accepts other commands before completely processing this command. Because this is an overlapped command, synchronization is maintained by using the `CALL:TRAN?` hanging query. It allows the test set to initiate the data connection and then returns a "1" if the data connection starts successfully and a "0" if the state of the connection returns to either "IDLE" or "ATTached". Because the test set originated the data connection, it is not necessary to assign a timeout value or arm the change detector for this query. Instead, there is a default timer associated with this query and the change detector is armed automatically.

Programming Example 3: Make a connection

```
1490  OUTPUT Test_set;"CALL:FUNC:DATA:STAR"
1500  OUTPUT Test_set;"CALL:TRAN?"
1510  ENTER Test_set;Tran_state
1520  IF NOT Tran_state THEN
1530    DISP ""
1540    DISP "Data connection failed.  Trying again."
1550  OUTPUT Test_set;"CALL:FUNC:DATA:STAR"
1560  OUTPUT Test_set;"CALL:TRAN?"
1570  ENTER Test_set;Tran_state
1580  IF NOT Tran_state THEN
1590    BEEP
1600    DISP ""
1610    PRINT "Data connection failed.  Program terminated."
1620    STOP
1630  END IF
1640  DISP "Data connection started sucessfully."
1650  END IF
```

Programming Example 4: Reconfigure Test Set and Mobile Station Connection Parameters

There are several ways you may want to reconfigure the connection parameters during your program's execution. Some examples are:

- "Reconfigure the Mobile Station Parameters"
- "Reconfigure the connection to a new PDTCH ARFCN"
- "Reconfigure the connection to a new PDTCH ARFCN in a different band"

Reconfigure the Mobile Station Parameters

The example below illustrates how to change the mobile station's transmit level for burst 1 to level 10. The default burst for this command is burst 1.

```
1830  OUTPUT Test_set;”CALL:PDTCH:MS:TXL:BURS 10”
```

Reconfigure the connection to a new PDTCH ARFCN

When reconfiguring the connection to a new packet data traffic channel ARFCN, you may also want to change other parameters at the same time. In this case, using deferred parameter commands would create the most efficient code. The code below shows how to set a new mobile station TX level, PDTCH ARFCN, and coding scheme with deferred parameter commands, and then use the `CALL:HAND` command to apply the new parameters. The code also shows you how to use the `CALL:STAT:DATA?` synchronization command to make sure the connection was maintained. The `CALL:STAT:DATA?` query returns the current state of the connection. In this case, "TRAN" should be returned, indicating the connection is still in the transferring state and the handover was successful. This query can be used because the `CALL:HAND` command is sequential, meaning its operation completes before the test set accepts a new command.

```
2000  OUTPUT Test_set;”CALL:SET:PDTCH:MS:TXL:BURS 5”
2010  OUTPUT Test_set;”CALL:SET:PDTCH 120”
2020  OUTPUT Test_set;”CALL:SET:PDTCH:CSCH CS2”
2030  OUTPUT Test_set;”CALL:HAND”
2040  ! Use a call synchronization command to ensure the
2050  ! reconfiguration succeeded.
2060  OUTPUT Test_set;”CALL:STAT:DATA?”
2070  ENTER Test_set;Conn_status$
2080  IF Conn_status$<>”TRAN” THEN
2090     PRINT “Data connection failed to reconfigure properly.”
2100     PRINT “Program terminated.”
2110     STOP
2120  END IF
```

Reconfigure the connection to a new PDTCH ARFCN in a different band

When configuring the connection to a new band, remember to specify the band for the new mobile station TX level and PDTCH ARFCN. In the code below, DCS has been added to the commands for reconfiguring both these parameters. The result is that those parameters are stored until the DCS band is made active by the `CALL:HAND` command. If they are not specified as DCS band parameters, they become active immediately.

Programming Example 4: Reconfigure Test Set and Mobile Station Connection Parameters

Note that reconfiguring the connection to a new band uses the same synchronization method as changing to a new PDTCH.

```
2280  OUTPUT Test_set;”CALL:PDTCH:MS:TXL:DCS:BURS 15”
2290  OUTPUT Test_set;”CALL:PDTCH:DCS 665”
2300  OUTPUT Test_set;”CALL:PDTCH:BAND DCS”
2310  ! Use a call syncrhonization command to ensure the
2320  ! reconfiguration succeeded.
2330  OUTPUT Test_set;”CALL:STAT:DATA?”
2340  ENTER Test_set;Conn_status$
2350  IF Conn_status$<>”TRAN” THEN
2360     PRINT “Data connection failed to reconfigure properly.”
2370     PRINT “Program terminated.”
2380     STOP
2390  END IF
```

Programming Example 5: End the Connection

This example shows how to end the connection with the mobile station. The two actions you perform to accomplish this are:

- “End the Data Connection”
- “GPRS Detach”

End the Data Connection

The `CALL:FUNC:DATA:STOP` command ends the data connection. As in “Programming Example 3: Make a connection” on page 119, synchronization with the control program is important. The `CALL:FUNC:DATA:STOP` command is a sequential command, meaning its operation is completed before the test set accepts another command. Therefore, it is only necessary to use the `CALL:STAT:DATA?` query to ensure the data connection has ended and the connection is in the “ATTached” state.

```
2550  OUTPUT Test_set;”CALL:FUNC:DATA:STOP”
2560  OUTPUT Test_set;”CALL:STAT:DATA?”
2570  ENTER Test_set;Conn_status$
2580  IF Conn_status$<>”ATT” THEN
2590    PRINT “Unable to terminate data connection correctly.”
2600    PRINT “PROGRAM TERMINATED.”
2610    STOP
2620  END IF
```

GPRS Detach

The test set does not require you to perform a GPRS detach. No errors are generated if a GPRS detach is not performed. Therefore, you may choose to remove the tested phone after the data connection has ended.

There are two ways to initiate a GPRS Detach.

- “Initiating the GPRS Detach from the Test Set”
- “Mobile Station initiated GPRS Detach”

Initiating the GPRS Detach from the Test Set

The example below illustrates initiating a GPRS Detach from the Test Set.

```
2680  OUTPUT Test_set;”CALL:FUNC:DATA:DET”
2690  !
2700  Start_time=TIMEDATE
2710  LOOP
2720    OUTPUT Test_set;”CALL:DCON:ARM”
2730    OUTPUT Test_set;”CALL:ATT?”
2740    ENTER Test_set;Att_state
2750   EXIT IF NOT Att_state
2760    Current_time=TIMEDATE-Start_time
2770    IF Current_time>=Timer THEN
2780      DISP ““
2790      PRINT “GPRS detach did not occur. Program terminated”
```

```
2800      STOP
2810    END IF
2820    IF Conn_state$="DET" THEN
2830      DISP "GPRS detach is in process."
2840    END IF
2850  END LOOP
```

Mobile Station initiated GPRS Detach

The example below illustrates initiating a GPRS Detach from the mobile station.

```
DISP "Initiate a GPRS Detach"
Start_time=TIMEDATE
LOOP
  OUTPUT Test_set;"CALL:STAT:DATA?"
  ENTER Test_set;Conn_state$
 EXIT IF Conn_state$="IDLE"
  Current_time=TIMEDATE-Start_time
  IF Current_time>=Timer THEN
    DISP ""
    PRINT "GPRS detach did not occur. Program terminated"
    STOP
  END IF
  IF Conn_state$="DET" THEN
    DISP "GPRS detach is in process."
  END IF
END LOOP
```

Testing a GPRS Mobile Station

This section provides a description of how you may want to use the test set to test a GPRS mobile station which supports a single uplink timeslot or two adjacent uplink timeslots. The section contains:

- "Test Overview" on page 125
- "Procedure" on page 125
- "Operating Considerations" on page 128

Test Overview

To test a GPRS mobile station, you need to perform the following steps:

"1. Configure the base station emulator and mobile station" on page 125

"2. Switch on the GPRS mobile station, perform an attach and establish a data connection" on page 126

"3. Collect protocol data" on page 127

"4. Reconfigure the data connection and collect protocol data (if required)" on page 127

"5. Disconnect the Mobile Station from the base station emulator" on page 127

These steps are described in more detail in the next section.

Procedure

1. Configure the base station emulator and mobile station

Before starting to transfer data with a GPRS mobile station, you may need to configure some, or all of the following parameters:

- Broadcast channel (BCH) parameters:
  - — Cell Band (see "CALL[:CELL]:BAND[:SELected]" on page 177)
  - — Broadcast Channel (ARFCN) (see "CALL[:CELL]:BCHannel[:ARFCn][:SELected][:SELected]" on page 181)
  - — Cell Power (see "CALL[:CELL]:POWer:AMPLitude[:SELected]" on page 247)
- Packet data traffic channel (PDTCH) parameters:
  - — Packet Data Traffic Channel Band (see "CALL:PDTCH:BAND" on page 227)
  - — Packet Data Traffic Channel (ARFCN) (see "CALL:PDTCH[:ARFCn][:SELected]" on page 227)
  - — Packet Data Traffic Channel Coding Scheme (see "CALL:PDTCH:CSCHeme" on page 228)
  - — Downlink Packet Data Traffic Channel Power Control:
    - — Downlink Power Reference Level (dB) (see "CALL:PDTCH:PZERo:LEVel" on page 237)
    - — Downlink Power Reduction Level (dB) (see "CALL:PDTCH:PREDuction:LEVel[1|2]" on page 235)
    - — Downlink Burst Power Reduction Selection (see "CALL:PDTCH:PREDuction:BURSt[1|2|3|4]" on

page 235)

Note: In order to make use of power reduction levels, you must set the downlink PDTCHs to be on a different ARFCN from the broadcast channel. This is because the power level across all timeslots on the BCH must remain constant. Therefore, power reduction levels are ignored if the BCH and PDTCH are on the same ARFCN.

    — Unused Downlink Burst Power Reduction Selection (see “CALL:PDTCH:PREDuction:UBURst” on page 236)

    Note: In order to make use of power reduction levels, you must set the downlink PDTCHs to be on a different ARFCN from the broadcast channel. This is because the power level across all timeslots on the BCH must remain constant. Therefore, power reduction levels are ignored if the BCH and PDTCH are on the same ARFCN.

  — Packet Data Traffic Channel Protocol Control:

    — Packet Timeslot Reconfigure (see “CALL:PDTCH:PMESsage:PTReconfig” on page 233)

    — Packet Power Timing Advance (see “CALL:PDTCH:PMESsage:PPTadvance” on page 233)

  — Data Connection Parameters:

    — Data Connection Type (see “CALL:FUNCtion:DATA:TYPE” on page 211)

    — Data Connection Frame Number Type (see “CALL:FUNCtion:DATA:FRAMe:STARt” on page 208)

    — Data Connection LLC Frame Check Sequence (see “CALL:FUNCtion:DATA:BLER:LLC:FCSequence” on page 206)

    — BLER Block Polling Interval (see “CALL:FUNCtion:DATA:BLER:POLLing:INTerval” on page 206)

    — Payload Pattern (BLER) (see “CALL:FUNCtion:DATA:PAYLoad:PATTern:BLER” on page 209)

    — Payload Pattern (ETSI B) (see “CALL:FUNCtion:DATA:PAYLoad:PATTern:ETSIB” on page 210)

  — Multislot Configuration (see “CALL:PDTCH:MSLot:CONFiguration” on page 232)

  — First Downlink Burst to Loop (see “CALL:PDTCH:MSLot[:FIRSt]:DOWNlink:LOOPback[:BURSt]” on page 233)

- Mobile station operating parameters:

  — PDTCH MS TX Level (see “CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 230)

  — Guard Band Period Length (see “CALL:MS:TX:BURSt:GPLength” on page 217)

- Deferred parameters (if required):

  — Deferred parameters allow you to set up a new data connection ahead of time.This is useful if you plan to reconfigure the data connection after your first set of measurements to make more measurements on the new channel. The settings you make are only applied when a channel change is executed using the “CALL:HANDover | HANDoff[:IMMediate]” on page 212. For a list of the deferred parameters see “Configuring the Packet Data Traffic Channel (PDTCH)” on page 106. For more details on using deferred parameters see “Using Deferred Parameters” on page 108.

2. Switch on the GPRS mobile station, perform an attach and establish a data connection

Ensure the GPRS mobile station you want to test has either a GSM Test SIM card, or a standard GSM SIM card installed. When you connect your mobile station to the test set and switch the mobile station on, it should automatically perform a GPRS attach. (For those mobile stations which do not automatically perform a GPRS attach, you may have to instruct the mobile station to go into a data mode. The method for doing this will vary from one mobile station to another. For example, you may have to press a key on the mobile station's keypad, or make a selection from the mobile station's on-screen menu system.)

The mobile station must be GPRS attached before you can use the command "CALL:FUNCtion:DATA:STARt" on page 210 to start the data connection. You can verify that a data connection has been successfully established, by checking that the connection status is "transferring". (If you require more details on connection states see "Data Connection Processing State Synchronization" on page 155).

If you have problems starting the data connection with your mobile station under normal conditions, you may want to try changing the frame numbering scheme using the command "CALL:FUNCtion:DATA:FRAMe:STARt" on page 208.

If you have problems establishing a data connection using the BLER Data Connection Type specifically, you may want to change the setting of the Data Connection LLC Frame Check Sequence (see "CALL:FUNCtion:DATA:BLER:LLC:FCSequence" on page 206) or the BLER Block Polling Interval (see "CALL:FUNCtion:DATA:BLER:POLLing:INTerval" on page 206).

3. Collect protocol data

Now that the data connection is successfully established, you can start gathering protocol data. Output RF Spectrum, Transmit Power, Phase and Frequency Error, and Power versus Time are all available for GPRS. In addition, you can make Block Error measurements in parallel with your transmitter measurements.

You may want to vary the downlink power to stress the mobile's receiver during your testing (see "Downlink PDTCH Power Control" on page 128).

If you want the test set to perform Transmit Power, and Phase and Frequency Error measurements on both bursts of a multislot configuration which features two adjacent uplink timeslots, you can select only one burst at a time to measure.

To select a multislot configuration with two adjacent uplink timeslots (that is, D2U2 or D3U2) use "CALL:PDTCH:MSLot:CONFiguration" on page 232.

For more details on the process of making measurements and gathering results, see.

4. Reconfigure the data connection and collect protocol data (if required)

You may choose to reconfigure the data connection and collect protocol data. To do this, you can execute a channel change using the "CALL:HANDover | HANDoff[:IMMediate]" on page 212. This applies the deferred parameters that you set earlier (see Deferred Parameters above). If you require more details on the process of reconfiguring the data connection, see "Programming Example 4: Reconfigure Test Set and Mobile Station Connection Parameters" on page 121.

Note that additional PDTCH protocol control parameters are available in case your mobile station does not support the Packet Timeslot Reconfigure (PTR) message. (If you require details on these parameters, see "CALL:PDTCH:PMESsage:PPTadvance" on page 233 and "CALL:PDTCH:PMESsage:PTReconfig" on page 233).

5. Disconnect the Mobile Station from the base station emulator

When your testing is complete, you need to end the data connection (using "CALL:FUNCtion:DATA:STOP" on page 210) and then initiate the GPRS detach procedure from the mobile station. If you require more details, see “Programming Example 5: End the Connection” on page 123. You should note that the GPRS detach procedure is optional in a testing environment. The test set can be left in the Attached data connection state and will recognize if a different mobile station performs a GPRS attach.

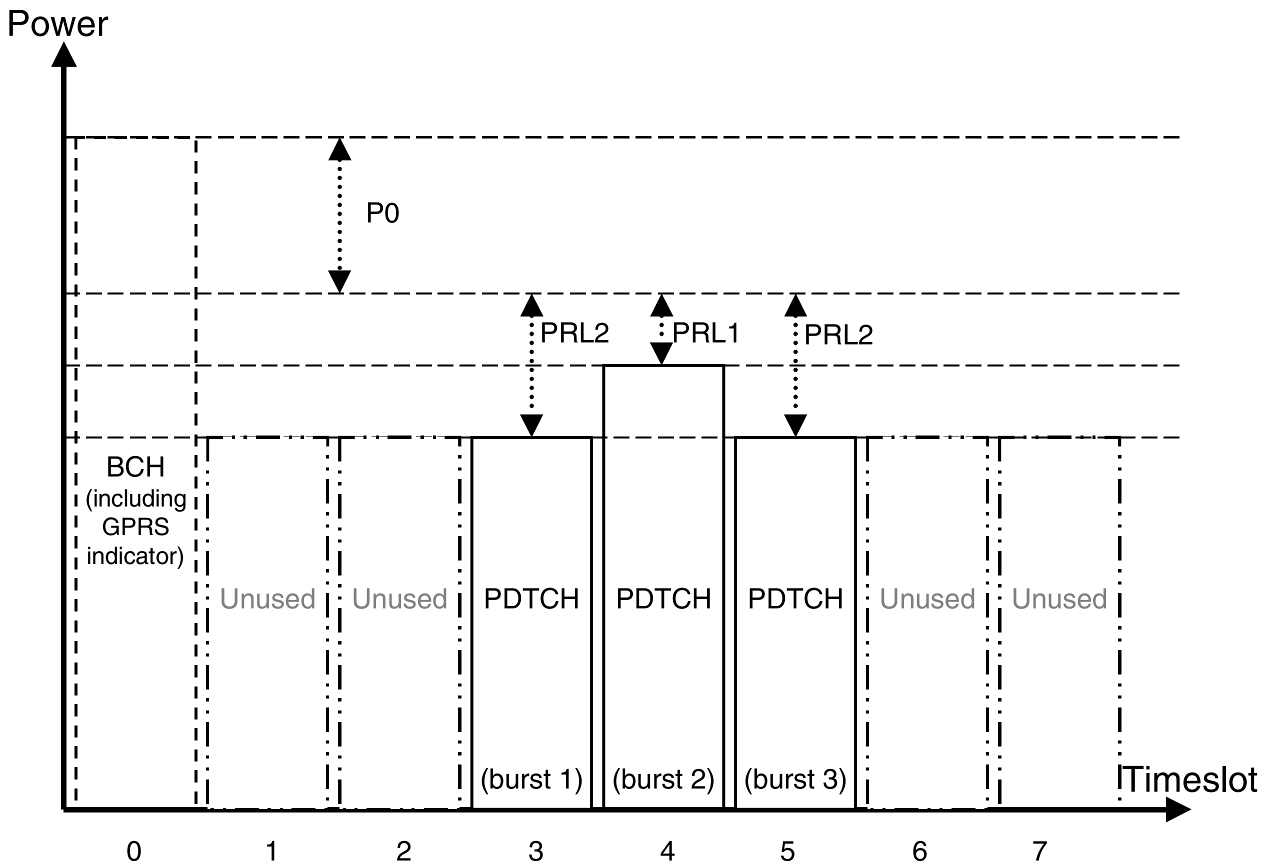
Operating Considerations

Downlink PDTCH Power Control

For GPRS-specific testing of mobile stations, you must take into consideration the multislot mode of operation (where a single packet data connection uses multiple timeslots on the same ARFCN possibly at different power levels). In GPRS, downlink power levels are referenced to the power reduction reference level (which in turn is referenced to the BCCH). ETSI refers to these power reduction levels as PR values, and the reference level is known as P0. In the test set, the power reduction levels are implemented as two values (PRL1 and PRL2) which can be mapped to any downlink burst.

P0, PRL1, and PRL2 are shown in the figure below. Note that the BCH (including GPRS indicator) is shown on the same ARFCN in the figure only to illustrate the BCH level. To make use of power reduction levels, you must set the downlink PDTCHs to be on a different ARFCN from the BCH.

Figure 5. GPRS Power Reduction Levels



Use the following commands to set the BCH power, P0 reference level, and PDTCH power reduction levels:

- To set the Cell Power (BCH power level), use "CALL[:CELL]:POWer:AMPLitude[:SELected]" on page 247.
- To set the P0 Reference Level, use "CALL:PDTCH:PZERo:LEVel" on page 237.
- To set the Downlink Power Reduction Level (dB) for PRL1 and PRL2, use "CALL:PDTCH:PREDuction:LEVel[1|2]" on page 235.
- To make the Downlink Burst Power Reduction Selection (either PRL1 or PRL2) for each PDTCH burst, use "CALL:PDTCH:PREDuction:BURSt[1|2|3|4]" on page 235.
- To make the Unused Downlink Burst Power Reduction Selection (either PRL1 or PRL2) for all PDTCH bursts that are *not* being used for transmitting downlink PDTCH(s), use "CALL:PDTCH:PREDuction:UBURst" on page 236.

Related Topics

"Programming Examples" on page 185

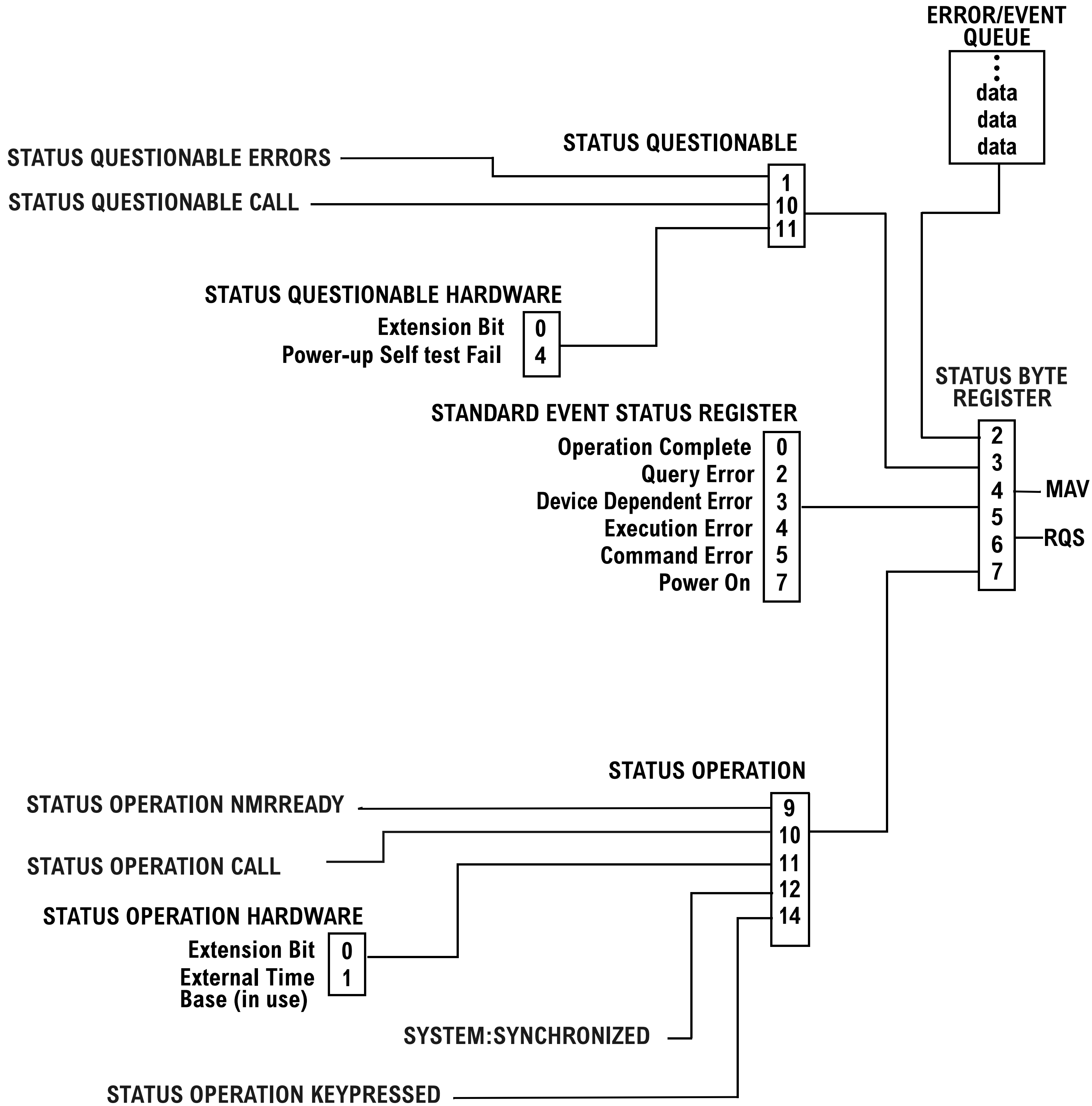
"Active Cell Operating Mode" on page 101

"Broadcast Channel Parameters" on page 104

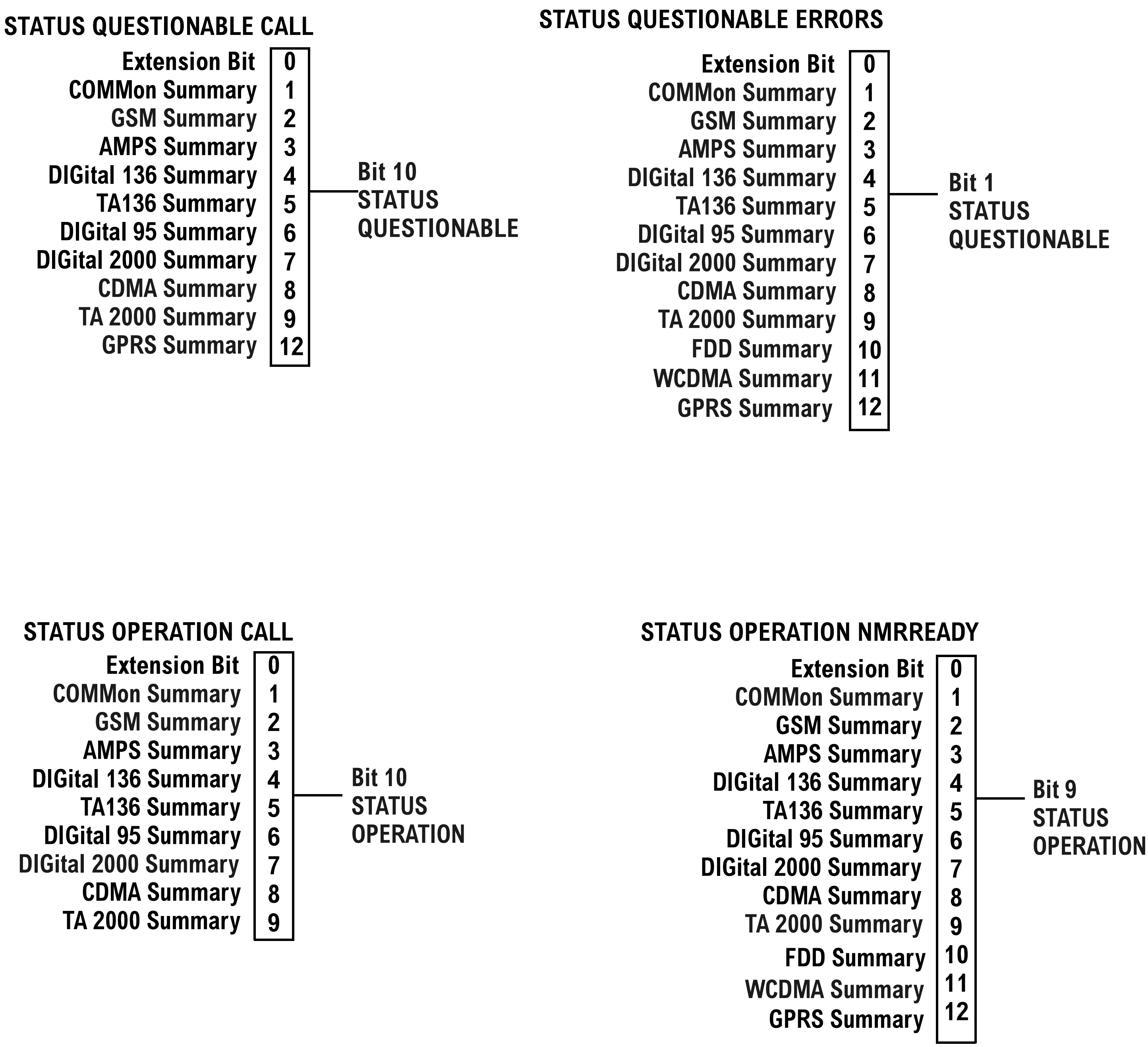
"Configuring the Packet Data Traffic Channel (PDTCH)" on page 106

Status Subsystem Overview

Overview of STATus Reporting Structure

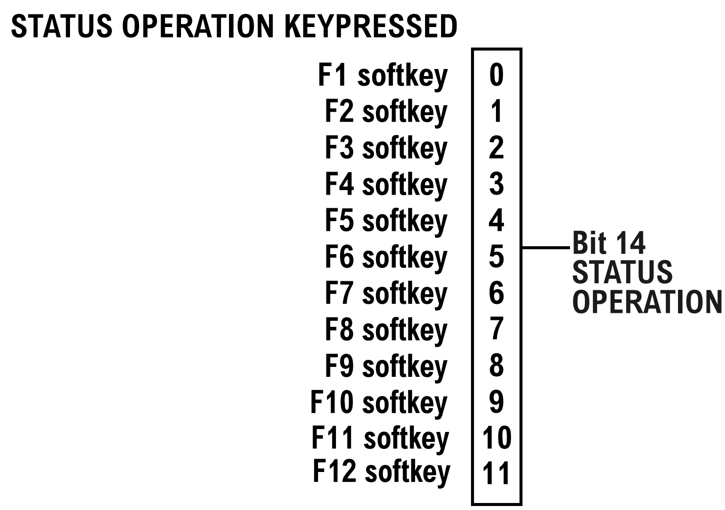


Status Reporting Structure for STATus QUEStionable and STATus OPERation



Note: Some status registers are not functional at this time.

Status Reporting Structure for STATus OPERation KEYPressed Register



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

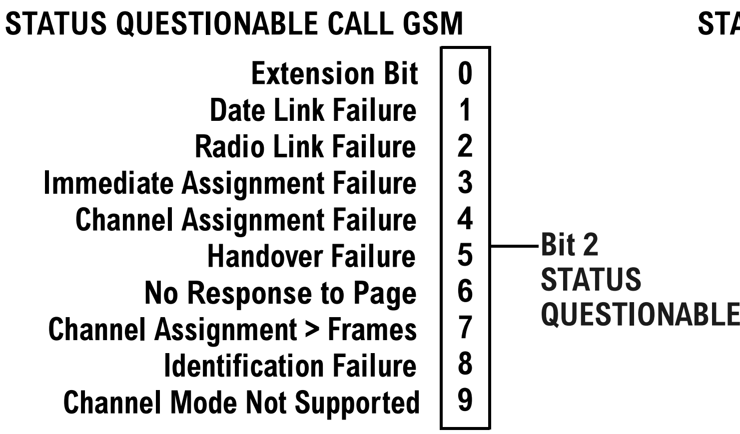
Bit 14 STATUS OPERATION CALL COMMON

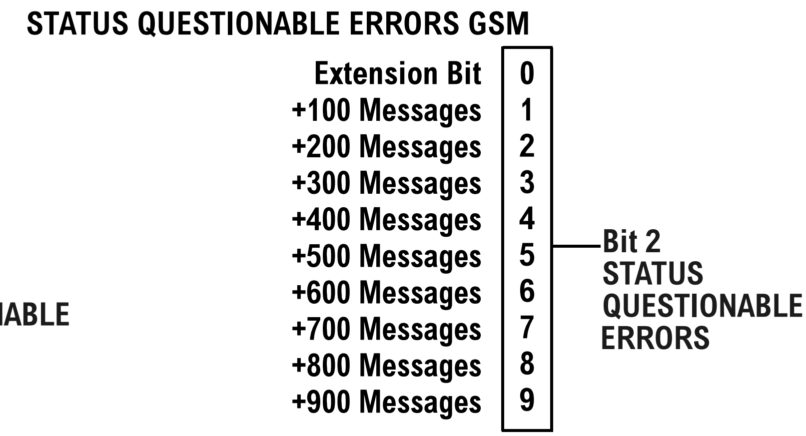
STATUS OPERATION NMRREADY COMMON

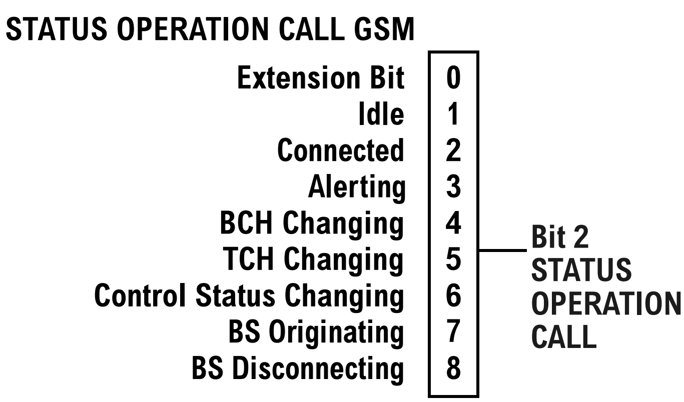
Extension Bit	0
Audio Analyzer	1
Swept Audio	2
Spectrum Monitor	3

Bit 1 STATUS OPERATION NMRREADY

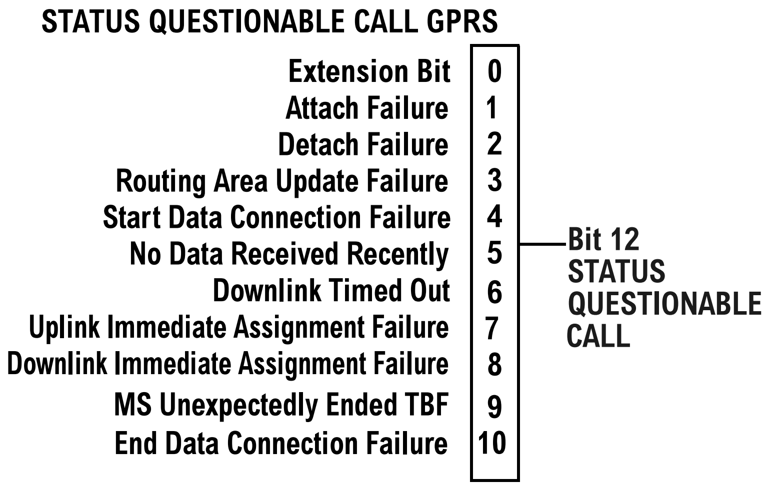
Status Reporting Structure for the GSM Registers

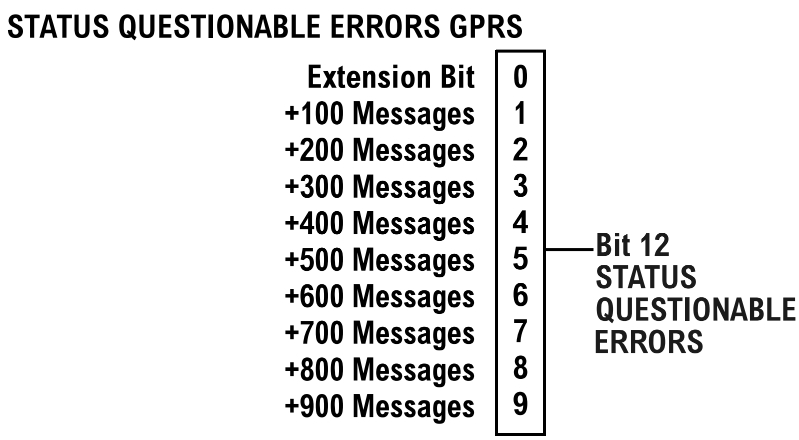




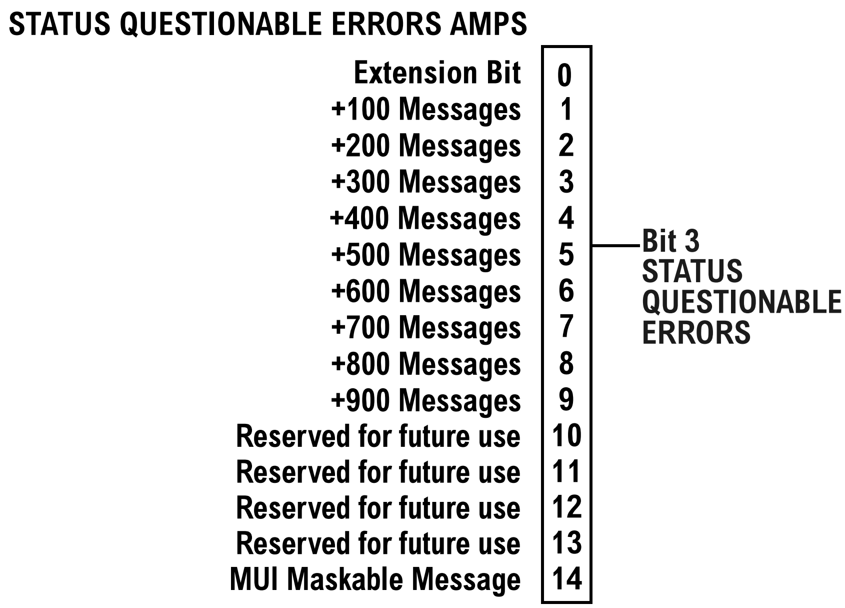


Status Reporting Structure for the GPRS Registers

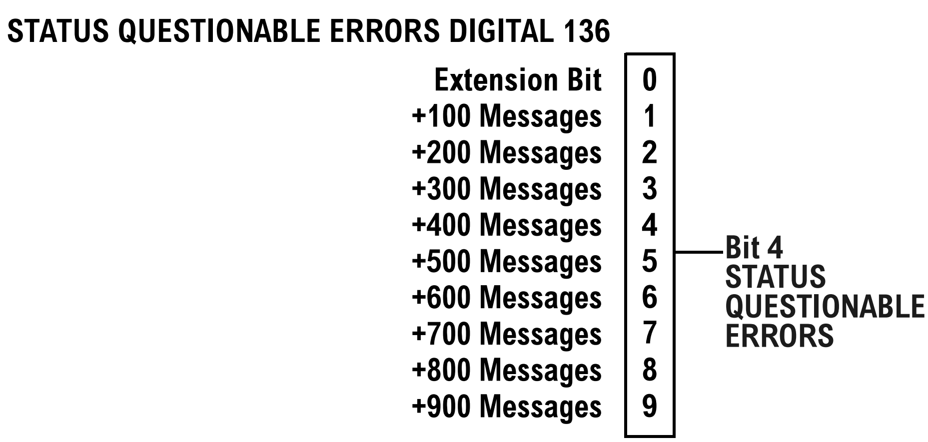




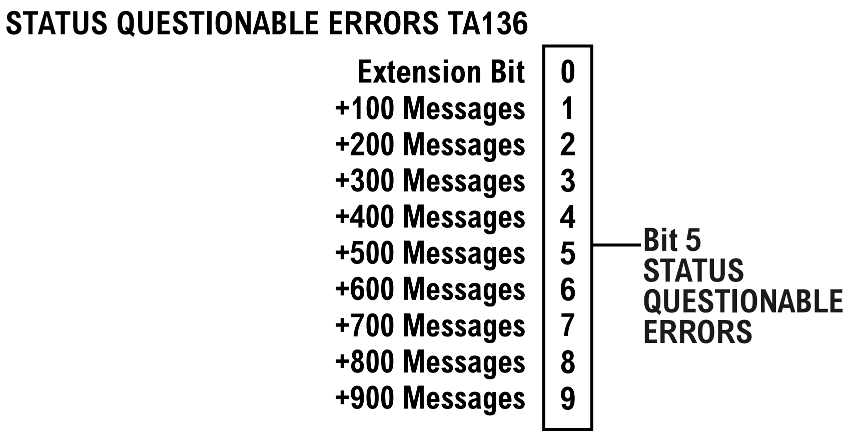
Status Reporting Structure for the AMPS Registers



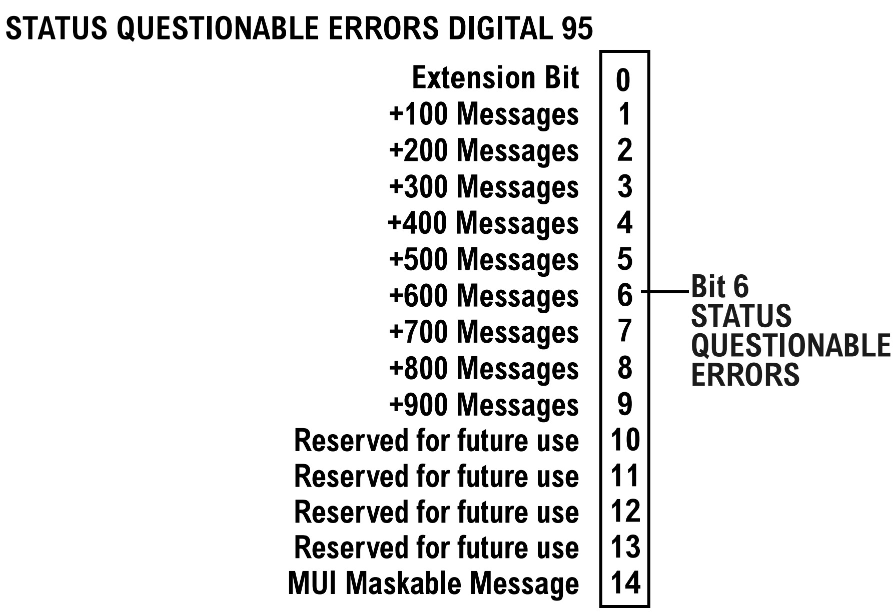
Status Reporting Structure for the DIGital136 Registers



Status Reporting Structures for the TA136 Registers



Status Reporting Structure for the DIGital95 Registers



Status Reporting Structure for the DIGital 2000 Registers

STATUS QUESTIONABLE ERRORS DIGITAL 2000

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 7
STATUS
QUESTIONABLE
ERRORS

STATUS OPERATION CALL DIGITAL 2000

Extension Bit	0
F-SCH Synchronized	1

Bit 7
STATUS
OPERATION
CALL

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 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
+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 9 STATUS QUESTIONABLE ERRORS

STATUS QUESTIONABLE CALL TA 2000

Extension Bit	0
Release order not received	1
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

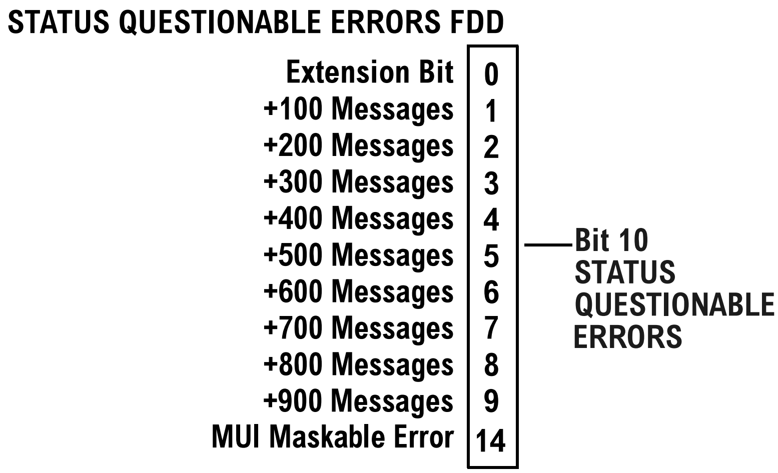
Bit 9 STATUS QUESTIONABLE CALL

STATUS OPERATION NMRREADY TA 2000

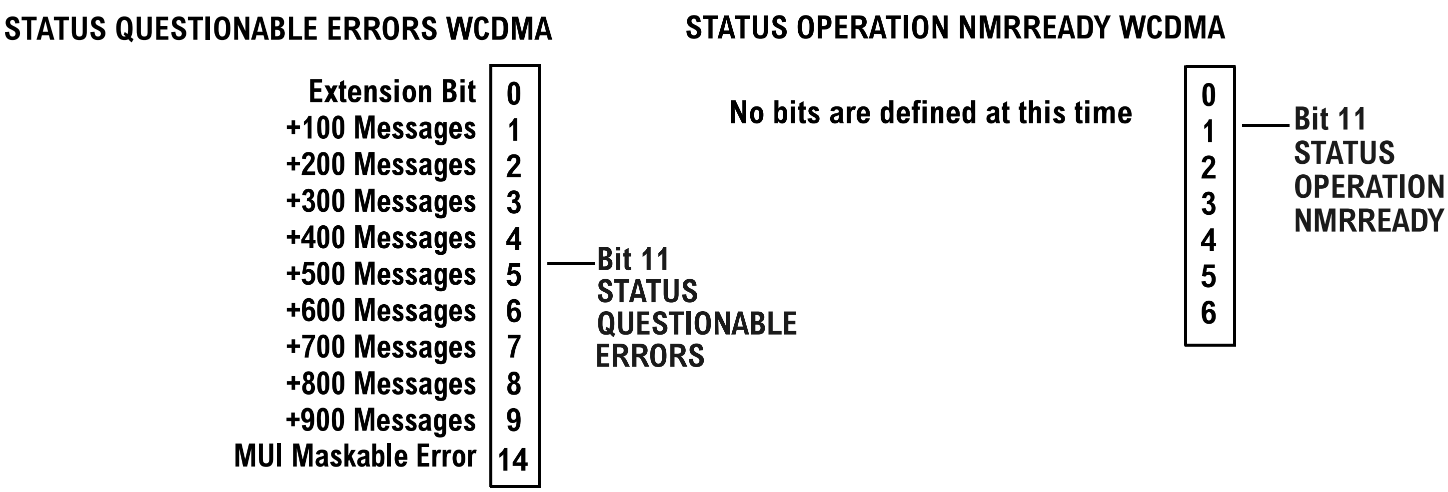
Reserved for future use	0
Reserved for future use	1
Reserved for future use	2
Reserved for future use	3

Bit 9 STATUS OPERATION NMRREADY

Status Reporting Structure for the FDD Registers

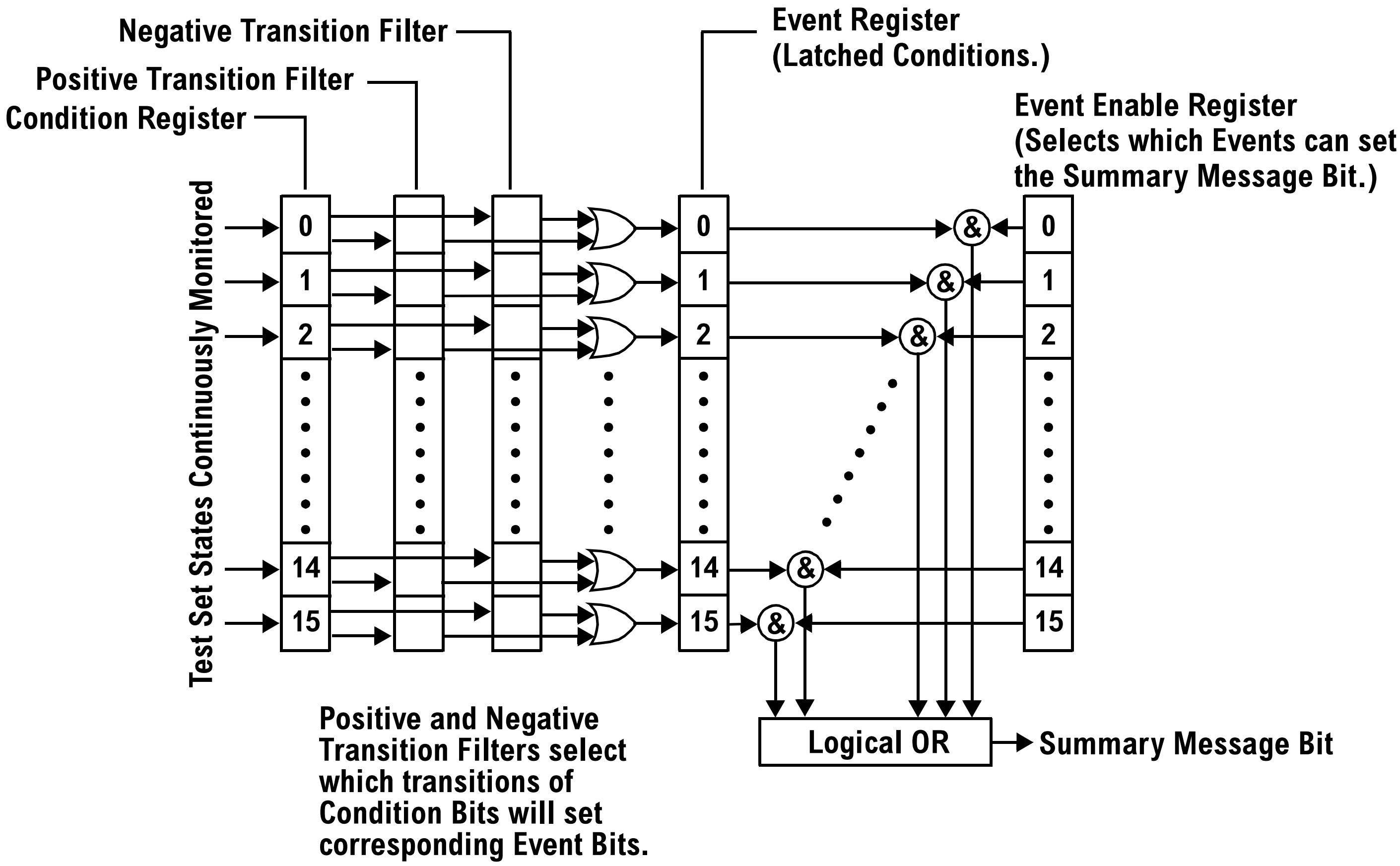


Status Reporting Structure for the WCDMA Registers



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.

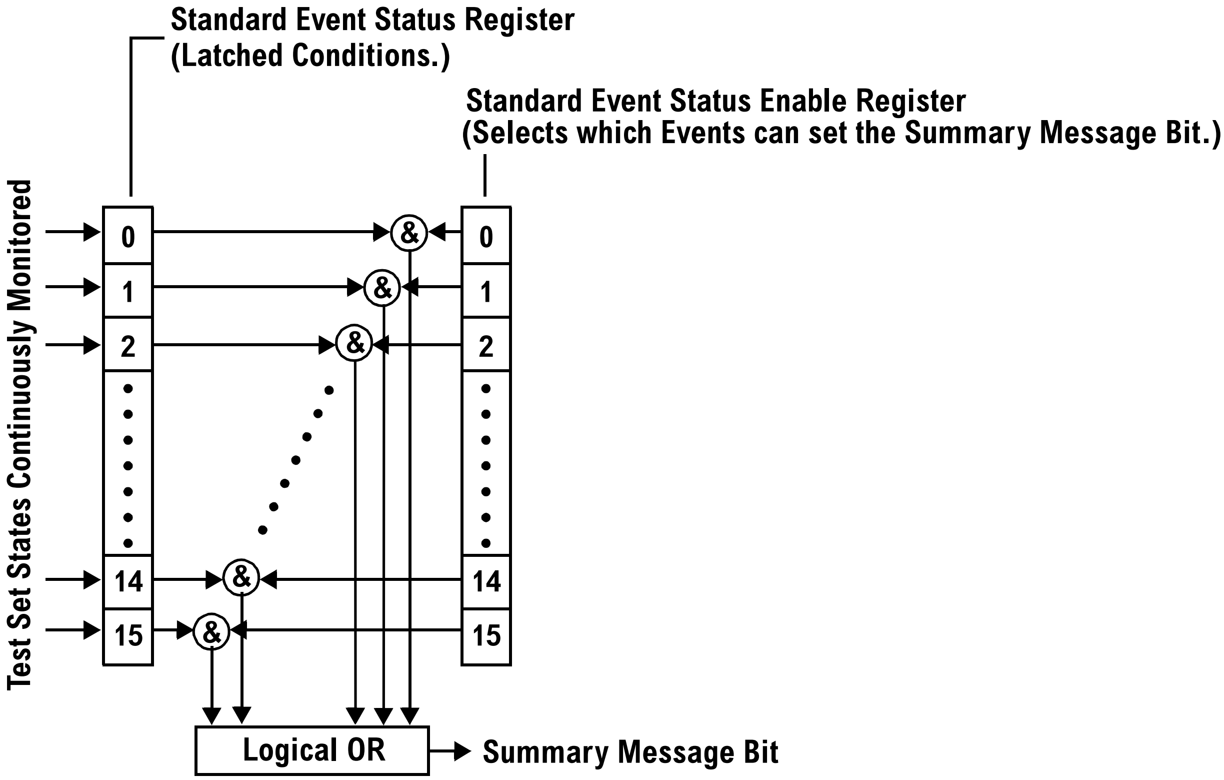
Event Register

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



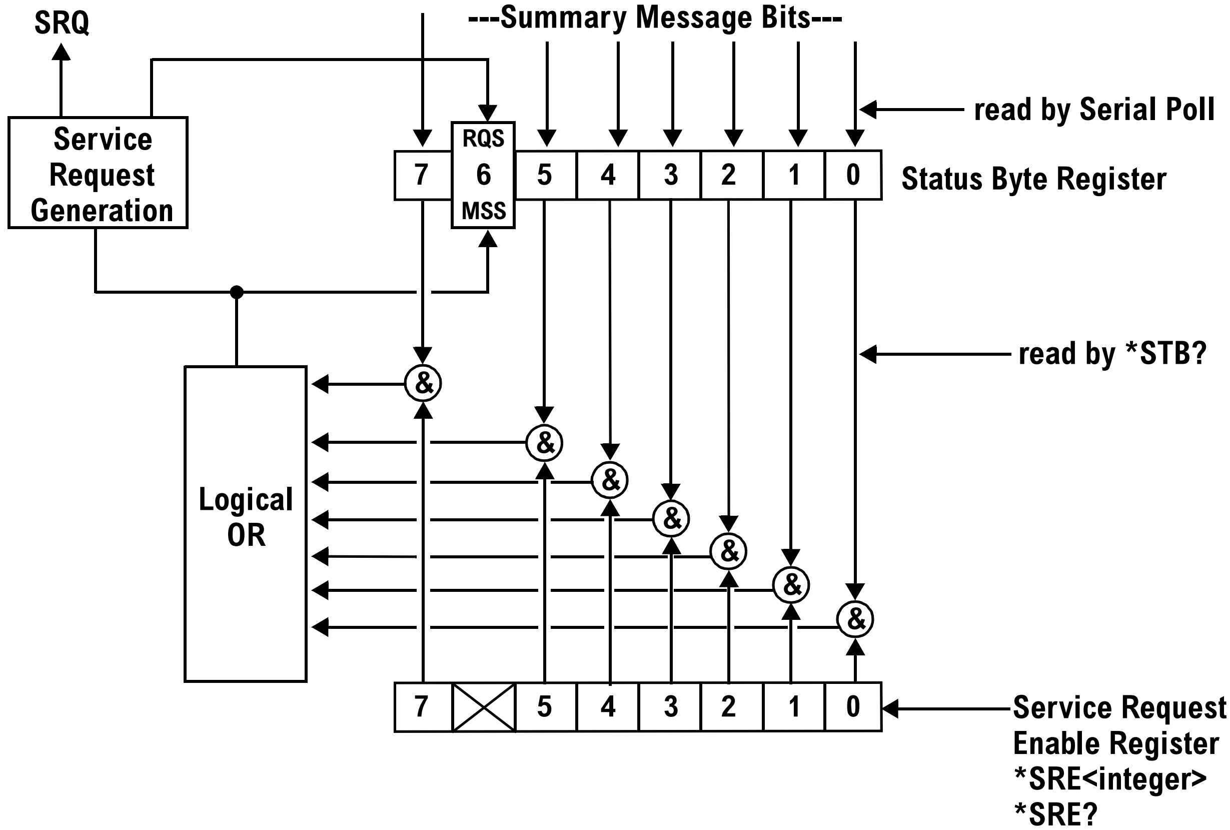
Summary Message Bit

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 Bye 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 is 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 Description” on page 301

“Standard Event Status Register” on page 333

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 nr1 data type.

```
OUTPUT 714;"CALL:SET:PDTCH?;PDTCH:BAND?;CSCH?;MS:TXL:BURS?;BURS2?"
```

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

+30;"PGSM";"CS4";+15;+15

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

```
ENTER 714;Pdtch,Band$,Cscheme$,Burst1_lev,Burst2_lev
```

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:

```
10 DIM Responses$[500]
20 OUTPUT 714;”CALL:SET:PDTCH?;PDTCH:BAND?;CSCH?;MS:TXL:BURS?;BURS2?”
30 ENTER 714;Response$
40 Semicolon=POS(Response$,”;”)
50 WHILE Semicolon
60 Response$[Semicolon,Semicolon]=CHR$(10)
70 Semicolon=POS(Response$,”;”)
80 END WHILE
90 ENTER Response$;Pdtch,Band$,Cscheme$,Burst1_lev,Burst2_lev
```

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;”CALL:DATA:PING:PLOS?;TIME?”
ENTER 714;Plost,Avg_time
```

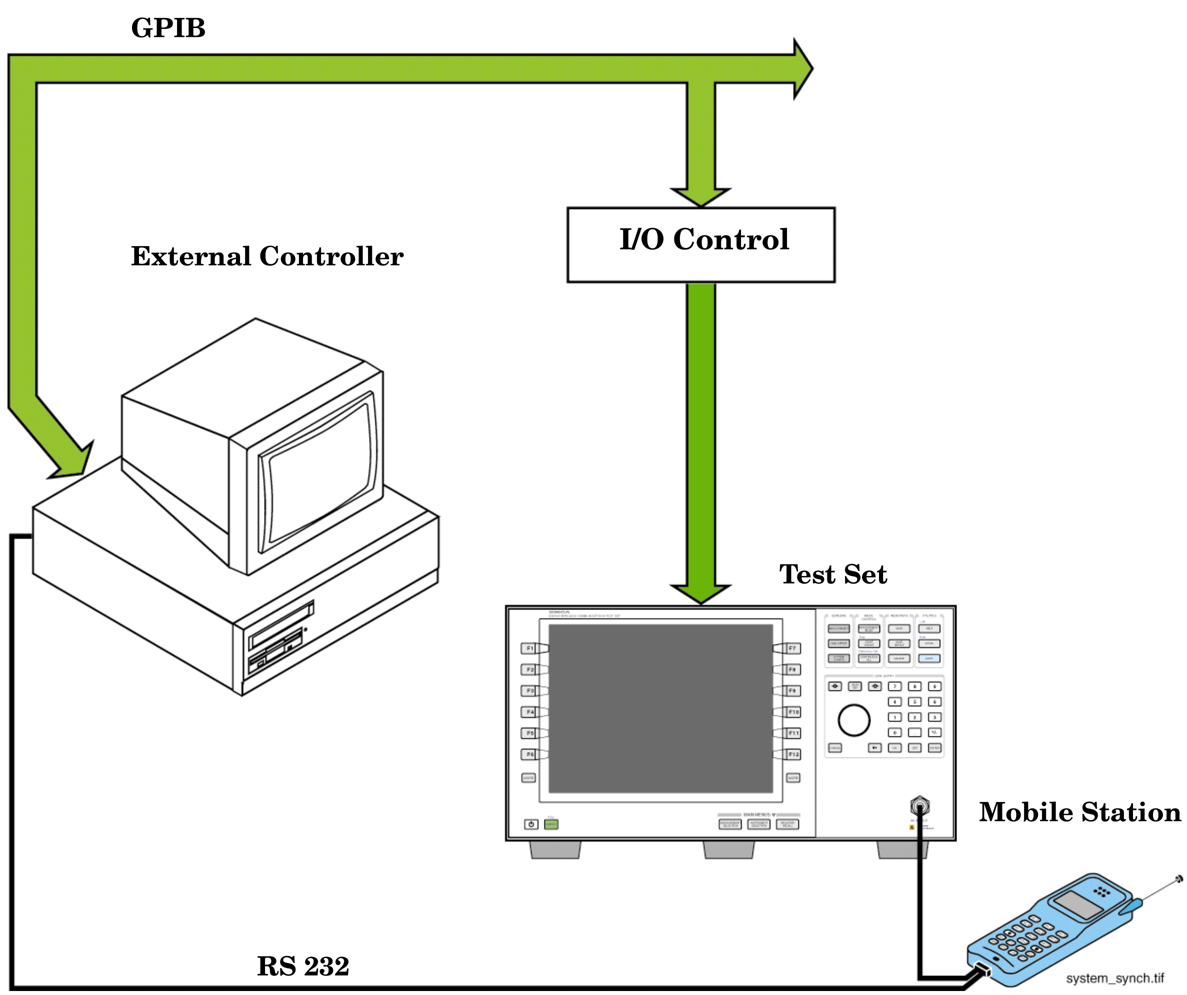
Test System Synchronization Overview

Description

Typical test systems include an external controller with a GPIB connection to the test set, an RF 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 6. 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 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[:STATe]:DATA?" on page 280
  This command queries the test set's current GPRS data connection processing state. This command supports synchronization method five. See "Data Connection Processing State Query" on page 155.
- "CALL:ATTached[:STATe]?" on page 163
  This command determines if the current data connection is in the attached state. This command supports synchronization method 5.
- "CALL:TRANsferring[:STATe]?" on page 283
  This command determines if the current data connection is in the transferring state. This command supports synchronization method 5.
- :DONE? and :OPC?
  These specialized commands can be appended to GPRS data connection processing overlapped commands to support synchronization method three. See "Call Processing Subsystem Overlapped Commands" on page 153.
- :WAIT
  This specialized command can be appended to GPRS data connection processing overlapped commands to support synchronization method two.
  See "Call Processing Subsystem Overlapped Commands" on page 153.

- :SEQ
  This specialized command can be appended to GPRS data connection processing overlapped commands to support synchronization method one.
  See “Call Processing Subsystem Overlapped Commands” on page 153.
- “SYSTem:SYNChronized” on page 371
  This specialized command causes a condition bit to be set then cleared when all prior sequential commands have completed and all prior overlapped commands have started indicating that the input buffer is synchronized. (See “STATus:OPERation Condition Register Bit Assignment” on page 306). This command supports synchronization method four and six.
- “*OPC” on page 336, “*OPC?” on page 336, and “*WAI” on page 337 (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 you use the other commands above instead.

Related Topics

“Data Connection Processing State Synchronization” on page 155

“Data Connection Processing Event Synchronization” on page 153

“SYSTem:SYNChronized” on page 371

Data Connection Processing Event Synchronization

Description

Using the call processing subsystem overlapped commands for synchronization, 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.

Call Processing Subsystem Overlapped Commands

Table 8. Overlapped Commands for Synchronization

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.	`OUTPUT 714;"CALL:DCON:ARM:DONE?"` This example queries whether the data connection state change detector has been successfully armed.
:SEQuential	Forces an overlapped command to execute in a sequential manner. No subsequent commands are executed until the pending operation flag for this operation is false.	`OUTPUT 714;"CALL:FUNC:DATA:STAR:SEQ"` This example commands the test set to start a data connection. A data connection must be established before any GPRS measurements can be made. :SEQ ensures that no other commands are executed until the pending operation flag associated with the CALL:FUNCtion:DATA:STARt command is false.
:WAIT	Forces the test set to wait until the associated command's pending operation flag is false before executing any more commands.	`OUTPUT 714;"CALL:DCON:ARM:WAIT?"` This example prevents the test set from executing the next command until the data connection state change detector has been armed.
: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.	`OUTPUT 714;"CALL:FUNC:DATA:STAR:OPC?"` This example hangs program execution until the :OPC query's until a 1 is placed in the test set's output queue.

Data Connection Processing Subsystem Overlapped Commands

Data Connection Processing Command	Purpose Of Command	Pending Operation Flag (POF) is false when
CALL:FUNCtion:DATA:STARt See “CALL:FUNCtion:DATA:STARt” on page 210.	Attempts to start the data connection.	The connection status is any non-transitory state (that is Idle, Attached or Transferring).
CALL:DCONnected:ARM[:IMMediate] See “CALL:DCONnected:ARM[:IMMediate]” on page 203.	Arms the data connection state change detector.	The data connection state change detector has been disarmed.

Related Topics

“Data Connection Processing State Synchronization” on page 155

“Test System Synchronization Overview” on page 150

Data Connection Processing State Synchronization

Description

Data Connection Processing State Query

The CALL:STATus[:STATe]:DATA? query returns a string indicating the current data connection processing state.

There are seven possible data connection processing states.

The query returns one of the following strings:

- "IDLE"

  Idle is returned when the mobile station is not GPRS attached.

- "ATTG"

  Attaching is returned when the mobile station has sent an attach request. This is a transitory state (which means that the mobile station can only remain in this state until the protocol timer expires). At the end of the signalling exchange, the new state will either be Attached or Idle, depending on whether or not the attach procedure completes without error.

- "DET"

  Detaching is returned when the attached mobile station has sent a detach request. This is a transitory state (which means that the mobile station can only remain in this state until it successfully moves to another state, or the protocol timer expires). At the end of the signalling exchange, the new state will be Idle, even if the procedure encounters an error.

- "ATT"

  Attached is returned when the mobile station has performed a successful GPRS attach.

- "STAR"

  Starting is returned when you have performed the "Start Data Connection" action (using "CALL:FUNCtion:DATA:STARt" on page 210). This is a transitory state (which means that the mobile station can only remain in this state until it successfully moves to another state, or the protocol timer expires). At the end of the signalling exchange, the new state will be either Transferring, Attached or Idle, depending on whether or not the data connection is successfully established.

- "END"

  Ending is returned when you have performed the "End Data Connection" action (using "CALL:FUNCtion:DATA:STOP" on page 210). This is a transitory state (which means that the mobile station can only remain in this state until it successfully moves to another state, or the protocol timer expires). At the end of the signalling exchange, the new state will be Attached, even if the procedure encounters an error.

- "TRAN"

  Transferring is returned when a data connection has been established.

Data Connection Processing State Synchronization

The following command returns the current state of a data connection:

```
OUTPUT 714;"CALL:STATus:STATe:DATA?"
ENTER 714;Inst_state$
```

Attached State Query This query determines if a data connection is in the Attached state by returning an integer value. The value indicates if the data connection state is Attached or any other non-transitory state, not if any data connection state change has occurred.

The query returns one of the following:

- 0 = Any non-transitory state other than Attached (that is, Idle or Transferring)
- 1 = Attached

If the data connection is in the Attaching, Detaching, Starting, or Ending state, this command does not return a value until the data connection state proceeds to Idle, Attached, or Transferring.

```
OUTPUT 714;"CALL:ATTached:STATe?"
```

Transferring State Query This query determines if a data connection is in the Transferring state by returning an integer value. The value indicates if the data connection state is Transferring or any other non-transitory state, not if any data connection state change has occurred.

The query returns one of the following:

- 0 = Any non-transitory state other than Transferring (that is, Idle or Attached)
- 1 = Transferring

If the data connection is in the Attaching, Detaching, Starting, or Ending state, this command will not return a value until the data connection state proceeds to Idle, Attached, or Transferring.

```
OUTPUT 714;"CALL:TRANsferring:STATe?"
```

Data Connection State Change Detector This method provides the advantage of indicating that a data connection state change has occurred. The change detector works in conjunction with the Attached State and Transferring State queries. Arming the CALL:DCONnected? query provides a way for the external controller to know when the data connection state change process is done.

The data connection state change detector becomes *disarmed* when any of the following conditions have been met:

- the data connection processing state has changed to either Idle, Attached or Transferring from one of the transitory states

  or,

- the attempt to establish a data connection failed and one of the test set's Fixed Timers has timed out

  or,

- no data connection processing state changes occurred within the time period specified by the timeout timer.

The following command arms the data connection state change detector, but does not cause any data connection processing function to start:

```
OUTPUT 714;"CALL:DCONnected:ARM[:IMMEDIATE]"
```

Data Connection State Change Detector Timeout

If a state change does not occur, you need a way to control how long to wait for the change detector. The change detector is disarmed by the timeout timer. After a timeout, the state query that you have initiated (Attached state query or Transferring state query will return a 1 for connected or a 0 for idle. You can set the timeout value using "CALL:DCONnected:TIMeout" on page 204.

Related Topics

"Test System Synchronization Overview" on page 150

"Data Connection Processing Event Synchronization" on page 153

"CALL:STATus[:STATe]:DATA?" on page 280

4 GPIB Syntax

Diagram Conventions

Description

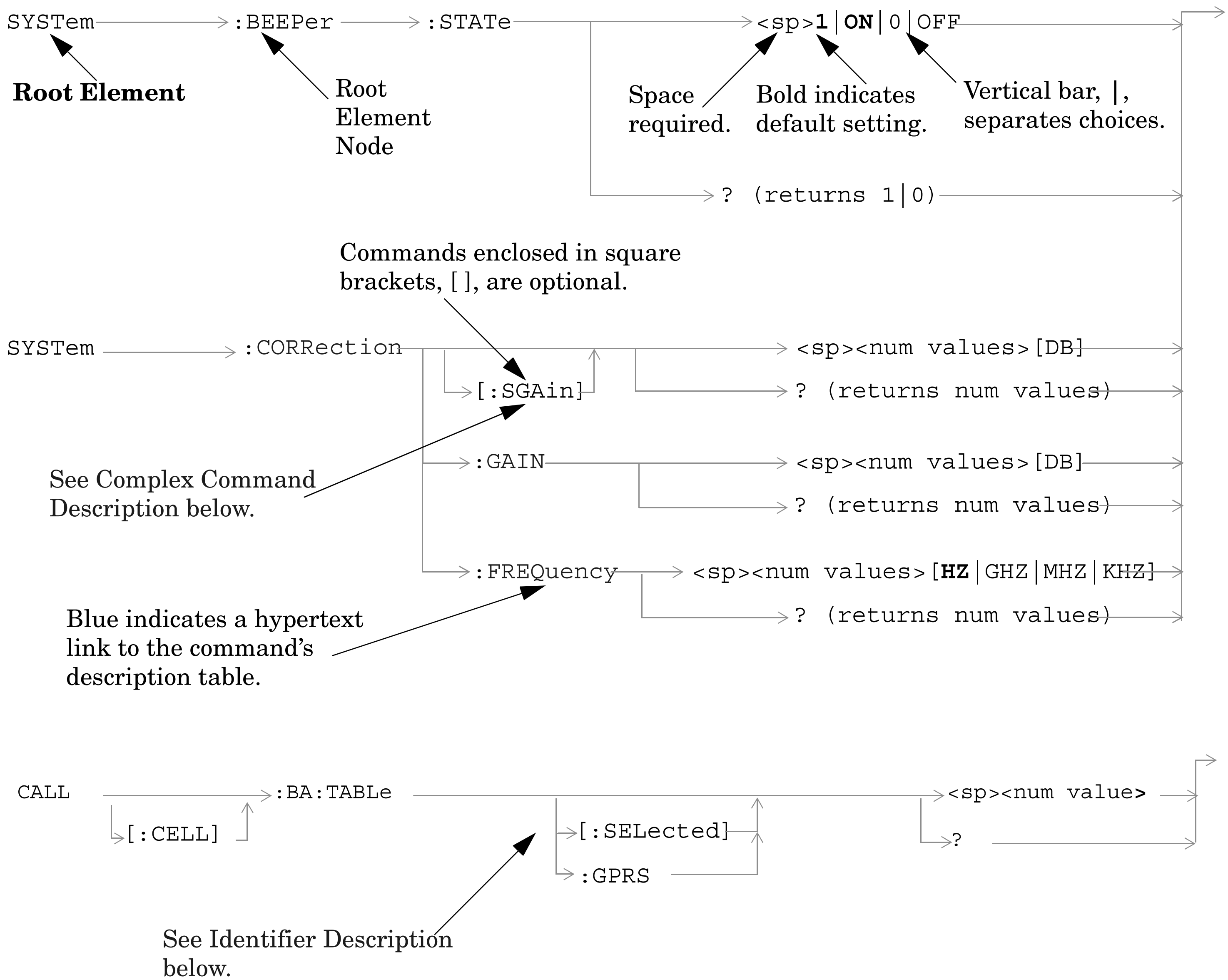


Diagram Description

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 protocal 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 protocal 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-Setting

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

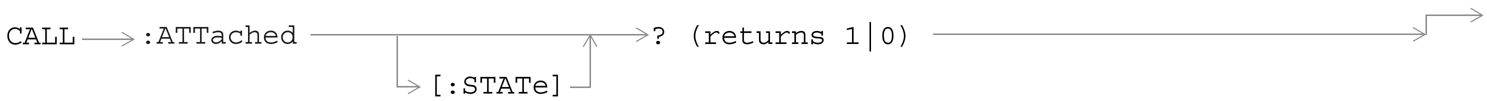
CALL Subsystem

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:ATTached

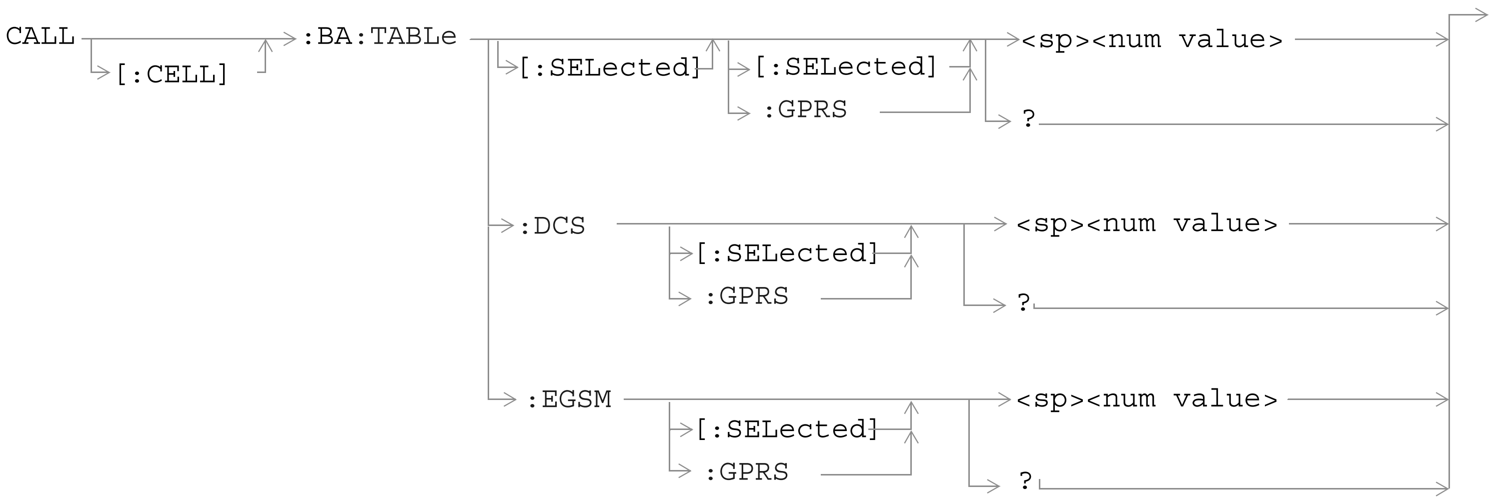


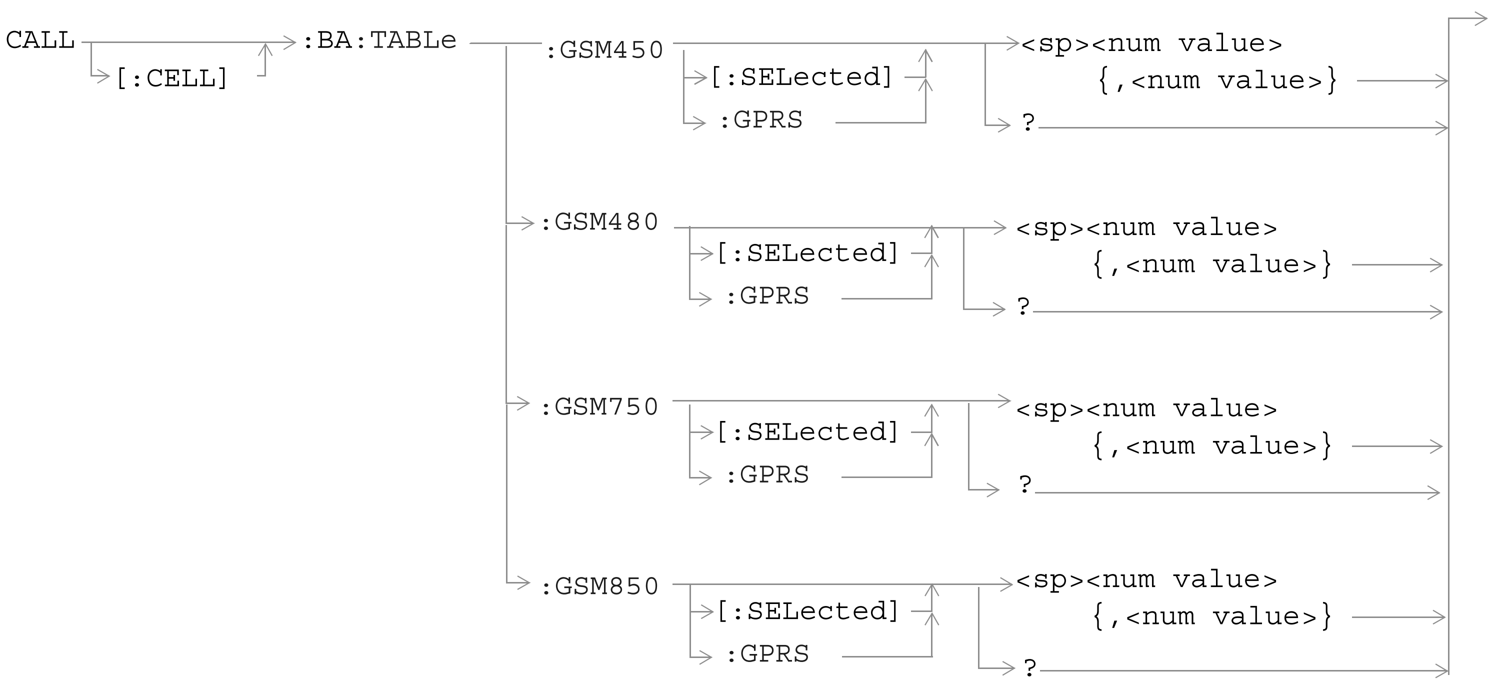
“Diagram Conventions” on page 160

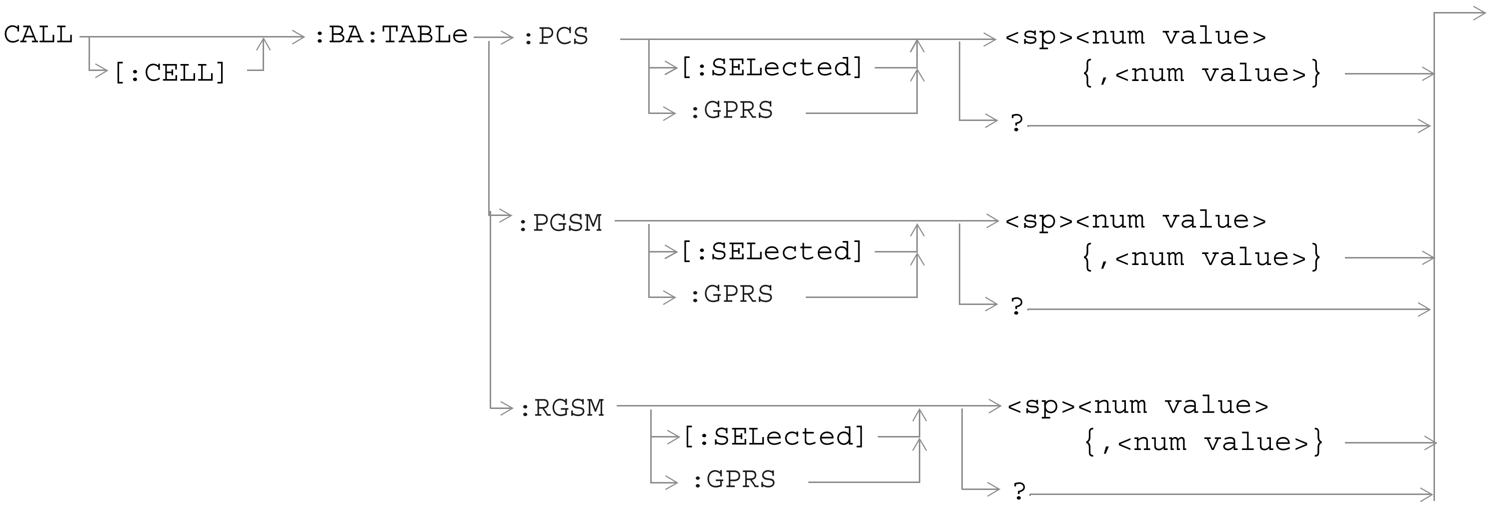
CALL:ATTached[:STATe]?

Function	Queries whether or not the data connection is in the attached state. 1 is returned if the data connection is in the attached state. 0 is returned if the data connection is in any other non-transitory state. For more details on the Attached State query or the data connection states, see “Data Connection Processing State Synchronization” on page 155.
Query	Range: 0 | 1
*RST Setting	0 | OFF
Programming Example `OUTPUT 714;"CALL:ATTached:STATe?"`	

CALL:BA


CALL
[:CELL]
:BA:TABLe
[:SELected]
[:SELected]
:GPRS
<sp><num value>
?
:DCS
[:SELected]
:GPRS
<sp><num value>
?
:EGSM
[:SELected]
:GPRS
<sp><num value>
?


CALL
[:CELL]
:BA:TABLe
:GSM450
[:SELected]
:GPRS
<sp><num value>
{,<num value>}
?
:GSM480
[:SELected]
:GPRS
<sp><num value>
{,<num value>}
?
:GSM750
[:SELected]
:GPRS
<sp><num value>
{,<num value>}
?
:GSM850
[:SELected]
:GPRS
<sp><num value>
{,<num value>}
?



“Diagram Conventions” on page 160

CALL[:CELL]:BA:TABLe[:SELected][:SELected]

Function	This command sets/queries the BA table entry for the selected broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in the setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns 9.91E+37 (NAN).
Setting	Depends upon the selected broadcast band. Range: • DCS, EGSM, GSM450, GSM480, GSM750, GSM850, PGSM and RGSM broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • PCS broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 Resolution: 1 Default setting: • DCS BA Table: 512, 698, 885, 537, 562, 587, 612, 637, 662, 712, 737, 762, 787, 812, 837, 862 • EGSM BA Table: 20, 975, 37, 124, 986, 1008, 1019, 7, 18, 30, 53, 64, 76, 87, 99, 110 • GSM450 BA Table: 270, 259, 276, 293, 262, 264, 267, 269, 272, 275, 277, 280, 282, 285, 287, 290 • GSM480 BA Table: 310, 306, 323, 340, 309, 311, 314, 316, 319, 321, 324, 327, 329, 332, 334, 337 • GSM750 BA Table: 450, 438, 474, 511, 444, 449, 454, 459, 465, 470, 476, 481, 487, 493, 499, 505 • GSM850 BA Table: 150, 128, 190, 251, 138, 148, 158, 168, 178, 188, 198, 208, 218, 228,238, 248 • PCS BA Table: 512, 660, 810, 530, 550, 570, 590, 610, 630, 650, 690, 710, 730, 750, 770, 790 • PGSM BA Table: 20, 1, 62, 124, 9, 18, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117 • RGSM BA Table: 20, 955, 28, 124, 969, 984, 999, 1014, 5, 21, 35, 50, 65, 80, 95, 110 states: first entry = ON, all others = OFF
Query	Range: • DCS, EGSM, GSM450, GSM480, GSM750, GSM850, PGSM and RGSM broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • PCS broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	PGSM BA Table: 20, 1, 62, 124, 9, 18, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117 states: First entry = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:SELECTED 512,689,885" !Sets 3 table entries for the
                                                      !selected broadcast band.
                                                      !States of the remaining 13
                                                      !entries are set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:SELECTED" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe[:SELected]:GPRS

Function	This command sets/queries the BA Table entries for the selected broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns 9.91E+37 (NAN).
Setting	Depends upon the selected broadcast band. Range: • DCS, EGSM, GSM450, GSM480, GSM750, GSM850, PGSM and RGSM broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • PCS broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 Resolution: 1 Default setting: • DCS BA Table: 512, 698, 885, 537, 562, 587, 612, 637, 662, 712, 737, 762, 787, 812, 837, 862 • EGSM BA Table: 20, 975, 37, 124, 986, 1008, 1019, 7, 18, 30, 53, 64, 76, 87, 99, 110 • GSM450 BA Table: 270, 259, 276, 293, 262, 264, 267, 269, 272, 275, 277, 280, 282, 285, 287, 290 • GSM480 BA Table: 310, 306, 323, 340, 309, 311, 314, 316, 319, 321, 324, 327, 329, 332, 334, 337 • GSM750 BA Table: 450, 438, 474, 511, 444, 449, 454, 459, 465, 470, 476, 481, 487, 493, 499, 505 • GSM850 BA Table: 150, 128, 190, 251, 138, 148, 158, 168, 178, 188, 198, 208, 218, 228,238, 248 • PCS BA Table: 512, 660, 810, 530, 550, 570, 590, 610, 630, 650, 690, 710, 730, 750, 770, 790 • PGSM BA Table: 20, 1, 62, 124, 9, 18, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117 • RGSM BA Table: 20, 955, 28, 124, 969, 984, 999, 1014, 5, 21, 35, 50, 65, 80, 95, 110 states: first entry = ON, all others = OFF
Query	Range: • DCS, EGSM, GSM450, GSM480, GSM750, GSM850, PGSM and RGSM broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • PCS broadcast band range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	PGSM BA Table: 20, 1, 62, 124, 9, 18, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117 states: First entry = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:SELECTED:GPRS 512,689,885" !Sets 3 table entries for the
                                                          !selected broadcast band.
                                                          !States of the remaining 13
                                                          !entries are set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:SELECTED:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:DCS[:SELected]

Function	This command sets/queries the BA Table entries for the DCS broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 512, 698, 885, 537, 562, 587, 612, 637, 662, 712, 737, 762, 787, 812, 837, 862 states: 512 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:DCS 512,612,787" !Sets three BA table entries for
                                                !the DCS broadcast band. States
                                                !of the remaining 13 entries are
                                                !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:DCS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:DCS:GPRS

Function	This command sets/queries the BA Table entries for the DCS broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 512, 698, 885, 537, 562, 587, 612, 637, 662, 712, 737, 762, 787, 812, 837, 862 states: 512 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:DCS:GPRS 512,612,787" !Sets three BA table entries for
                                                     !the DCS broadcast band. States
                                                     !of the remaining 13 entries are
                                                     !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:DCS:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:EGSM[:SELected]

Function	This command sets/queries the BA Table entries for the EGSM broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 20, 975, 37, 124, 986, 1008, 1019, 7, 18, 30, 53, 64, 76, 87, 99, 110 states: 20 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:EGSM 120,975,1012"  !Sets three BA table entries for
                                                   !the EGSM broadcast band. States
                                                   !of the remaining 13 entries are
                                                   !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:EGSM" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:EGSM:GPRS

Function	This command sets/queries the BA Table entries for the EGSM broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 20, 975, 37, 124, 986, 1008, 1019, 7, 18, 30, 53, 64, 76, 87, 99, 110 states: 20 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:EGSM:GPRS 120,975,1012"  !Sets three BA table entries for
                                                        !the EGSM broadcast band. States
                                                        !of the remaining 13 entries are
                                                        !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:EGSM:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM450[:SELected]

Function	This command sets/queries the BA Table entries for the GSM450 broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 270, 259, 276, 293, 262, 264, 267, 269, 272, 275, 277, 280, 282, 285, 287, 290 states: 270 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM450 120,975,1012"  !Sets three BA table entries for
                                                     !the GSM450 broadcast band. States
                                                     !of the remaining 13 entries are
                                                     !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM450" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM450:GPRS

Function	This command sets/queries the BA Table entries for the GSM450 broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 270, 259, 276, 293, 262, 264, 267, 269, 272, 275, 277, 280, 282, 285, 287, 290 states: 270 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM450:GPRS 120,975,1012"  !Sets three BA table entries for
                                                          !the GSM450 broadcast band. States
                                                          !of the remaining 13 entries are
                                                          !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM450:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM480[:SELected]

Function	This command sets/queries the BA Table entries for the GSM480 broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 310, 306, 323, 340, 309, 311, 314, 316, 319, 321, 324, 327, 329, 332, 334, 337 states: 310 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM480 120,975,1012" !Sets three BA table entries for
                                                    !the GSM480 broadcast band. States
                                                    !of the remaining 13 entries are
                                                    !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM480" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM480:GPRS

Function	This command sets/queries the BA Table entries for the GSM480 broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 310, 306, 323, 340, 309, 311, 314, 316, 319, 321, 324, 327, 329, 332, 334, 337 states: 310 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM480:GPRS 120,975,1012" !Sets three BA table entries for
                                                         !the GSM480 broadcast band. States
                                                         !of the remaining 13 entries are
                                                         !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM480:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM750[:SELected]

Function	This command sets/queries the BA Table entries for the GSM750 broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 450, 438, 474, 511, 444, 449, 454, 459, 465, 470, 476, 481, 487, 493, 499, 505 states: 450 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM750 120,975,1012" !Sets three BA table entries for
                                                    !the GSM750 broadcast band. States
                                                    !of the remaining 13 entries are
                                                    !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM750" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM750:GPRS

Function	This command sets/queries the BA Table entries for the GSM750 broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 450, 438, 474, 511, 444, 449, 454, 459, 465, 470, 476, 481, 487, 493, 499, 505 states: 450 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM750:GPRS 120,975,1012" !Sets three BA table entries for
                                                         !the GSM750 broadcast band. States
                                                         !of the remaining 13 entries are
                                                         !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM750:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM850[:SELected]

Function	This command sets/queries the BA Table entries for the GSM850 broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124|128 to 251|259 to 293|306 to 340|438 to 511|512 to 885|955 to 1023 Resolution: 1
Query	Range: • 0 to 124|128 to 251|259 to 293|306 to 340|438 to 511|512 to 885|955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 150, 128, 190, 251, 138, 148, 158, 168, 178, 188, 198, 208, 218, 228, 238, 248 states: 150 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM850 130,190,249" !Sets three BA table entries for
                                                   !the GSM850 broadcast band. States
                                                   !of the remaining 13 entries are
                                                   !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM850" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:GSM850:GPRS

Function	This command sets/queries the BA Table entries for the GSM850 broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124|128 to 251|259 to 293|306 to 340|438 to 511|512 to 885|955 to 1023 Resolution: 1
Query	Range: • 0 to 124|128 to 251|259 to 293|306 to 340|438 to 511|512 to 885|955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 150, 128, 190, 251, 138, 148, 158, 168, 178, 188, 198, 208, 218, 228, 238, 248 states: 150 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM850:GPRS 130,190,249" !Sets three BA table entries for
                                                        !the GSM850 broadcast band. States
                                                        !of the remaining 13 entries are
                                                        !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:GSM850:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:PCS[:SELected]

Function	This command sets/queries the BA Table entries for the PCS broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 512, 660, 810, 530, 550, 570, 590, 610, 630, 650, 690, 710, 730, 750, 770, 790 states: 512 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:PCS 660,710,790" !Sets three BA table entries for
                                                !the PCS broadcast band. States
                                                !of the remaining 13 entries are
                                                !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:PCS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:PCS:GPRS

Function	This command sets/queries the BA Table entries for the PCS broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 810 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 512, 660, 810, 530, 550, 570, 590, 610, 630, 650, 690, 710, 730, 750, 770, 790 states: 512 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:PCS:GPRS 660,710,790" !Sets three BA table entries for
                                                     !the PCS broadcast band. States
                                                     !of the remaining 13 entries are
                                                     !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:PCS:GPRS" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:PGSM[:SELected]

Function	This command sets/queries the BA Table entries for the PGSM broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 20, 1, 62, 124, 9, 18, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117 states: 20 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:PGSM 20,36,120" !Sets three BA Table entries for
                                               !the PGSM broadcast band. States
                                               !of the remaining 13 entries are
                                               !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:PGSM" !Sets states of all BA Table entries to OFF.
```

CALL[:CELL]:BA:TABLe:PGSM:GPRS

Function	This command sets/queries the BA Table entries for the PGSM broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 511 | 512 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 20, 1, 62, 124, 9, 18, 36, 45, 54, 63, 72, 81, 90, 99, 108, 117 states: 20 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:PGSM:GPRS 20,36,120" !Sets three BA Table entries for
                                                    !the PGSM broadcast band. States
                                                    !of the remaining 13 entries are
                                                    !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:PGSM:GPRS" !Sets states of all BA Table entries to OFF.
```

CALL[:CELL]:BA:TABLe:RGSM[:SELected]

Function	This command sets/queries the BA Table entries for the RGSM broadcast band in the active (that is the selected) format. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 20, 955, 28, 124, 969, 984, 999, 1014, 5, 21, 35, 50, 65, 80, 95, 110 states: 20 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:RGSM 120,975,1012" !Sets three BA table entries for
                                                  !the RGSM broadcast band. States
                                                  !of the remaining 13 entries are
                                                  !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:RGSM" !Sets states of all table entries to OFF.
```

CALL[:CELL]:BA:TABLe:RGSM:GPRS

Function	This command sets/queries the BA Table entries for the RGSM broadcast band in the GPRS format whether or not that format is active. Entries are set (value entered into table and state set to ON) using a comma separated list of 1 to 16 values. States of table entries not included in setting list are set to OFF. Sending a null list (no values) sets states of all table entries to OFF. Query returns a comma separated list of the table entries that are in the ON state. If states of all table entries are set to OFF, query returns NAN (9.91E+37).
Setting	Range: 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 885 | 955 to 1023 Resolution: 1
Query	Range: • 0 to 124 | 128 to 251 | 259 to 293 | 306 to 340 | 438 to 885 | 955 to 1023 • 9.91E+37 (NAN)
*RST Setting	entries: 20, 955, 28, 124, 969, 984, 999, 1014, 5, 21, 35, 50, 65, 80, 95, 110 states: 20 = ON, all others = OFF

Programming Example

```
OUTPUT 714;"CALL:CELL:BA:TABLE:RGSM:GPRS 120,975,1012" !Sets three BA table entries for
                                                       !the RGSM broadcast band. States
                                                       !of the remaining 13 entries are
                                                       !set to OFF.
OUTPUT 714;"CALL:CELL:BA:TABLE:RGSM:GPRS" !Sets states of all table entries to OFF.
```

CALL:BAND

```
CALL ──────────────→ :BAND ──────────────────→ <sp>DCS|EGSM|GSM450|GSM480|GSM750|
  └→ [:CELL] ─┘           ├→ [:SELected] ─┤      GSM850|PCS|PGSM|RGSM
                          └→ :GPRS ───────┘    ?  (returns DCS|EGSM|GSM450|GSM480|
                                                  GSM750|GSM850|PCS|PGSM|RGSM
```

“Diagram Conventions” on page 160

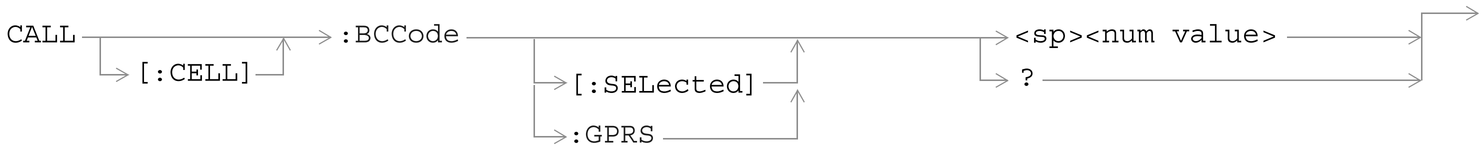
CALL[:CELL]:BAND[:SELected]

Function	This command sets/queries the band in which the broadcast channel (BCH) is transmitted.
Setting	Range: PGSM | DCS | EGSM | GSM450 | GSM480 | GSM750 | GSM850 | PCS | RGSM
Query	Range: PGSM | DCS | EGSM | GSM450 | GSM480 | GSM750 | GSM850 | PCS | RGSM
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.
Related Topics	See “Cell Band Parameter” on page 111
Programming Example `OUTPUT 714;”CALL:CELL:BAND PGSM” !Sets the band for the BCH to PGSM.`	

CALL[:CELL]:BAND:GPRS

Function	This command sets/queries the band in which the broadcast channel (BCH) is transmitted in the GPRS format whether or not that format is active.
Setting	Range: PGSM | DCS | EGSM | GSM450 | GSM480 | GSM750 | GSM850 | PCS | RGSM
Query	Range: PGSM | DCS | EGSM | GSM450 | GSM480 | GSM750 | GSM850 | PCS | RGSM
*RST Setting	PGSM
Related Topics	See “Cell Band Parameter” on page 111
Programming Example `OUTPUT 714;”CALL:CELL:BAND:GPRS PGSM” !Sets the band for the GPRS BCH to PGSM.`	

CALL:BCCode



“Diagram Conventions” on page 160

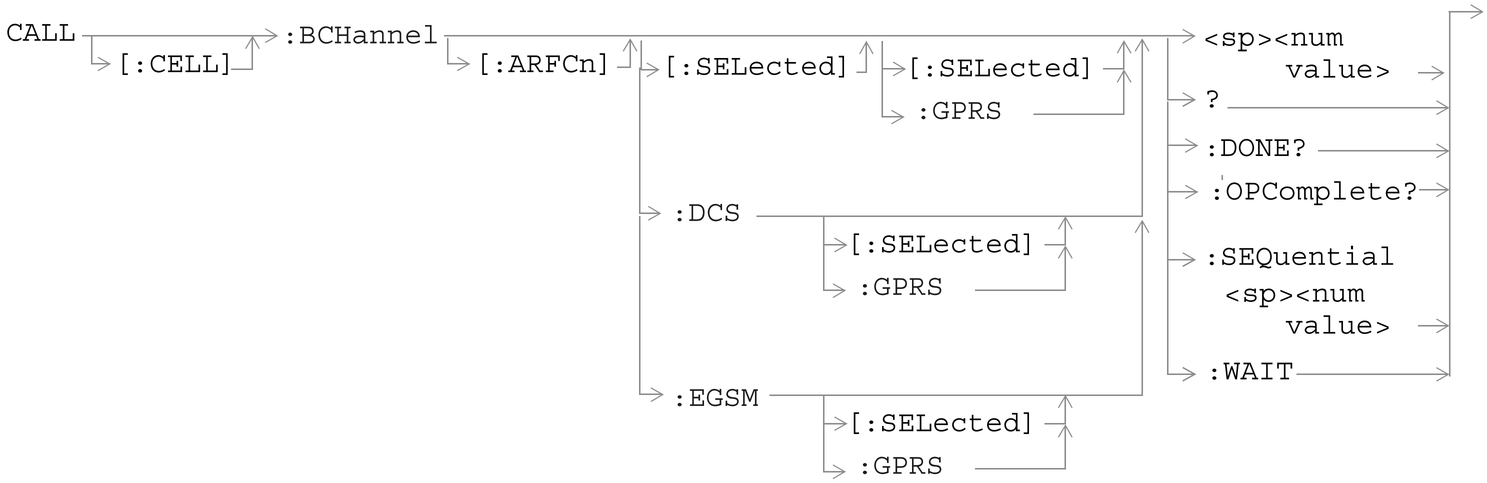
CALL[:CELL]:BCCode[:SELected]

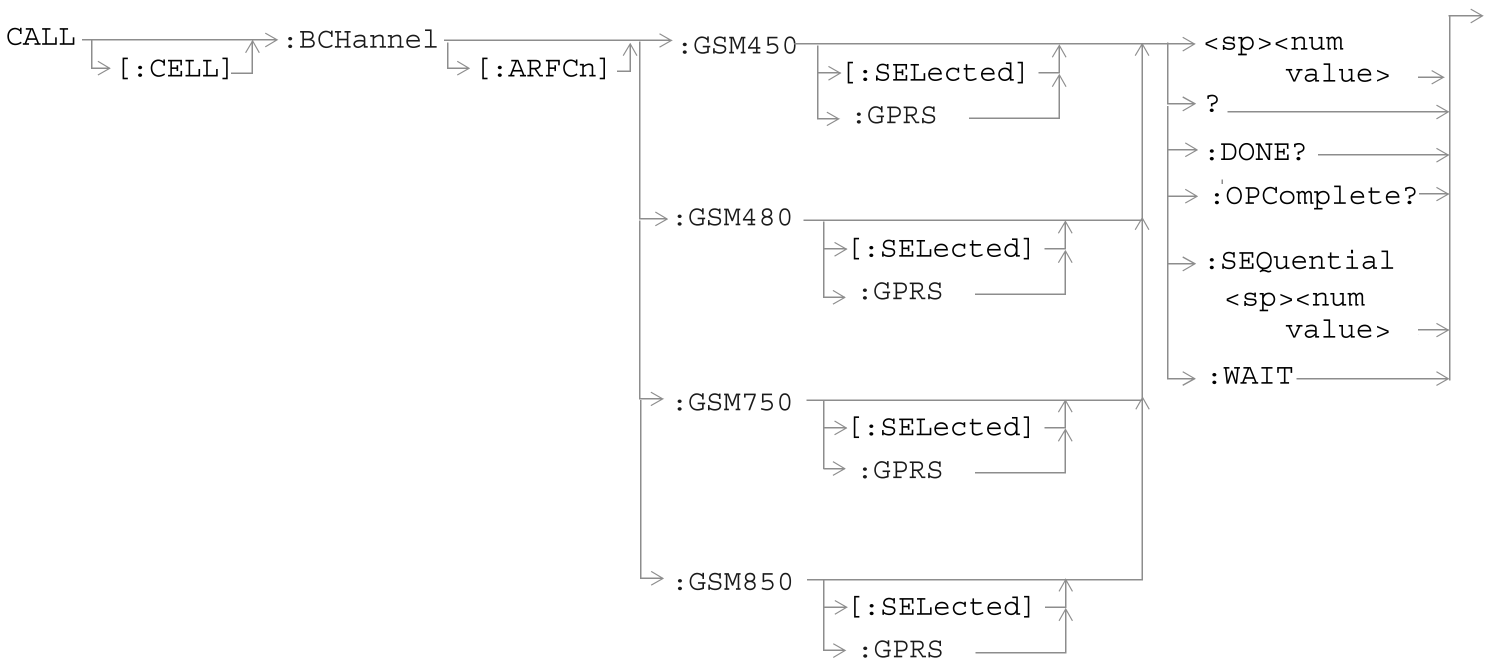
Function	Sets/queries the value of the Base Station Colour Code (BCC) for the active (that is the selected) format.
Setting	Range: 0 to 7 Resolution: 1
Query	Range: 0 to 7 Resolution: 1
*RST Setting	5
Related Topics	See “Configuring the Broadcast Channel (BCH)” on page 104.
Programming Example `OUTPUT 714;”CALL:CELL:BCCODE:SELECTED 4” !Sets the cell’s base station color code to 4.`	

CALL[:CELL]:BCCode:GPRS

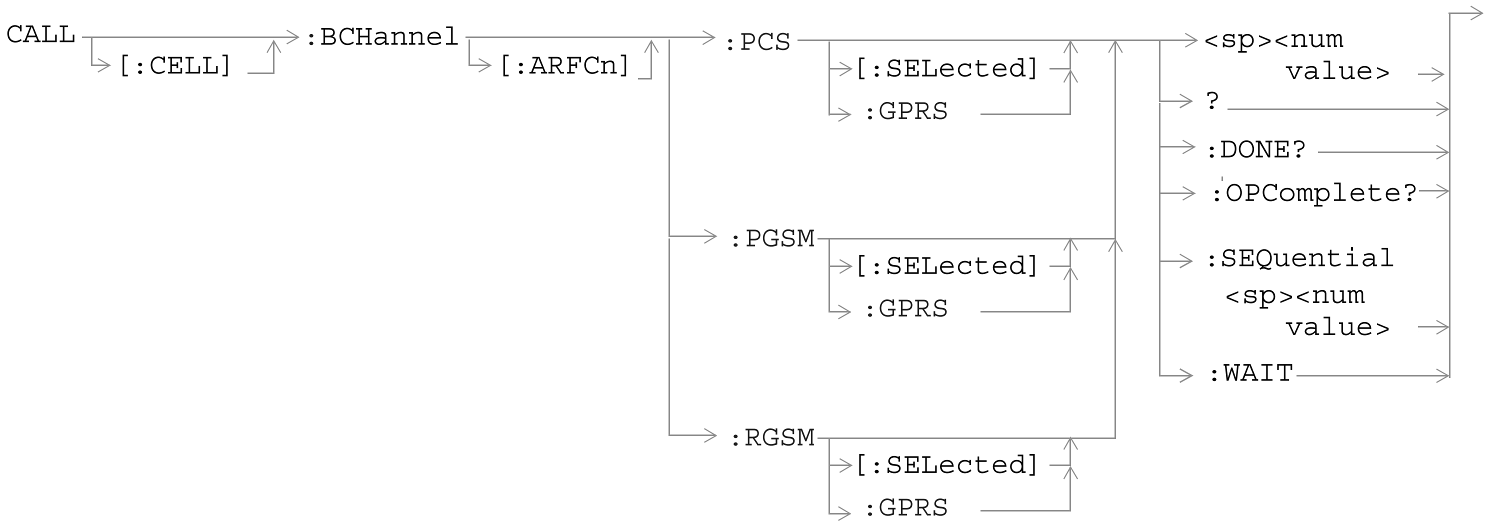
Function	Sets/queries the value of the Base Station Colour Code (BCC) for the GPRS format.
Setting	Range: 0 to 7 Resolution: 1
Query	Range: 0 to 7 Resolution: 1
*RST Setting	5
Related Topics	See “Configuring the Broadcast Channel (BCH)” on page 104.
Programming Example `OUTPUT 714;”CALL:CELL:BCCODE:GPRS 4” !Sets the cell’s base station color code to 4.`	

CALL:BCHannel





CALL:BCHannel



"Diagram Conventions" on page 160

CALL[:CELL]:BCHannel[:ARFCn][:SELected][:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the currently selected broadcast band in the active (that is the selected) format.
Setting	Depends upon the selected broadcast band. Range: • PGSM broadcast band range: 1 to 124 • EGSM broadcast band range: 0 to 124 | 975 to 1023 • GSM450 broadcast band range: 259 to 293 • GSM480 broadcast band range: 306 to 340 • GSM750 broadcast band range: 438 to 511 • GSM850 broadcast band range: 128 to 251 • DCS broadcast band range: 512 to 885 • PCS broadcast band range: 512 to 810 • RGSM broadcast band range: 0 to 124 | 955 to 1023 Resolution: 1
Query	Depends upon the selected broadcast band. Range: • PGSM broadcast band range: 1 to 124 • EGSM broadcast band range: 0 to 124 | 975 to 1023 • GSM450 broadcast band range: 259 to 293 • GSM480 broadcast band range: 306 to 340 • GSM750 broadcast band range: 438 to 511 • GSM850 broadcast band range: 128 to 251 • DCS broadcast band range: 512 to 885 • PCS broadcast band range: 512 to 810 • RGSM broadcast band range: 0 to 124 | 955 to 1023 Resolution: 1
*RST Setting	20
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104.

Programming Example

```
OUTPUT 714;”CALL:CELL:BCHANNEL:ARFCN:SELECTED 512” !Sets BCH ARFCN for the selected
                                                   !broadcast band to channel 512.
```

CALL[:CELL]:BCHannel[:ARFCn][:SELected]:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the currently selected broadcast band in the GPRS format whether or not that format is active.
Setting	Depends upon the selected broadcast band. Range: • PGSM broadcast band range: 1 to 124 • EGSM broadcast band range: 0 to 124 | 975 to 1023 • GSM450 broadcast band range: 259 to 293 • GSM480 broadcast band range: 306 to 340 • GSM750 broadcast band range: 438 to 511 • GSM850 broadcast band range: 128 to 251 • DCS broadcast band range: 512 to 885 • PCS broadcast band range: 512 to 810 • RGSM broadcast band range: 0 to 124 | 955 to 1023 Resolution: 1
Query	Depends upon the selected broadcast band. Range: • PGSM broadcast band range: 1 to 124 • EGSM broadcast band range: 0 to 124 | 975 to 1023 • GSM450 broadcast band range: 259 to 293 • GSM480 broadcast band range: 306 to 340 • GSM750 broadcast band range: 438 to 511 • GSM850 broadcast band range: 128 to 251 • DCS broadcast band range: 512 to 885 • PCS broadcast band range: 512 to 810 • RGSM broadcast band range: 0 to 124 | 955 to 1023 Resolution: 1
*RST Setting	20
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:SELECTED:GPRS 512" !Sets GPRS BCH ARFCN for the
                                                         !selected broadcast band
                                                         !to channel 512.
```

CALL[:CELL]:BCHannel[:ARFCn]:DCS[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the DCS broadcast band in the active (that is the selected) format.
Setting	Range: 512 to 885 Resolution: 1
Query	Range: 512 to 885 Resolution: 1
*RST Setting	512
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104.

Programming Example

```
OUTPUT 714;”CALL:CELL:BCHANNEL:ARFCN:DCS 810”  !Sets BCH ARFCN for DCS broadcast
                                               !band to 810.
```

CALL[:CELL]:BCHannel[:ARFCn]:DCS:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the DCS broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 512 to 885 Resolution: 1
Query	Range: 512 to 885 Resolution: 1
*RST Setting	512
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.
Programming Example	

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:DCS:GPRS 810" !Sets GPRS BCH ARFCN for DCS broadcast
                                                   !band to 810.
```

CALL[:CELL]:BCHannel[:ARFCn]:EGSM[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the EGSM broadcast band in the active (that is the selected) format.
Setting	Range: 0 to 124 | 975 to 1023 Resolution: 1
Query	Range: 0 to 124 | 975 to 1023 Resolution: 1
*RST Setting	20
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.
Programming Example	

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:EGSM 120" !Sets BCH ARFCN for EGSM broadcast
                                               !band to 120.
```

CALL[:CELL]:BCHannel[:ARFCn]:EGSM:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the EGSM broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 0 to 124 | 975 to 1023 Resolution: 1
Query	Range: 0 to 124 | 975 to 1023 Resolution: 1
*RST Setting	20
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:EGSM:GPRS 120" !Sets GPRS BCH ARFCN for EGSM broadcast
                                                    !band to 120.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM450[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the GSM450 broadcast band in the active (that is the selected) format.
Setting	Range: 259 to 293 Resolution: 1
Query	Range: 259 to 293 Resolution: 1
*RST Setting	270
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM450 263"  !Sets BCH ARFCN for GSM450 broadcast
                                                 !band to 263.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM450:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the GSM450 broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 259 to 293 Resolution: 1
Query	Range: 259 to 293 Resolution: 1
*RST Setting	270
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM450:GPRS 275"  !Sets GPRS BCH ARFCN for GSM450
                                                      !broadcast band to 275.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM480[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the GSM480 broadcast band in the active (that is the selected) format.
Setting	Range: 306 to 340 Resolution: 1
Query	Range: 306 to 340 Resolution: 1
*RST Setting	310
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM480 320" !Sets BCH ARFCN for GSM480 broadcast
                                                 !band to 320.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM480:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the GSM480 broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 306 to 340 Resolution: 1
Query	Range: 306 to 340 Resolution: 1
*RST Setting	310
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM480:GPRS 328" !Sets GPRS BCH ARFCN for GSM480
                                                      !broadcast band to 328.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM750[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the GSM750 broadcast band in the active (that is the selected) format.
Setting	Range: 438 to 511 Resolution: 1
Query	Range: 438 to 511 Resolution: 1
*RST Setting	450
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM750 460" !Sets BCH ARFCN for GSM750 broadcast
                                                 !band to 460.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM750:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the GSM750 broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 438 to 511 Resolution: 1
Query	Range: 438 to 511 Resolution: 1
*RST Setting	450
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM750:GPRS 490" !Sets GPRS BCH ARFCN for GSM750
                                                      !broadcast band to 490.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM850[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the GSM850 broadcast band in the active (that is the selected) format.
Setting	Range: 128 to 251 Resolution: 1
Query	Range: 128 to 251 Resolution: 1
*RST Setting	150
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM850 230"  !Sets BCH ARFCN for GSM850 broadcast
                                                  !band to 230.
```

CALL[:CELL]:BCHannel[:ARFCn]:GSM850:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the GSM850 broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 128 to 251 Resolution: 1
Query	Range: 128 to 251 Resolution: 1
*RST Setting	150
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:GSM850:GPRS 230"  !Sets GPRS BCH ARFCN for GSM850
                                                       !broadcast band to 230.
```

CALL[:CELL]:BCHannel[:ARFCn]:PCS[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the PCS broadcast band in the active (that is the selected) format.
Setting	Range: 512 to 810 Resolution: 1
Query	Range: 512 to 810 Resolution: 1
*RST Setting	512
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:PCS 800" !Sets BCH ARFCN for PCS broadcast
                                              !band to 800.
```

CALL[:CELL]:BCHannel[:ARFCn]:PCS:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the PCS broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 512 to 810 Resolution: 1
Query	Range: 512 to 810 Resolution: 1
*RST Setting	512
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.
Programming Example	

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:PCS:GPRS 800" !Sets GPRS BCH ARFCN for PCS broadcast
                                                   !band to 800.
```

CALL[:CELL]:BCHannel[:ARFCn]:PGSM[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the PGSM broadcast band in the active (that is the selected) format.
Setting	Range: 1 to 124 Resolution: 1
Query	Range: 1 to 124 Resolution: 1
*RST Setting	20
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.
Programming Example	

```
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:PGSM 113" !Sets BCH ARFCN for PGSM broadcast
                                               !band to 113.
```

CALL[:CELL]:BCHannel[:ARFCn]:PGSM:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the PGSM broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 1 to 124 Resolution: 1
Query	Range: 1 to 124 Resolution: 1
*RST Setting	20
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.

Programming Example
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:PGSM:GPRS 113" !Sets GPRS BCH ARFCN for PGSM broadcast !band to 113.

CALL[:CELL]:BCHannel[:ARFCn]:RGSM[:SELected]

Function	This command sets/queries the broadcast channel ARFCN for the RGSM broadcast band in the active (that is the selected) format.
Setting	Range: 0 to 124 | 955 to 1023 Resolution: 1
Query	Range: 0 to 124 | 955 to 1023 Resolution: 1
*RST Setting	20
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.
Programming Example	
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:RGSM 960" !Sets BCH ARFCN for RGSM broadcast !band to 960.	

CALL[:CELL]:BCHannel[:ARFCn]:RGSM:GPRS

Function	This command sets/queries the broadcast channel ARFCN for the RGSM broadcast band in the GPRS format whether or not that format is active.
Setting	Range: 0 to 124 | 955 to 1023 Resolution: 1
Query	Range: 0 to 124 | 955 to 1023 Resolution: 1
*RST Setting	20
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104.
Programming Example	
OUTPUT 714;"CALL:CELL:BCHANNEL:ARFCN:RGSM:GPRS 1000" !Sets GPRS BCH ARFCN for RGSM broadcast !band to 1000.	

CALL:BURSt

```
CALL ->:BURSt:TYPE ------------------->|<sp>TSC0|TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7 ->
                    |->[:SELected] ->|  |
                    |-> :GPRS -------|  |-> ? ---------------------------------------->
```

"Diagram Conventions" on page 160

CALL:BURSt:TYPE[:SELected]

Function	Sets/queries the Expected Burst parameter in the active (that is the selected) format. This parameter is used for measurement synchronization when the test set's operating mode is set to one of the test modes, see "CALL:OPERating:MODE" on page 221 (If it is not set, the test set may not synchronize to the input signal's midamble). For more details on this parameter, see "Expected Burst" on page 103.
Setting	Range: TSC0 | TSC1 | TSC2 | TSC3 | TSC4 | TSC5 | TSC6 | TSC7
Query	Range: TSC0 | TSC1 | TSC2 | TSC3 | TSC4 | TSC5 | TSC6 | TSC7
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.
Related Topics	"Test Mode Operating Modes" on page 102.

Programming Example

```
OUTPUT 714;"CALL:BURSt:TYPE TSC2" ! Sets the test set to expect Training Sequence Code 2
                                  !in the midamble burst.
```

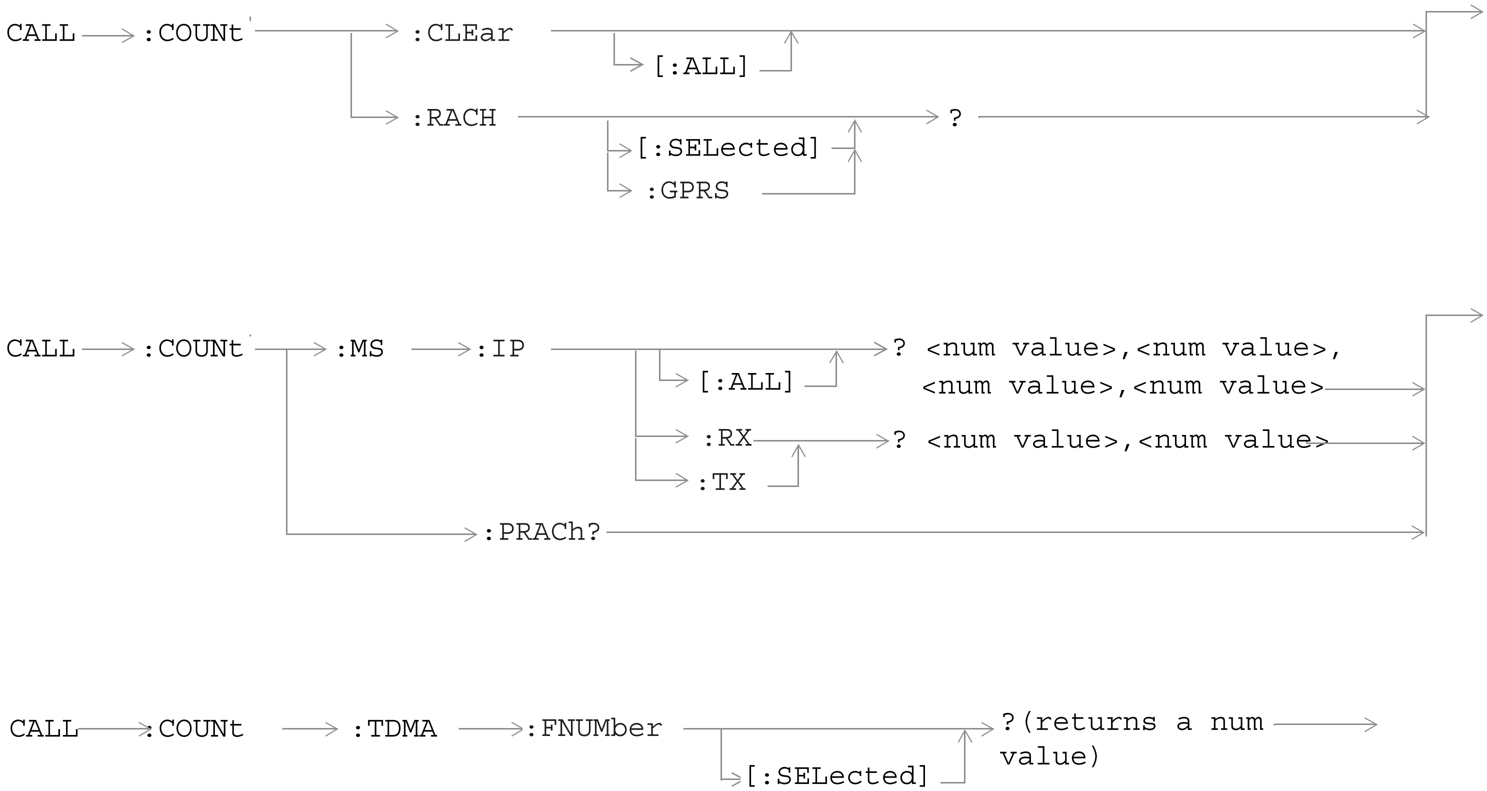
CALL:BURSt:TYPE:GPRS

Function	Sets/queries the Expected Burst parameter in the GPRS format whether or not that format is active. This parameter is used for measurement synchronization when the test set's operating mode is set to one of the test modes, see "CALL:OPERating:MODE" on page 221 (If it is not set, the test set may not synchronize to the input signal's midamble). For more details on this parameter, see "Expected Burst" on page 103.
Setting	Range: TSC0 | TSC1 | TSC2 | TSC3 | TSC4 | TSC5 | TSC6 | TSC7
Query	Range: TSC0 | TSC1 | TSC2 | TSC3 | TSC4 | TSC5 | TSC6 | TSC7
*RST Setting	TSC5
Related Topics	"Test Mode Operating Modes" on page 102.

Programming Example

```
OUTPUT 714;"CALL:BURSt:TYPE:GPRS TSC2" ! Sets the test set to expect Training Sequence Code
                                       !2 in the midamble burst.
```

CALL:COUNt



"Diagram Conventions" on page 160

CALL:COUNt:CLEar[:ALL]

Function	This command resets the RACH count result counter to zero. It also clears the reported results for the transmitted and received IP packets and bytes. The reported ping results are also cleared with this command.
Programming Example	
`OUTPUT 714;"CALL:COUNt:CLEar" !Clears the RACH count result counter.`	

CALL:COUNt:MS:IP[:ALL]?

Function	Queries the data transmitted from and received by the device being tested. Data is returned in the following order: packets transmitted, bytes transmitted, packets received, bytes received. The data connection type must be set to IPData. See "CALL:FUNCtion:DATA:TYPE" . If the data type is not IP Data, this query will return 9.91 E+37.
Query	Range: 0 to 9999999999, 9.91 E+37 Resolution: 1
Programming Example `OUTPUT 714;"CALL:COUNt:MS:IP:ALL?"`	

CALL:COUNt:MS:IP:RX?

Function	Queries the data received by the device being tested. Data is returned in the following order: packets received, bytes received. The data connection type must be set to IPData. See "CALL:FUNCtion:DATA:TYPE" . If the data type is not IP Data, this query will return 9.91 E+37.
Query	Range: 0 to 9999999999, 9.91 E+37 Resolution: 1
Programming Example `OUTPUT 714;"CALL:COUNt:MS:IP:RX?"`	

CALL:COUNt:MS:IP:TX?

Function	Queries the data transmitted by the device being tested. Data is returned in the following order: packets transmitted, bytes transmitted. The data connection type must be set to IP Data. See "CALL:FUNCtion:DATA:TYPE" . If the data type is not IP Data, this query will return 9.91 E+37.
Query	Range: 0 to 9999999999, 9.91 E+37 Resolution: 1
Programming Example `OUTPUT 714;"CALL:COUNt:MS:IP:TX?"`	

CALL:COUNt:PRACh?

Function	Queries the number of PRACHs received. Used in conjunction with the PBCCH. Valid in all data connection types.
Query	Range: 0 to 9999, 9.91 E+37 Resolution: 1
Programming Example `OUTPUT 714;"CALL:COUNt:PRACh?"`	

CALL:COUNt:RACH[:SELected]?

Function	This command queries the RACH counter in the active (that is the selected) format. The RACH counter keeps track of the number of RACH bursts received by the base station emulator during data connection setup attempts.
Query	Range: 0 to 9999 Resolution: 1
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.

Programming Example

```
OUTPUT 714;"CALL:COUNt:RACH?" !Returns the number of RACH bursts received
                             !by the base station emulator during
                             !call setup/data connection attempts.
```

CALL:COUNt:RACH:GPRS?

Function	This command queries the RACH counter in the GPRS format whether or not that format is active. The RACH counter keeps track of the number of RACH bursts received by the base station emulator during data connection setup attempts.
Query	Range: 0 to 9999 Resolution: 1
*RST Setting	0

Programming Example

```
OUTPUT 714;"CALL:COUNt:RACH:GPRS?" !Returns the number of RACH bursts received
                                  !by the base station emulator during
                                  !call setup/data connection attempts.
```

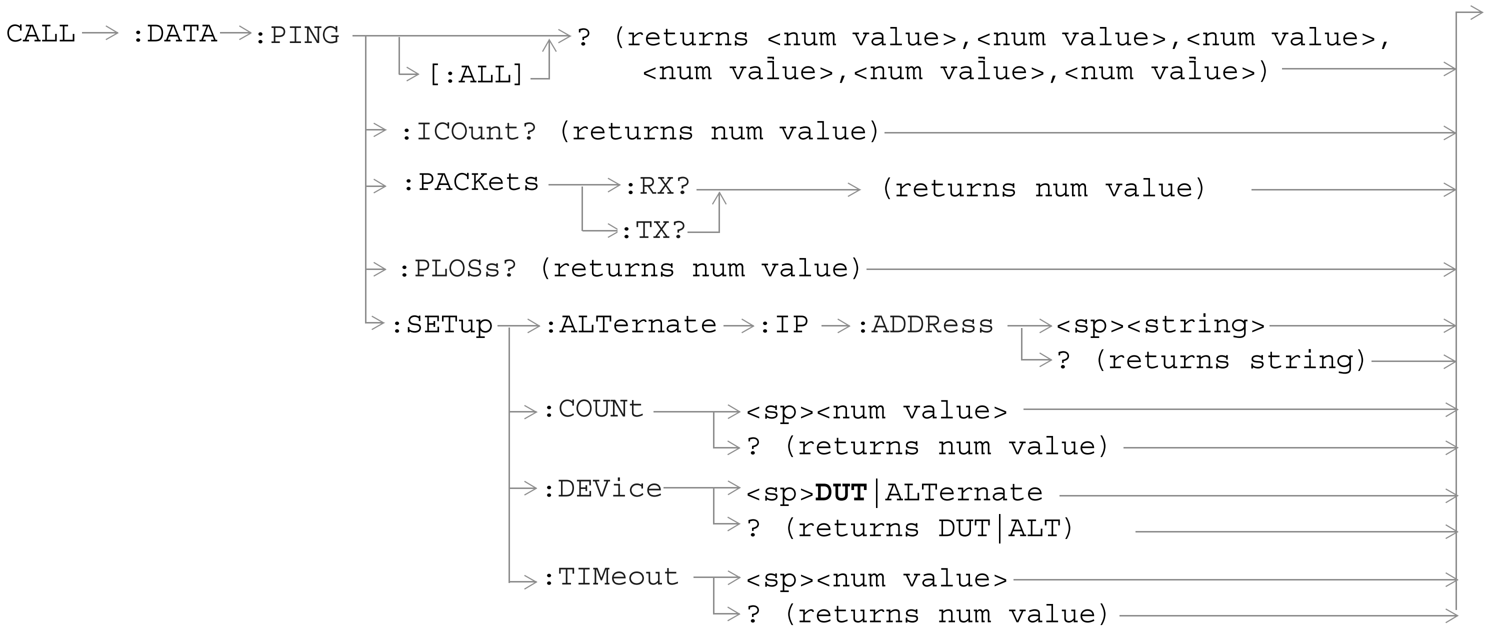
CALL:COUNt:TDMA:FNUMber[:SELected]?

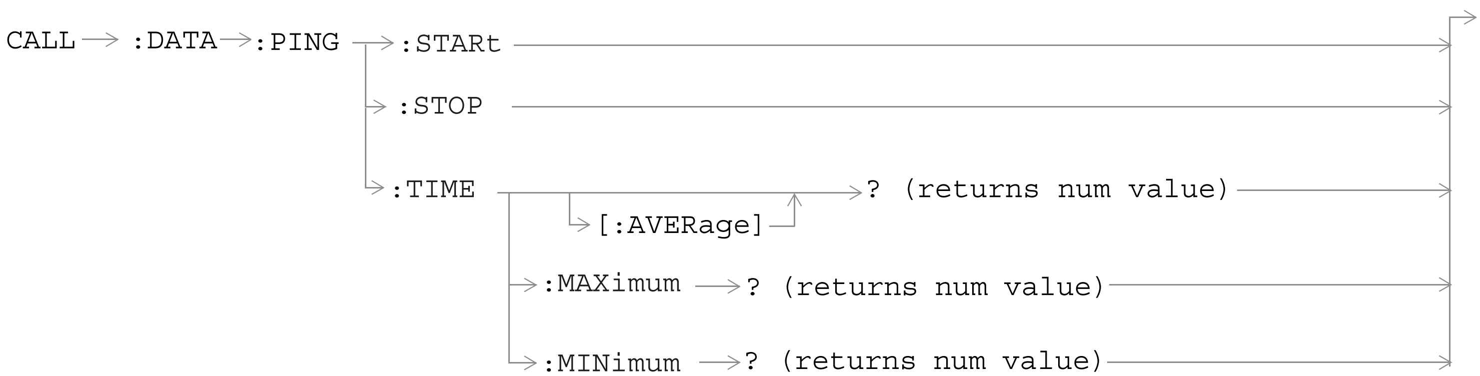
Function	Queries the current frame number.

Programming Example

```
OUTPUT 714;”CALL:COUNt:TDMA:FNUM?” !Queries the current frame number.
```

CALL:DATA:PING





"Diagram Conventions" on page 160

CALL:DATA:PING[:ALL]?

Function	This command returns the following results: packets transmitted, packets received, percent packets lost, minimum round trip time (in seconds), average round trip time (in seconds), maximum round trip time (in seconds). This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.

Programming Example `OUTPUT 714;"CALL:DATA:PING:ALL?"` `ENTER 714;Pxmit,Prcvd,Plost,Min_time,Avg_time,Max_time`

CALL:DATA:PING:ICOunt?

Function	This command queries the value that is available when the query is received.
Programming Example `OUTPUT 714;"CALL:DATA:PING:ICOUNT?"` `ENTER 714;variable_name`	

CALL:DATA:PING:PACKets:RX?

Function	This command queries the number of packets received from the device being tested or from the alternate device if "CALL:DATA:PING:SETup:DEVice" is set to ALTernate. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.
Programming Example `OUTPUT 714;"CALL:DATA:PING:PACKETS:RX?"` `ENTER 714;variable_name` `!Queries the number of packets received from the device being tested.`	

CALL:DATA:PING:PACKets:TX?

Function	This queries the number of packets transmitted from the test set. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.
Programming Example `OUTPUT 714;"CALL:DATA:PING:PACKETS:TX?"` `ENTER 714;variable_name` `!Queries the number of packets transmitted from the test set.`	

CALL:DATA:PING:PLOSs?

Function	This command queries the percentage of packets lost during the ping session. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.

Programming Example	
`OUTPUT 714;"CALL:DATA:PING:PLOSS?" !Queries the percentage of lost packets.`	
`ENTER 714;variable_name`	

CALL:DATA:PING:SETup:ALTernate:IP:ADDRess

Function	This command sets/queries the alternate internet protocol (IP) address. This address will be used as the address to ping instead of the device under test if the "CALL:DATA:PING:SETup:DEVice" command is set to ALTernate.
Setting	Range: IP v4 address in dotted decimal format.
Query	Range: IP v4 address in dotted decimal format.
Programming Example	
`OUTPUT 714;"CALL:DATA:PING:SETUP:ALTERNATE:IP:ADDRESS '192.168.16.57'"`	

CALL:DATA:PING:SETup:COUNt

Function	This command sets/queries the number of ping IP messages sent for each uninterrupted invocation of the "CALL:DATA:PING:STARt" command.
Setting	Range: 1 to 1000
Query	Range: 1 to 1000
*RST Setting	10
Programming Example	
`OUTPUT 714;"CALL:DATA:PING:SETUP:COUNT 20"`	

CALL:DATA:PING:SETup:DEVice

Function	This command sets/queries which device address is used in the ping IP packets, the address of the device under test, or the address of an alternate device.
Setting	Range: DUT | ALTernate
Query	Range: DUT | ALT
*RST Setting	DUT
Programming Example	
`OUTPUT 714;"CALL:DATA:PING:SETUP:DEVice ALT"`	

CALL:DATA:PING:SETup:TIMeout

Function	This command sets/queries how long the test set will wait before ending a ping session. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.
Setting	Range: 1 to 100 seconds

Query	Range: 1 to 100 seconds
*RST Setting	5 seconds
Programming Example OUTPUT 714;"CALL:DATA:PING:SETUP:TIMEOUT 10"	

CALL:DATA:PING:STARt

Function	This command starts a ping session.
Programming Example OUTPUT 714;"CALL:DATA:PING:START"	

CALL:DATA:PING:STOP

Function	This command immediately stops a ping session. The ping results will not include counts for any ping message that has not yet received a response.
Programming Example OUTPUT 714;"CALL:DATA:PING:STOP"	

CALL:DATA:PING:TIME[:AVERage]?

Function	This command queries the average round trip time (in seconds) for a series of pings. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.
Programming Example OUTPUT 714;"CALL:DATA:PING:TIME:AVERAGE?" ENTER 714;variable_name	

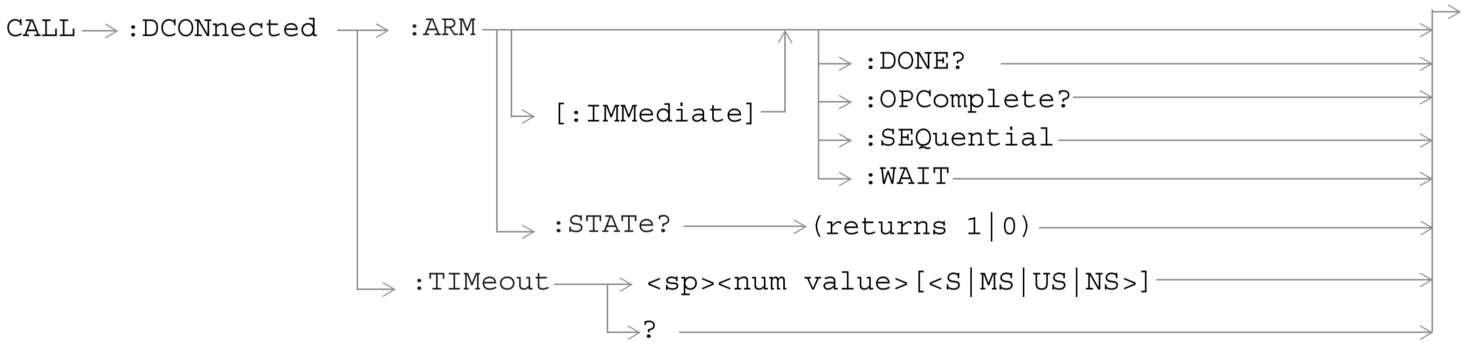
CALL:DATA:PING:TIME:MAXimum?

Function	This command queries the maximum round trip time (in seconds) for a series of pings. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.
Programming Example OUTPUT 714;"CALL:DATA:PING:TIME:MAXIMUM?" ENTER 714;variable_name	

CALL:DATA:PING:TIME:MINimum?

Function	This command queries the minimum round trip time (in seconds) for a series of pings. This command will return 9.91 E+37 if the CALL:FUNCtion:DATA:TYPE command is not set to IPData, or if ping results are not available.
Programming Example `OUTPUT 714;"CALL:DATA:PING:TIME:MINIMUM?"` `ENTER 714;variable_name`	

CALL:DCONnected



"Diagram Conventions" on page 160

CALL:DCONnected:ARM[:IMMediate]

Function	Sets (arms) the data connection state change detector. Arming the data connection state change detector allows the control program to tell the test set that it is expecting a change to the state of a data connection prior to initiating the state change. Once armed, the detector remains armed until there is a data connection state change to Idle, Attached or Transferring, from one of the transitory states. The data connection state change detector is not disarmed by a connection state change to one of the transitory states, nor is it disarmed by any transitions from Idle to Idle, Attached to Attached or Transferring to Transferring. When this command is used in conjunction with CALL:ATTached:STATe?, CALL:TRANsferring:STATe?, and CALL:DCONnected:TIMeout, it allows the control program to synchronize to data connection/disconnection. See "Data Connection Processing State Synchronization" on page 155. Additional commands can be appended to aid in controller/Mobile Station synchronization. See "Data Connection Processing Event Synchronization" on page 153.
Programming Example `OUTPUT 714;"CALL:DCONnected:ARM:IMMediate" !Arms the data connection state change detector.`	

CALL:DCONnected:ARM:STATe?

Function	Queries whether the data connection state change detector is armed or not. This command immediately returns a 1 if the data connection state change detector is armed and a 0 if it is not armed. See "Data Connection Processing State Synchronization" on page 155.
Query	Range: 0|1
*RST Setting	0

Programming Example
`OUTPUT 714;"CALL:DCONnected:ARM:STATe?” !Returns arm state of` `!data connection state change detector.`

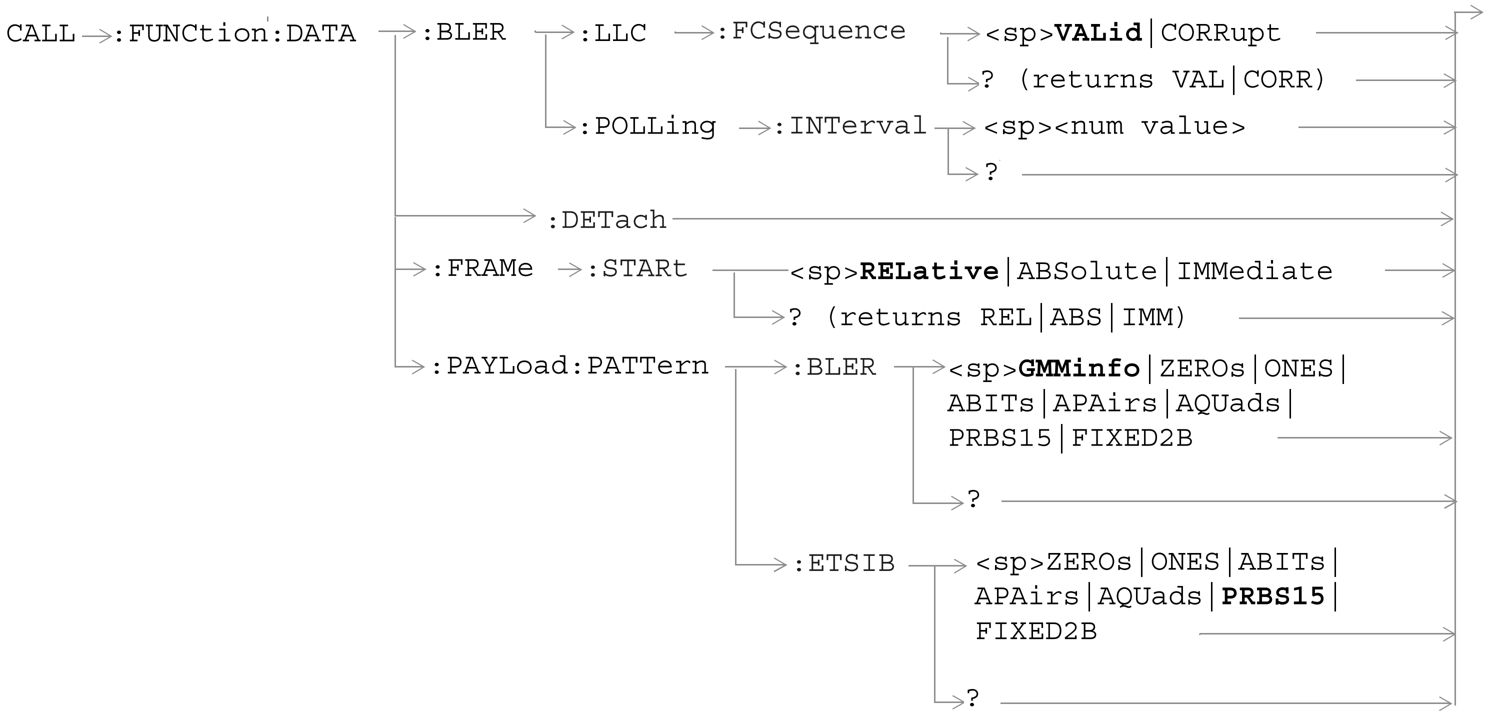
CALL:DCONnected:TIMeout

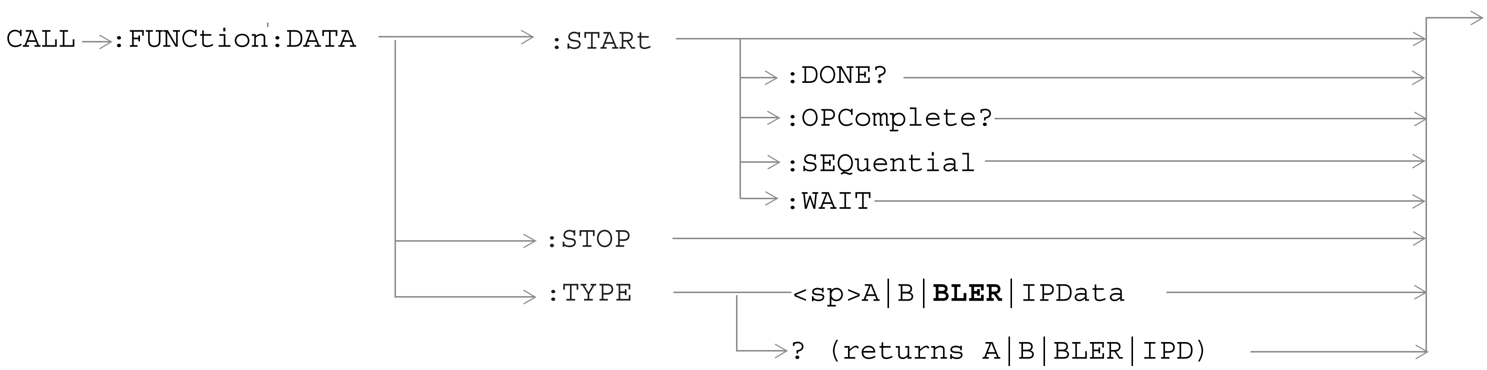
Function	Sets/queries the maximum time the test set will wait for a hanging CALL:ATTached[:STATe]? and CALL:TRANsferring[:STATe]? query to complete. The default setting units are seconds. A timeout timer is started whenever the data connection state change detector becomes armed. You can set the duration of the timeout using this command. The timeout should be greater than the maximum amount of time the control program needs to wait between arming the data connection state change detector and the connect/disconnect operation starting. Once the process starts and the data connection state has moved into one of the transitory states the pre-defined GPRS timers prevent the data connection state from staying in a transitory state forever. See “Data Connection Processing State Synchronization” on page 155.
Setting	Range: 0 to 100 seconds Resolution: 0.1 seconds
Query	Range: 0 to 100 seconds Resolution: 0.1 seconds
*RST Setting	10 seconds
Related Topics	“Data Connection Processing State Synchronization” on page 155
	“Data Connection Processing Event Synchronization” on page 153

Programming Example

```
OUTPUT 714;”CALL:DCONnected:TIMeout 3” !Sets the CALL:DCONected: STSTe? query timeout time to 3
                                       !seconds.
```

CALL:FUNCtion





"Diagram Conventions" on page 160

CALL:FUNCtion:DATA:BLER:LLC:FCSequence

Function	This command sets/queries whether or not the Logical Link Control (LLC) Frame Check Sequence (FCS) is corrupted in order to establish a BLER mode data connection. Setting this parameter to VALid ensures that the cyclic redundancy check code within the FCS is valid. Setting this parameter to CORRupt causes the test set to transmit an invalid FCS to the mobile. This setting may enable some mobiles to establish a BLER mode data connection which would not otherwise be possible with a valid FCS. This parameter is only applicable when the data connection type is set to BLER using "CALL:FUNCtion:DATA:TYPE" on page 211. If you change this parameter while the data connection type is any type other than BLER, the setting has no effect until a new BLER mode data connection is established. This command along with "CALL:FUNCtion:DATA:BLER:POLLing:INTerval" on page 206 provides you with additional control over BLER data connection type settings. This may enable the test set to establish a BLER mode data connection with mobiles which cannot connect under normal conditions.
Setting	Range: VALid | CORRupt
Query	Range: VAL | CORR
*RST Setting	VALid

Programming Example

```
OUTPUT 714;"CALL:FUNCTION:DATA:BLER:LLC:FCSEQUENCE CORRUPT" !Sets the test set to transmit
                                                            ! an invalid FCS to the mobile.
```

CALL:FUNCtion:DATA:BLER:POLLing:INTerval

Function	This command sets/queries the block polling interval during a BLER mode data connection. For example, if you set this parameter to a value of 4, polling is performed once in every four blocks. This parameter is only applicable when the data connection type is set to BLER using "CALL:FUNCtion:DATA:TYPE" on page 211. If you change this parameter while the data connection type is any type other than BLER, the setting has no effect until a new BLER mode data connection is established. This command along with "CALL:FUNCtion:DATA:BLER:LLC:FCSequence" on page 206 provides you with additional control over BLER data connection type settings. This may enable the test set to establish a BLER mode data connection with mobiles which cannot connect under normal conditions.
Setting	Range: 1 to 32 Resolution: 1
Query	Range: 1 to 32 Resolution: 1
*RST setting	1

Programming Example

```
OUTPUT 714;"CALL:FUNCTION:DATA:BLER:POLLING:INTERVAL 8" !Sets the block polling interval to
                                                        !8.
```

CALL:FUNCtion:DATA:DETach

Function	This command performs a test set initiated GPRS Detach.
Programming Example	`OUTPUT 714;"CALL:FUNCTION:DATA:DETACH" !Detaches the mobile from the test set.`

CALL:FUNCtion:DATA:FRAMe:STARt

Function	This command sets/queries the type of frame numbering scheme to be used when establishing a data connection. Changing the frame numbering scheme may enable the test set to establish a data connection with mobiles which cannot connect under normal conditions. When you set this command to: • RELative, the test set sends the starting frame number to the mobile as a relative offset from the current frame. • ABSolute, the test set sends the starting frame number to the mobile as an absolute frame number. • IMMediate, the test set sends the starting frame number as an immediate assignment. It is recommended that you should not change this parameter while the data connection status is Starting, as there is no guarantee whether the new setting or the previous setting will be used for the current data connection. If the type of data connection you want to establish is BLER, the commands "CALL:FUNCtion:DATA:BLER:LLC:FCSequence" on page 206 and "CALL:FUNCtion:DATA:BLER:POLLing:INTerval" on page 206 may also be helpful in enabling the test set to establish a data connection with mobiles which cannot establish a BLER data connection under normal conditions.
Setting	Range: RELative | ABSolute | IMMediate
Query	Range: REL | ABS | IMM
*RST Setting	REL
Programming Example	`OUTPUT 714;"CALL:FUNCTION:DATA:FRAME:START ABSOLUTE" !Sets the frame number type to !Absolute.`

CALL:FUNCtion:DATA:PAYLoad:PATTern:BLER

<table>
<tr><td>Function</td><td>This command sets/queries the type of downlink payload pattern to be sent to the mobile when the data connection type is set to BLER (see “CALL:FUNCtion:DATA:TYPE” on page 211) in Active Cell operating mode, and the LLC Frame Check Sequence parameter is set to CORRupt (see “CALL:FUNCtion:DATA:BLER:LLC:FCSequence” on page 206).

When you set this command to:

• GMMinfo, the payload pattern is set to send GMM Information messages. If “CALL:FUNCtion:DATA:BLER:LLC:FCSequence” on page 206 is set to VALid, this type of payload pattern is always sent irrespective of the setting of this command.
• ZEROs, the payload pattern is set to All Zeros.
• ONES, the payload pattern is set to All Ones.
• ABITs, the payload pattern is set to Alternate Bits.
• APAIRs, the payload pattern is set to Alternate Pairs.
• AQUads, the payload pattern is set to Alternate Quads.
• PRBS15, the payload pattern is set to pseudo-random binary sequence 15 data.
• FIXED2B, the payload pattern is set to Fixed 2B Hexadecimal data.

NOTE If this command is set to any value other than GMMinfo, and you want to change the setting of the LLC Frame Check Sequence parameter from CORRupt to VALid, it is strongly recommended that you end the data connection before making this change. After the LLC Frame Check Sequence parameter has been set to VALid, the data connection can be restarted using “CALL:FUNCtion:DATA:STARt” on page 210.</td></tr>
<tr><td>Setting</td><td>Range: GMMinfo | ZEROs | ONES | ABITs | APAirs | AQUads | PRBS15 | FIXED2B</td></tr>
<tr><td>Query</td><td>Range: GMM | ZERO | ONES | ABIT | APA | AQU | PRBS15 | FIXED2B</td></tr>
<tr><td>*RST Setting</td><td>GMM</td></tr>
<tr><td colspan="2">Programming Example

<code>OUTPUT 714;”CALL:FUNCTION:DATA:PAYLoad:PATTern:BLER ONES” !Sets the payload pattern to</code>
<code>! be All Ones.</code></td></tr>
</table>

CALL:FUNCtion:DATA:PAYLoad:PATTern:ETSIB

Function	This command sets/queries the type of downlink payload pattern to be used when the test set's operating mode is set to either BCH+PDTCH Test Mode, or Active Cell operating mode with the data connection type set to ETSI Type B (see "CALL:FUNCtion:DATA:TYPE" on page 211). Changes to the payload pattern setting become effective immediately. When you set this command to: ZEROs, the payload pattern is set to All Zeros. ONES, the payload pattern is set to All Ones. ABITs, the payload pattern is set to Alternate Bits. APAIRs, the payload pattern is set to Alternate Pairs. AQUads, the payload pattern is set to Alternate Quads. PRBS15, the payload pattern is set to pseudo-random binary sequence 15 data. FIXED2B, the payload pattern is set to Fixed 2B Hexadecimal data.
Setting	Range: ZEROs | ONES | ABITs | APAirs | AQUads | PRBS15 | FIXED2B
Query	Range: ZERO | ONES | ABIT | APA | AQU | PRBS15 | FIXED2B
*RST Setting	PRBS15

Programming Example

```
OUTPUT 714;"CALL:FUNCTION:DATA:PAYLoad:PATTern:ETSIB AQUADS" !Sets the payload pattern to
                                                             ! be Alternate Quads.
```

CALL:FUNCtion:DATA:STARt

Function	This command attempts to start the data connection. See "Data Connection Processing Event Synchronization" on page 153. Additional commands can be appended to aid in controller/mobile station synchronization. See "Call Processing Subsystem Overlapped Commands" on page 153 for examples.

Programming Example

```
OUTPUT 714;"CALL:FUNCTION:DATA:START" !Starts data connection.
```

CALL:FUNCtion:DATA:STOP

Function	This command ends the data connection.

Programming Example

```
OUTPUT 714;"CALL:FUNCTION:DATA:STOP" !Ends data connection.
```

CALL:FUNCtion:DATA:TYPE

Function	This command sets/queries the type of data connection that is used when you use the command “CALL:FUNCtion:DATA:STARt” on page 210 to start a data connection. If you set this parameter to ETSI Type A, no packet data traffic channel (PDTCH) bursts will be transmitted on the downlink. Setting this parameter to ETSI Type B ensures that one or more downlink (PDTCH) bursts are present, which can be used to loopback data through the uplink. The number of downlink bursts is determined by the setting of the command “CALL:PDTCH:MSLot:CONFiguration” on page 232. Setting this parameter to BLER ensures that an Agilent proprietary data connection type is used which allows the test set to obtain BLock Error Rate (BLER) measurement reports from the mobile station (see “Block Error Rate (BLER) Reports Description” on page 95). It is recommended that you should always end the data connection (using “CALL:FUNCtion:DATA:STOP” on page 210) before changing the data connection type. If you change this parameter while the data connection status is transferring, the data connection will be dropped (changing the data connection status to attached), and an error message will be generated. Logging is possible with all data types, but if the data type is not IPData, no log information will be generated for SNDCP and IP.
Setting	Range: • GPRS PA: A|B|BLER|IPData
Query	Range: • GPRS PA: A|B|BLER|IPD
*RST Setting	BLER
Programming Example	

```
OUTPUT 714;”CALL:FUNCTION:DATA:TYPE B” !Sets the data connection type to ETSI Type B.
```

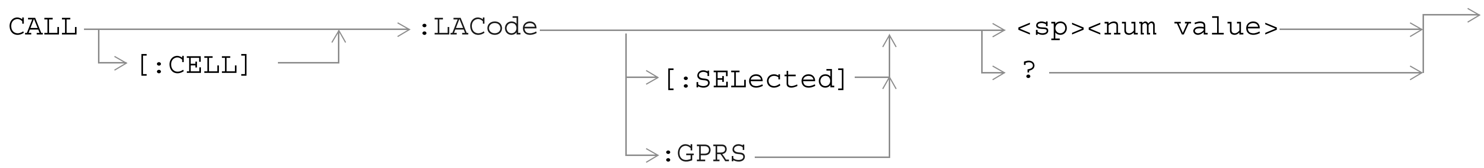
CALL:HANDover|HANDoff

"Diagram Conventions" on page 160

CALL:HANDover | HANDoff[:IMMediate]

Function	This command applies the deferred PDTCH parameters to the active PDTCH. These parameters are: • Deferred PDTCH Band • Deferred PDTCH ARFCN [band] • Deferred mobile station TX Level [burst][band] • Deferred Multislot Configuration • Deferred Coding Scheme • Deferred P0 For more information on the use of deferred parameters see "Using Deferred Parameters" on page 108. The action taken when this command is set depends on the setting of the cell operating mode and the data connection status: • When the cell operating mode is set to Active Cell (see "CALL:OPERating" on page 221) and the data connection status is Transferring, this command causes any necessary over-the-air signaling to modify the PDTCH resources (frequency, power level, timeslot assignment and coding scheme). The immediate settings are updated with the deferred settings just applied and the current downlink PDTCH levels are updated. • When the cell operating mode is set to Active Cell (see "CALL:OPERating" on page 221) and the data connection status is any state other than Transferring, this command does not cause any over -the-air signaling with the mobile station. The immediate settings are updated with the deferred settings just applied. • When the cell operating mode is not set to Active Cell, this command replaces any active PDTCHs with new PDTCHs using the new parameters. If there are no active PDTCHs, the new values will be remembered until there is an active PDTCH. In either case, the immediate settings are updated with the deferred settings just applied and the current downlink PDTCH levels are updated.
Programming Example `OUTPUT 714;"CALL:HANDover:IMMediate"`	

CALL:LACode



"Diagram Conventions" on page 160

CALL[:CELL]:LACode[:SELected]

Function	Sets/queries the value of the cell's Location Area Code (LAC) for the active (that is the selected) format.
Setting	Range: 0 to 65535 Resolution: 1
Query	Range: 0 to 65535 Resolution: 1
*RST Setting	1
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104
Programming Example	

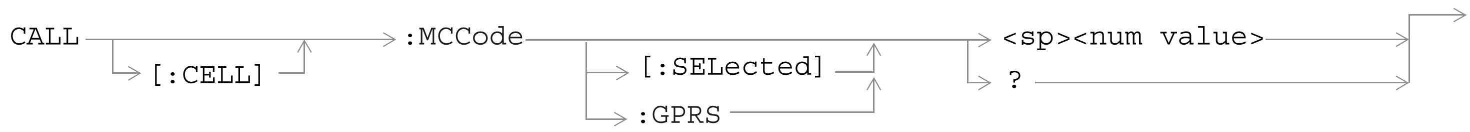
```
OUTPUT 714;"CALL:CELL:LACODE:SELECTED 456" !Sets the cell's location area code 456.
```

CALL[:CELL]:LACode:GPRS

Function	Sets/queries the value of the cell's Location Area Code (LAC) for the GPRS format.
Setting	Range: 0 to 65535 Resolution: 1
Query	Range: 0 to 65535 Resolution: 1
*RST Setting	1
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104
Programming Example	

```
OUTPUT 714;"CALL:CELL:LACODE:GPRS 456" !Sets the cell's location area code 456.
```

CALL:MCCode



"Diagram Conventions" on page 160

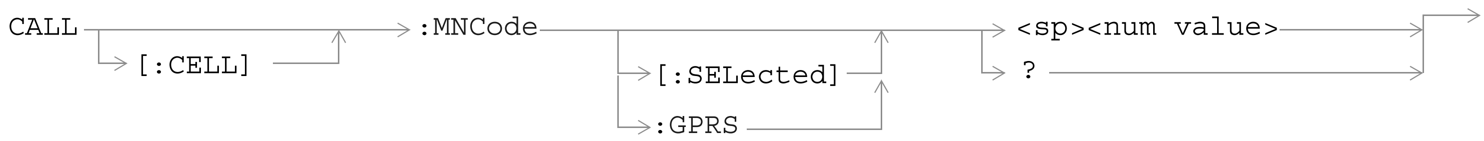
CALL[:CELL]:MCCode[:SELected]

Function	Sets/queries the value of the Mobile Country Code (MCC) for the active (that is the selected) format.
Setting	Range: 0 to 999 Resolution: 1
Query	Range: 0 to 999 Resolution: 1
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104
Programming Example `OUTPUT 714;"CALL:CELL:MCCODE:SELECTED 4" !Sets the cell's mobile country code to 4.`	

CALL[:CELL]:MCCode:GPRS

Function	Sets/queries the value of the Mobile Country Code (MCC) for the GPRS format.
Setting	Range: 0 to 999 Resolution: 1
Query	Range: 0 to 999 Resolution: 1
*RST Setting	1
Related Topics	"Configuring the Broadcast Channel (BCH)" on page 104
Programming Example `OUTPUT 714;"CALL:CELL:MCCODE:GPRS 4" !Sets the cell's mobile country code to 4.`	

CALL:MNCode



“Diagram Conventions” on page 160

CALL[:CELL]:MNCode[:SELected]

Function	Sets/queries the value of the Mobile Network Code (MNC) for the active (that is the selected) format.
Setting	Range: 0 to 99 Resolution: 1
Query	Range: 0 to 99 Resolution: 1
*RST Setting	1
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104
Programming Example `OUTPUT 714;”CALL:CELL:MNCODE:SELECTED 45” !Sets the cell’s mobile network code to 45.`	

CALL[:CELL]:MNCode:GPRS

Function	Sets/queries the value of the Mobile Network Code (MNC) for the GPRS format.
Setting	Range: 0 to 99 Resolution: 1
Query	Range: 0 to 99 Resolution: 1
*RST Setting	1
Related Topics	“Configuring the Broadcast Channel (BCH)” on page 104
Programming Example `OUTPUT 714;”CALL:CELL:MNCODE:GPRS 45” !Sets the cell’s mobile network code to 45.`	

CALL:MS

```
CALL ──> :MS ──> :IP ──> :ADDRess ──┬──> <sp>'<string>' ──────────────┬──>
                                    └──> ? (returns string) ──────────┘
```

```
CALL ──> :MS ──> :TX ──> :BURSt ──> :GPLength ──┬──> <sp>GPL9|GPL10 ─────────────┬──>
                                                └──> ? (returns GPL9|GPL10) ─────┘
```

```
CALL ──> :MS ──> :REPorted ──┬──> :CLEar ───────────────────────────────────────────────────────┬──>
                             ├──> :CVALue ─────> :AVERage? ──> (returns num value) ──────────────┤
                             ├──> :RXQuality ──> :AVERage? ──> (returns num value) ──────────────┤
                             ├──> :SVARianceue ─> :AVERage? ──> (returns num value) ─────────────┤
                             └──> :ILEVel ──> :TSLOt<Timeslot number> ──> :AVERage? ──┐          │
                                                     ┌────────────────────────────────┘          │
                                                     └──> (returns num value) ───────────────────┘
```

Notes: Measurement Reports are available in ETSI B, BLER and IP Data connection types.

"Diagram Conventions" on page 160

CALL:MS:IP:ADDRess

Function	This command sets/queries the mobile station's internet protocol (IP) address. The address is and IP v4 address written in dotted decimal format, for example 147.123.159.15. The entered address must be on the same subnet as the test set (but it cannot have an identical address). The subnet is defined through the combination of the test set's LAN IP address ("SYSTem:COMMunicate:LAN[:SELF]:ADDRess") and its subnet mask ("SYSTem:COMMunicate:LAN[:SELF]:SMASk"). Values entered for this command are stored in non-volatile memory and will persist after the instrument is reset or power-cycled. Any part of this address with leading zeros (for example, 145.156.063.12) will have the leading zeros removed. Most operating systems treat parts of IP addresses entered with leading zeros as octal numbers, the test set does not.
*RST Setting	none
Programming Example `OUTPUT 714;"CALL:MS:IP:ADDRESS '147.123.159.15'"`	

CALL:MS:TX:BURSt:GPLength

Function	This command defines the width of the guard period between the two uplink bursts. The command and parameters to use are determined by the mobile station segmentation of the TDMA frame and the particular bursts transmitted in the multislot configuration. Whether or not you need to use this command depends on your mobile station. If the mobile station segments the frame into six bursts of 156 bit duration and two bursts of 157 bit duration then this command should be set as follows: • Use GPL10 if the first burst in the multislot configuration is timeslot 4 or 7. • Use GPL9 if the first burst in the multislot configuration is in any other timeslot.
Setting	Range: GPL9 | GPL10
Query	Range: GPL9 | GPL10
*RST Setting	GPL9
Programming Example `OUTPUT 714;"CALL:MS:TX:BURSt:GPLength GPL9" !Sets the Guard Period` `!length to 9 bits.`	

CALL:MS:REPorted:CLEar

Function	This command clears the mobile station measurement reported items. The values of the four mobile reported items - that is, C Value, Rx Quality, Signal Variance and Interference Level.
Programming Example `OUTPUT 714;"CALL:MS:REPORTED:CLEAR"`	

CALL:MS:REPorted:CVALue:AVERage?

Function	Queries the C Value.
Query	Range: 0-63. See following table for details.

Table 9. C Value Range

C Value	Reported Received Signal Level
0	<-110 dBm
1	-110 dBm to -109 dBm
2	-109 dBm to -108 dBm
...	...
63	>-48 dBm

CALL:MS:REPorted:RXQuality:AVERage?

Function	Queries the Received Signal Quality.
Query	Range: 0-63. See following table for details.

Table 10. RX Quality Range

Value	Received Signal Level
0	0%<BER<0.2%
1	<0.2%<BER<0.4%
2	<0.4%<BER<0.8%
...	...
63	12.8%<BER

CALL:MS:REPorted:SVARiance:AVERage?

Function	Queries the variance of received signal level.
Query	Range: 0-63. See following table for details.

Table 11. Signal Variance Range

Value	Received Signal Level
0	0 dB^2
1	0.25 dB^2
2	0.5 dB^2

Table 11. Signal Variance Range

Value	Received Signal Level
...	...
63	15.75 dB^2

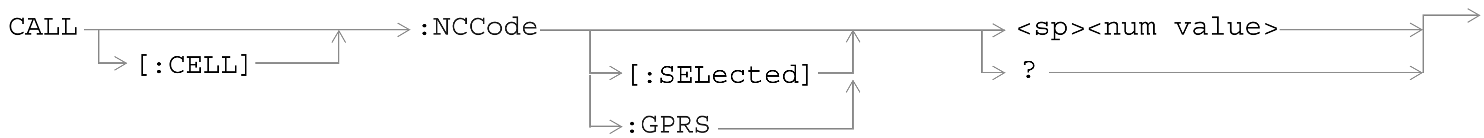
CALL:MS:REPorted:ILEVel:TSLot<n>:AVERage?

Function	Queries the Interference Levels on each timeslot.
Query	Timeslot range <n> = 0 to 7 Range: 0-63. See following table for details.

Table 12. Interference Level Range

Value	Interference Level
0	Interference level>Received Signal Level
1	Received Signal Level>=Interference level>Received Signal Level-2dB
2	Received Signal Level-2dB>=Interference level>Received Signal Level-4dB
...	...
63	Interference level<=Received Signal Level

CALL:NCCode



“Diagram Conventions” on page 160

CALL[:CELL]:NCCode[:SELected]

Function	Sets/queries the Network Color Code for the active (that is the selected) format. See “Configuring the Broadcast Channel (BCH)” on page 104.
Setting	Range: 0 to 7 Resolution: 1
Query	Range: 0 to 7 Resolution: 1
*RST Setting	1
Programming Example `OUTPUT 714;"CALL:CELL:NCCODE:SELECTED 2"`	

CALL[:CELL]:NCCode:GPRS

Function	Sets/queries the Network Color Code for the GPRS format. See “Configuring the Broadcast Channel (BCH)” on page 104.
Setting	Range: 0 to 7 Resolution: 1
Query	Range: 0 to 7 Resolution: 1
*RST Setting	1
Programming Example `OUTPUT 714;"CALL:CELL:NCCODE:GPRS 2"`	

CALL:OPERating

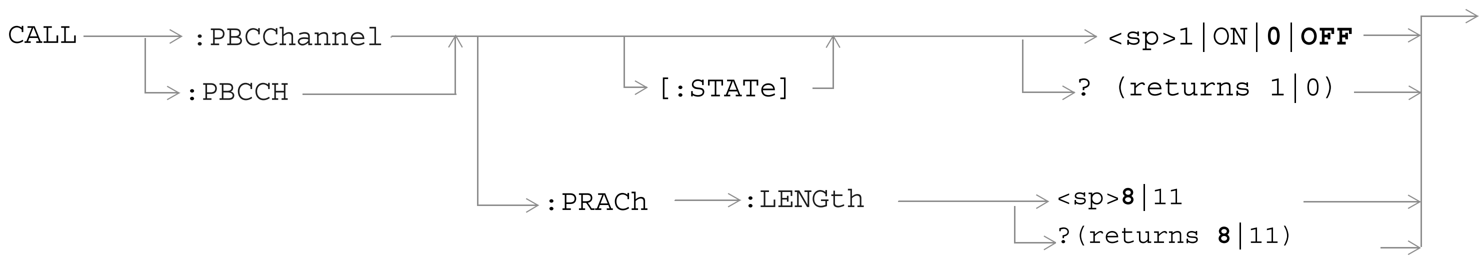
```
CALL ──> :OPERating:MODE ──────────> <sp>CELL|CALL|OFF|PBTest|PBPTest ──>
                                 └──> ? ──────────────────────────────────>
```

"Diagram Conventions" on page 160

CALL:OPERating:MODE

Function	This command sets/queries the operating mode (behavior) of the test set. CELL and CALL are exactly the same and set the operating mode to Active Cell (see "Active Cell Operating Mode" on page 101). The query returns CELL. PBTest sets the operating mode to GPRS Test Mode BCH (see "GPRS Test Mode BCH Behavior" on page 102). PBPTest sets the operating mode to GPRS Test Mode BCH+PDTCH (see "GPRS Test Mode BCH + PDTCH Behavior" on page 102). OFF sets the operating mode to OFF (see "OFF Behavior" on page 102).
Setting	Range: CALL | CELL |OFF| PBTest | PBPTest
Query	Range: CELL |OFF| PBTest | PBPTest
*RST Setting	CELL
Programming Example `OUTPUT 714;"CALL:OPERATING:MODE PBPTest" !Sets the operating mode to GPRS Test Mode PDTCH.`	

CALL:PBCChannel



“Diagram Conventions” on page 160

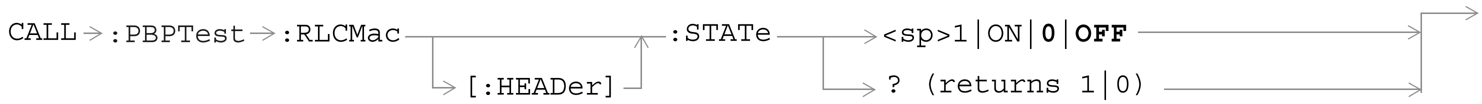
CALL:PBCChannel[:STATe]

Function	This command sets/queries the PBCCH channel state. This setting is applicable when the operating mode is not set to Cell Off. PBCCH can only be enabled when operating mode is set to Cell Off.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	0|OFF
Programming Example `OUTPUT 714;"CALL:PBCCH ON" !Enables the PBCCH channel.`	

CALL:PBCChannel:PRACh:LENGth

Function	This command sets/queries the number of bits in the PRACh of the PBCCH. This setting is applicable when the operating mode is not set to Cell Off. PBCCH can only be enabled when operating mode is set to Cell Off.
Setting	Range: 8 or 11
Query	Range: 8 or 11
*RST Setting	8
Programming Example `OUTPUT 714;"CALL:PBCCH:PRACh:LENGth?" !Queries the PRACH length.`	

CALL:PBPTest

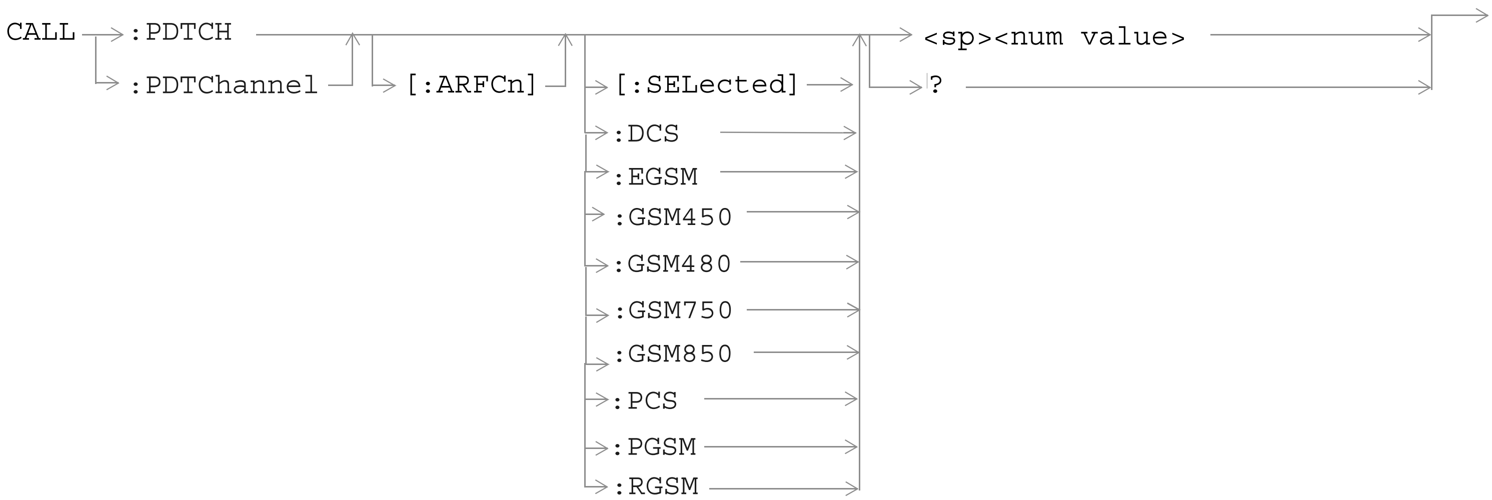


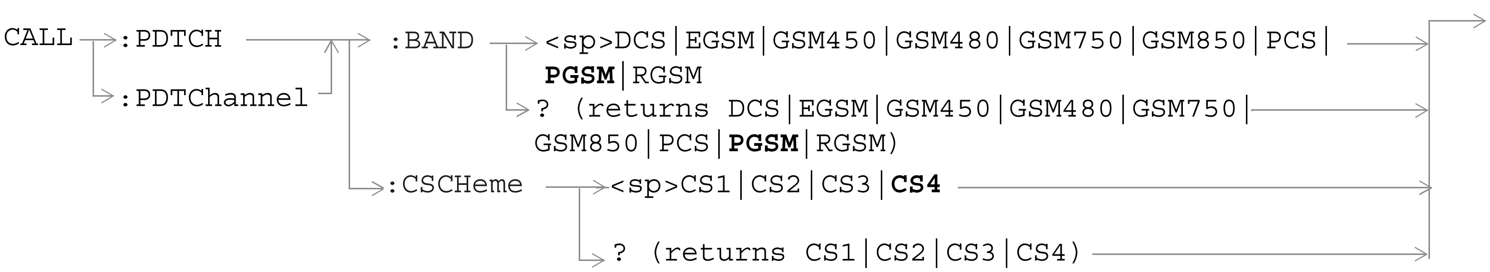
"Diagram Conventions" on page 160

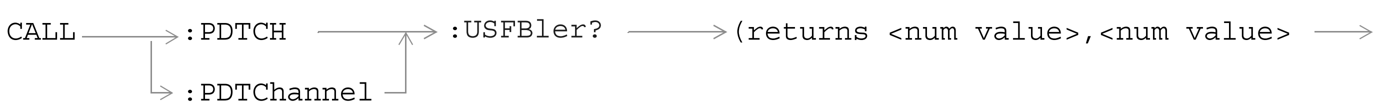
CALL:PBPTest:RLCMac[:HEADer]:STATe

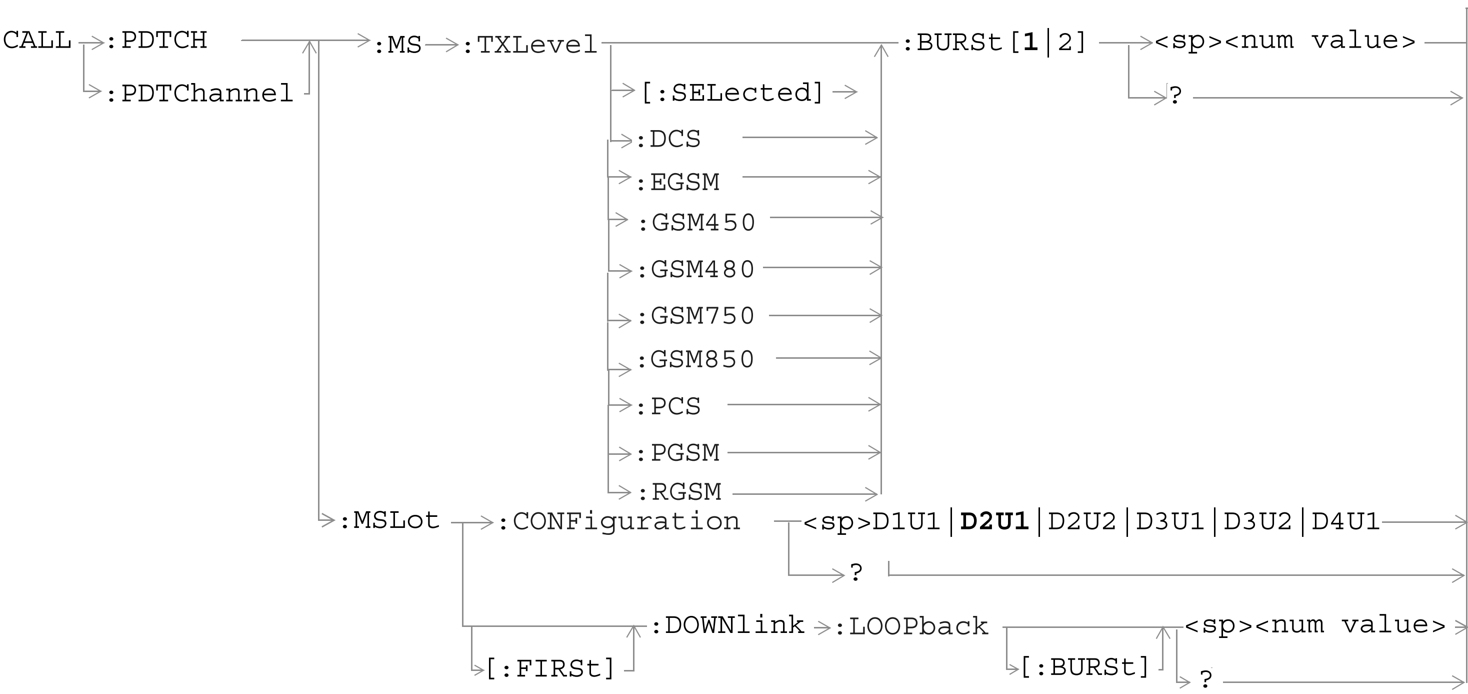
Function	This command sets/queries the RLC/MAC header state. This setting is only applicable when the operating mode is set to GPRS Test Mode BCH+PDTCH (PBPTest). If the RLC/MAC header state is changed when the operating mode is any mode other than GPRS Test Mode BCH+PDTCH, the setting is remembered until the next time you use GPRS Test Mode BCH+PDTCH.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	0|OFF
Programming Example	
`OUTPUT 714;"CALL:PBPTest:RLCMac:HEADer:STATe ON" !Enables the RLC/MAC header.`	

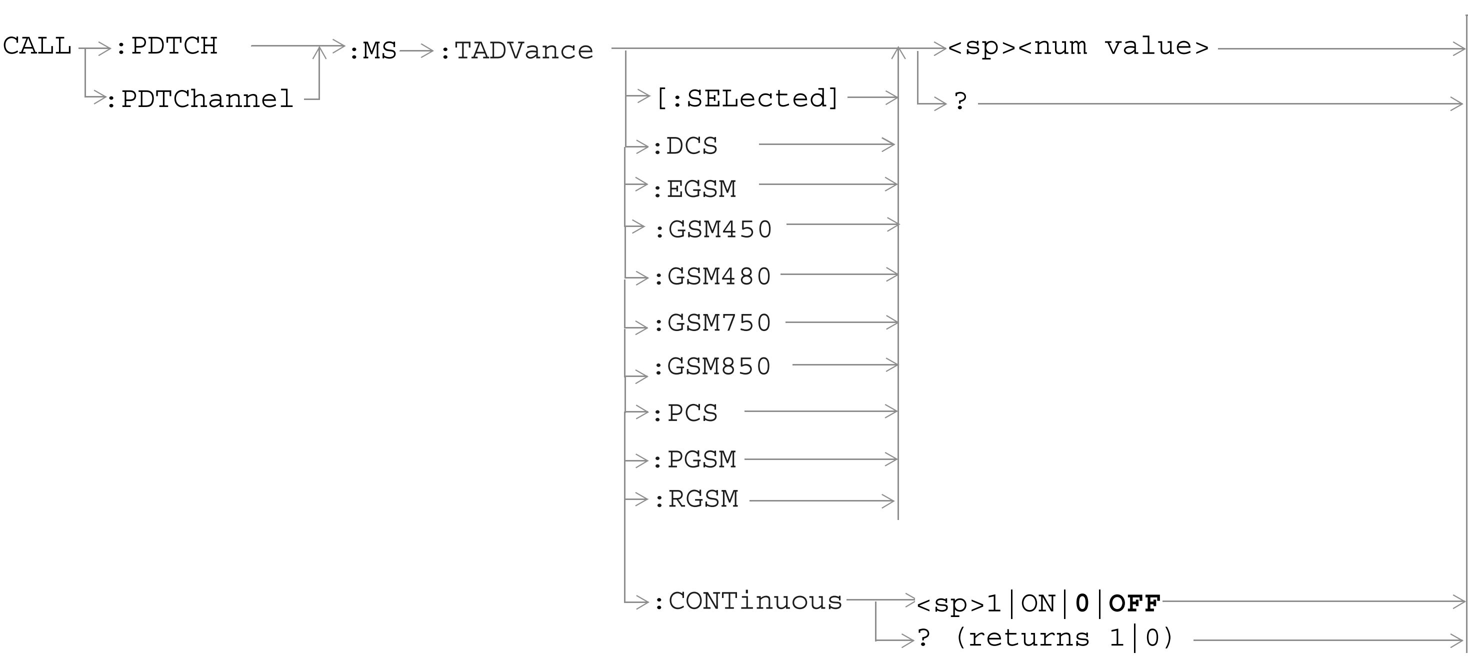
CALL:PDTCH|PDTChannel



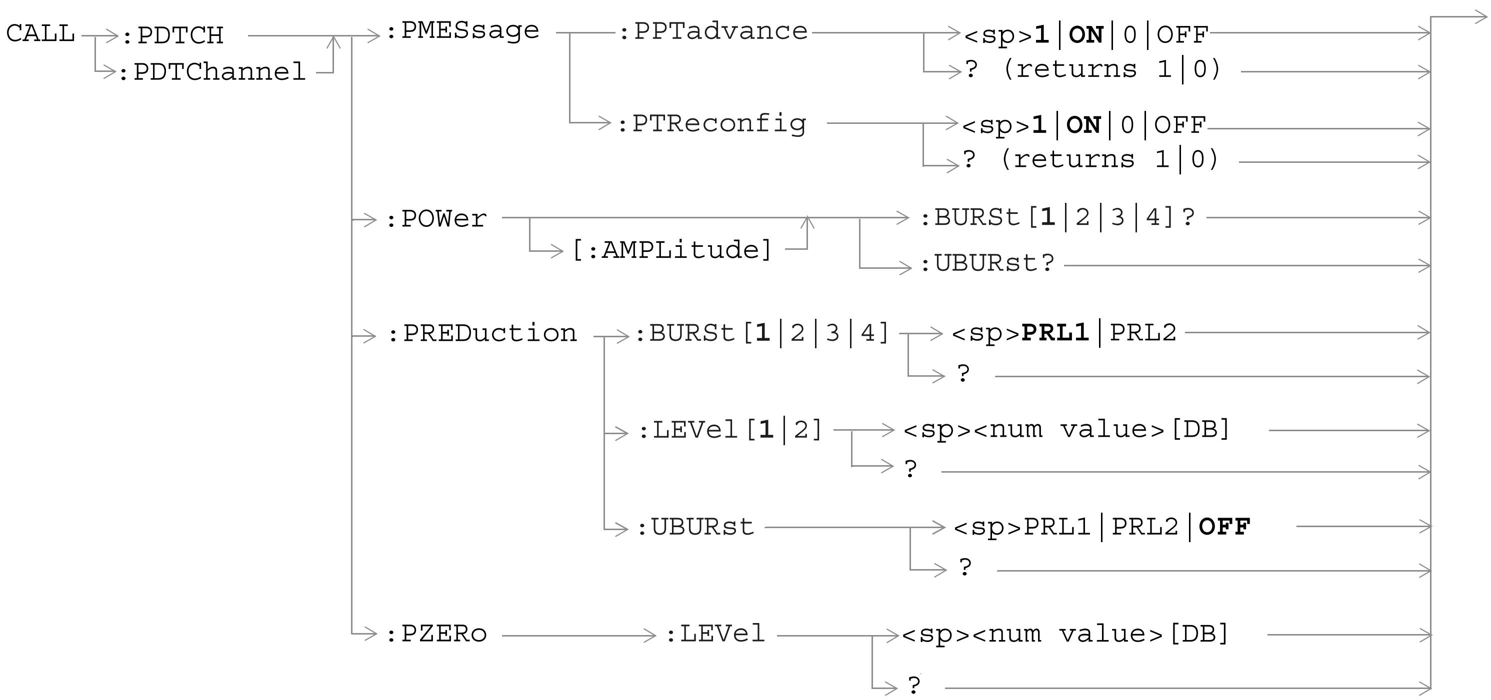


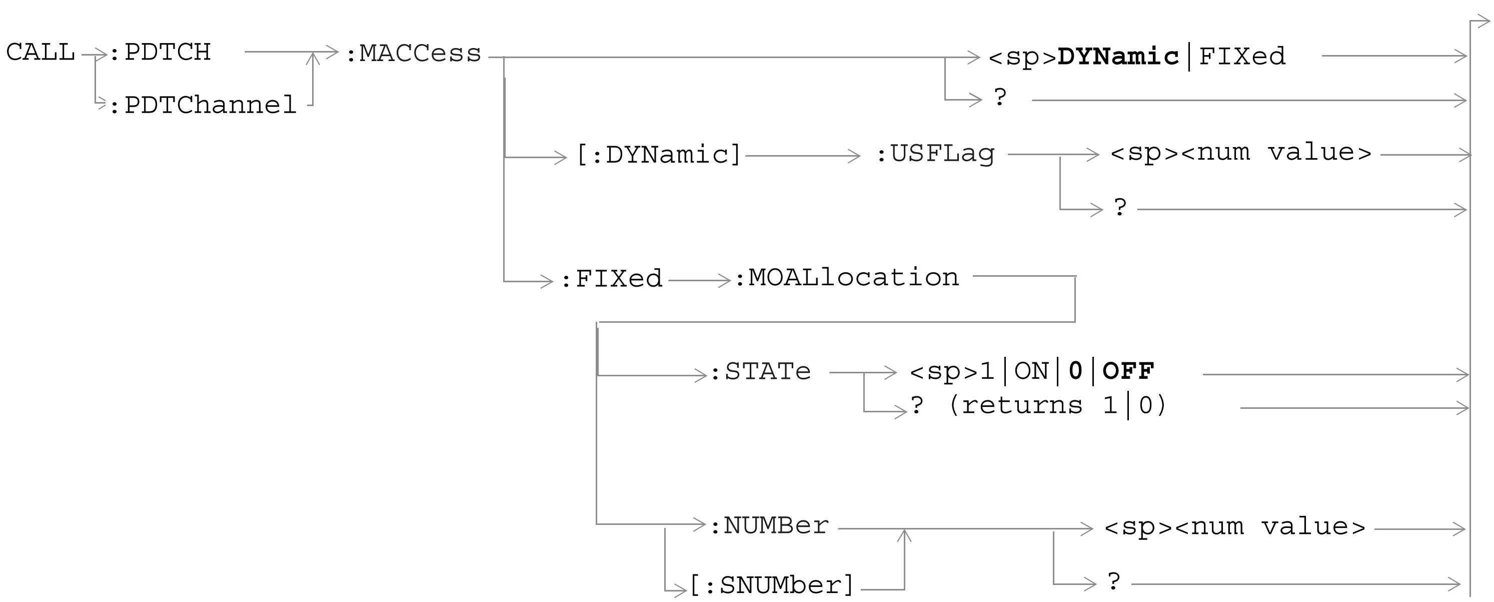



CALL
:PDTCH
:PDTChannel
:MS
:TXLevel
[:SELected]
:DCS
:EGSM
:GSM450
:GSM480
:GSM750
:GSM850
:PCS
:PGSM
:RGSM
:BURSt[**1**|2]
<sp><num value>
?
:MSLot
:CONFiguration
<sp>D1U1|**D2U1**|D2U2|D3U1|D3U2|D4U1
?
[:FIRSt]
:DOWNlink
:LOOPback
[:BURSt]
<sp><num value>
?


CALL
:PDTCH
:PDTChannel
:MS
:TADVance
<sp><num value>
?
[:SELected]
:DCS
:EGSM
:GSM450
:GSM480
:GSM750
:GSM850
:PCS
:PGSM
:RGSM
:CONTinuous
<sp>1|ON|**0**|**OFF**
? (returns 1|0)

CALL:PDTCH|PDTChannel





“Diagram Conventions” on page 160

CALL:PDTCH[:ARFCn][:SELected]
CALL:PDTChannel[:ARFCn][:SELected]

Function	This command sets/queries the ARFCN of the downlink and uplink PDTCH for the band already selected.
Setting	Range: • DCS band, channels 512 to 885 • EGSM band, channels 0 to 124 and 975 to 1023 • GSM450 band, channels 259 to 293 • GSM480 band, channels 306 to 340 • GSM750 band, channels 438 to 511 • GSM850 band, channels 128 to 251 • PCS band, channels 512 to 810 • PGSM band, channels 1 to 124 • RGSM band, channels 0 to 124 and 955 to 1023 Resolution: 1
Query	Range: • DCS band, channels 512 to 885 • EGSM band, channels 0 to 124 and 975 to 1023 • GSM450 band, channels 259 to 293 • GSM480 band, channels 306 to 340 • GSM750 band, channels 438 to 511 • GSM850 band, channels 128 to 251 • PCS band, channels 512 to 810 • PGSM band, channels 1 to 124 • RGSM band, channels 0 to 124 and 955 to 1023 Resolution: 1
*RST setting	PGSM, EGSM and RGSM bands: 30, DCS and PCS bands: 698, GSM450: 280, GSM480: 320, GSM750: 460, GSM850: 160

Programming Example

```
OUTPUT 714;"CALL:PDTCH:ARFCN:SELECTED 512"  !Sets the ARFCN of the selected band to
                                            !512, if 512 is valid for the selected
                                            !band.
```

CALL:PDTCH:BAND

CALL:PDTCH|PDTChannel

CALL:PDTChannel:BAND

Function	This command sets/queries the PDTCH band, therefore constraining the range of PDTCH ARFCNs.
Setting	Range: PGSM|EGSM|GSM450|GSM480|GSM750|GSM850|DCS|PCS|RGSM
Query	Range: PGSM|EGSM|GSM450|GSM480|GSM750|GSM850|DCS|PCS|RGSM
*RST setting	PGSM
Programming Example `OUTPUT 714;"CALL:PDTCH:BAND DCS" !Sets the band to DCS.`	

CALL:PDTCH:CSCHeme
CALL:PDTChannel:CSCHeme

Function	This command sets/queries the PDTCH coding scheme. When you make a coding scheme change, all the measurements and the Block Error Rate (BLER) reports are stopped before the change is made. They are then re-started after the change has taken effect.
Setting	Range: CS1 | CS2| CS3|CS4
Query	Range: CS1 | CS2| CS3|CS4
*RST setting	CS4
Programming Example `OUTPUT 714;"CALL:PDTCHannel:CSCHeme CS1" !Sets the PDTCH coding scheme to CS1.`	

CALL:PDTCH:MACCess
CALL:PDTCHannel:MACCess

Function	Sets the Allocation Mode.
Setting	DYNamic|FIXed
Query	DYN|FIX
*RST setting	DYN

CALL:PDTCH:MACCess[:DYNamic]:USFLag
CALL:PDTCHannel:MACCess[:DYNamic]:USFLag

Function	This command sets/queries the uplink state flag (USF). The USF allows multiple mobile stations to share over-the-air resources.
Setting	Range: 0 to 7 Resolution: 1
Query	Range: 0 to 7 Resolution: 1

*RST setting	0

CALL:PDTCH:MACCess:FIXed:MOALlocation:STATe
CALL:PDTCHannel:MACCess:FIXed:MOALlocation:STATe

Function	Enables the Maximum Octet Allocation.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:PDTCH:MACCess:FIXed:MOALlocation:NUMBer
CALL:PDTCHannel:MACCess:FIXed:MOALlocation:NUMBer

Function	Sets the maximum number of octets to be allocated.
Setting	range 1-9999, step size 10
Query	range 1-9999
*RST setting	1024

CALL:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]
CALL:PDTChannel:MS:TXLevel[:SELected]:BURSt[1|2]

Function	This command selects the mobile station uplink power control level for the band already selected. See "GPRS Frequency Banded Parameters" on page 109. If you do not specify a burst then burst one is assumed.
Setting	Range (all bands): 0 to 31 Resolution (all bands): 1
Query	Range (all bands): 0 to 31 Resolution (all bands): 1
*RST Setting	PGSM, EGSM, RGSM, GSM450, GSM480, GSM750 and GSM850 bands: 15, DCS and PCS bands: 10
Programming Example	

```
OUTPUT 714;"CALL:PDTCH:MS:TXLevel:BURSt 10" !Sets the uplink power level of burst one in the
                                             !selected band to 10.
```

CALL:PDTCH:MS:TADVance[:SELected]
CALL:PDTChannel:MS:TADVance[:SELected]

Function	This command sets/queries the timing advance that is sent to the device under test. This value tells the device how much to offset its transmission to simulate the effects of propagation delays.
Setting	Range (all bands): 0 to 63 Resolution (all bands): 1

Query	Range (all bands): 0 to 63 Resolution (all bands): 1
*RST Setting	0
Programming Example `OUTPUT 714;"CALL:PDTCH:MS:TADVance:PCS 10" !Sets timing advance to 10 for the PCS band.`	

CALL:PDTCH:MS:TADVance:CONTinuous
CALL:PDTChannel:MS:TADVance:CONTinuous

Function	This command sets/queries the continuous timing advance. If this is set to ON, in place of a timing advance value, the DUT is given a timeslot number, and an index value.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	0FF
Programming Example `OUTPUT 714;"CALL:PDTCH:MS:TADVance:CONT 1" !Sets continuous timing advance to ON.`	

CALL:PDTCH:MSLot:CONFiguration
CALL:PDTChannel:MSLot:CONFiguration

Function	This command sets/queries the multislot configuration. The effect this command has on the number of uplink and downlink timeslots depends on the Data Connection Type (see "CALL:FUNCtion:DATA:TYPE" on page 211): • Type A - The multislot configuration command only affects the number of uplink timeslots, therefore configurations D1U1, D2U1, D3U1 and D4U1 will appear similar. • Type B - The multislot configuration command constrains the number of uplink timeslots to be less than or equal to the number of downlink timeslots. • BLER - The multislot configuration command only affects the number of downlink timeslots, therefore D2U2 and D2U1 will appear similar. The actual timeslots used in each configuration are fixed as follows: *Multislot Configuration* / *Downlink Timeslots Used* / *Uplink Timeslots Used* D1U1 / 3 / 3 D2U1 / 3, 4 / 4 D2U2 / 3, 4 / 3, 4 D3U1 / 3, 4, 5 / 4 D3U2 / 3, 4, 5 / 4, 5 D4U1 / 3, 4, 5, 6 / 5 When a multislot configuration change is executed, all measurements will be stopped before the change is made, and re-started after the change has taken effect.
Setting	Range: D1U1 | D2U1 | D2U2 | D3U1 | D3U2 | D4U1
Query	Range: D1U1 | D2U1 | D2U2 | D3U1 | D3U2 | D4U1
*RST Setting	D2U1
Programming Example `OUTPUT 714;"CALL:PDTCH:MSLot:CONFiguration D2U1" !Sets the multislot configuration to be 2 !downlink PDTCHs and 1 uplink PDTCH.`	

CALL:PDTCH:MSLot[:FIRSt]:DOWNlink:LOOPback[:BURSt]
CALL:PDTChannel:MSLot[:FIRSt]:DOWNlink:LOOPback[:BURSt]

Function	This command sets/queries the first downlink burst to be looped back in the first uplink burst. Subsequent downlink bursts are looped back in subsequent uplink bursts. When the operating mode is set to Active Cell, any attempt to change this setting while the data connection state is Transferring and the data connection type is Type B will be rejected. If the multislot configuration is set to a value that has a number of downlink bursts less than the current setting of this parameter, the downlink burst looped back will be determined by the calculation: *(First Downlink Burst to Loop) modulo (current number of downlink bursts)* For example, if the setting of First Downlink Burst to Loop is 4, and the multislot configuration is set to D3U2, then the first downlink burst looped on the uplink will be 1 (4 modulo 3).
Setting	Range: 1 to 4
Query	Range: 1 to 4
*RST Setting	1

Programming Example

```
OUTPUT 714;"CALL:PDTCH:MSLot:DOWNlink:LOOPback 2" ! Sets downlink burst 2 as the first
                                                  ! downlink burst to be looped back.
```

CALL:PDTCH:PMESsage:PPTadvance
CALL:PDTChannel:PMESsage:PPTadvance

Function	This command sets/queries whether or not to send a Packet Power Timing Advance (PPTA) message to the mobile when applying deferred or immediate PDTCH parameters to an active data connection (that is, data connection status is Transferring). Setting this command to On ensures that a PPTA message is sent. If you set this command while the data connection status is Transferring, any changes you make will take effect immediately during the current data connection. This command along with "CALL:PDTCH:PMESsage:PTReconfig" on page 233 provides you with power control settings for mobiles that do not fully support the Packet Timeslot Reconfigure (PTR) message.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	ON

Programming Example

```
OUTPUT 714;"CALL:PDTCH:PMESsage:PPTadvance OFF" !Sets the PPTA message state to ON.
```

CALL:PDTCH:PMESsage:PTReconfig

CALL:PDTChannel:PMESsage:PTReconfig

Function	This command sets/queries whether or not to send a Packet Timeslot Reconfigure (PTR) message to the mobile. Setting this command to: • On, sends a PTR message to the mobile when applying deferred or immediate PDTCH parameters to an active data connection (that is, data connection status is Transferring). • Off, sends an alternative message to the mobile instead of a PTR message. The alternative message that is sent to the mobile depends on the type of data connection (set using "CALL:FUNCtion:DATA:TYPE" on page 211): — If the data connection type is BLER a Packet Downlink Assignment (PDA) message is sent. — If the data connection type is ETSI Type A a Packet Uplink Assignment (PUA) message is sent. — If the data connection type is ETSI Type B, both PDA and PUA messages are sent. If you set this command while the data connection status is Transferring, any changes you make will take effect immediately during the current data connection. This command along with "CALL:PDTCH:PMESsage:PPTadvance" on page 233 provides you with power control settings for mobiles that do not fully support the Packet Timeslot Reconfigure (PTR) message.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	OFF
Programming Example `OUTPUT 714;"CALL:PDTCH:PMESSAGE:PTRECONFIG ON" !Sets the PTR message state to ON.`	

CALL:PDTCH:POWer[:AMPLitude]:BURSt[1|2|3|4]?
CALL:PDTChannel:POWer[:AMPLitude]:BURSt[1|2|3|4]?

Function	This query returns the current absolute power level of the downlink PDTCH burst. The level is calculated from the current BCH Level, current power reduction reference level P0 and the current power reduction level. For more detail on these power levels, refer to "Testing a GPRS Mobile Station" on page 125. If you do not specify a burst then burst one is assumed.
Query	Range: -182.0 to -10.0 dBm and 9.91 E+37 (NAN) Resolution: 0.1 dBm
Programming Example `OUTPUT 714;"CALL:PDTCH:POWer:BURSt?" !Returns current power level of downlink PDTCH !burst 1.`	

CALL:PDTCH:POWer[:AMPLitude]:UBURst?

CALL:PDTChannel:POWer[:AMPLitude]:UBURst?

Function	This query returns the current absolute power level of the unused bursts on the downlink PDTCH ARFCN. The level is calculated from the current BCH Level, current power reduction reference level P0 and the current power reduction level specified for unused bursts. NAN is returned if no power is present on the unused downlink PDTCH ARFCN. For more detail on these power levels, refer to “Testing a GPRS Mobile Station” on page 125.
Query	Range: -182.0 to -10.0 dBm and 9.91 E+37 (NAN) Resolution: 0.1 dBm
Programming Example `OUTPUT 714;"CALL:PDTCH:POWer:UBURst?"`	

CALL:PDTCH:PREDuction:BURSt[1|2|3|4]
CALL:PDTChannel:PREDuction:BURSt[1|2|3|4]

Function	This command sets/queries the power reduction level for any of the downlink bursts. You can define the levels of PRL1 and PRL2 using “CALL:PDTCH:PREDuction:LEVel[1|2]” on page 235. For further information see “Downlink PDTCH Power Control” on page 128. If you do not specify a burst then burst one is assumed.
Setting	Range: PRL1 | PRL2
Query	Range: PRL1 | PRL2
*RST setting	PRL1
Programming Example `OUTPUT 714;"CALL:PDTCH:PRED:BURS PRL1" !Sets the power reduction level of the first burst to !PRL1.`	

CALL:PDTCH:PREDuction:LEVel[1|2]

CALL:PDTChannel:PREDuction:LEVel[1|2]

Function	In GPRS, power levels are referred to as power reduction levels relative to the BCCH. This command sets/queries two power reduction levels. These levels can then be applied to up to four downlink PDTCH bursts using “CALL:PDTCH:PREDuction:BURSt[1|2|3|4]” on page 235. In addition, they can be applied to the unused downlink bursts using “CALL:PDTCH:PREDuction:UBURst” on page 236. For further information see “Downlink PDTCH Power Control” on page 128. If you do not specify a burst then burst one is assumed. **NOTE** If the actual measured difference between two power reduction levels exceeds 20 dB, the test set’s source specifications may no longer be valid. When the Test Set's operating mode is set to GPRS Test Mode BCH+PDTCH and the RLC/MAC Header is turned ON, information is included in the PR field of the RLC/MAC Header to indicate a power reduction level to the mobile. When the Test Set's operating mode is set to GPRS Test Mode BCH+PDTCH and the RLC/MAC Header is turned Off, no information relating to power control is sent to the mobile. (When the operating mode is set to Active Cell the RLC/MAC header containing the PR field is always sent to the mobile.) 3GPP TS 04.60 section 10 Release 1999 defines that a maximum power reduction level of 10 dB can be indicated to the mobile in the PR field of the RLC/MAC header. If your mobile adheres strictly to the standards, and you set this command to a value greater than 10 dB, it is possible your mobile may not respond correctly to the power reduction level you set.
Setting	Range: 0 to 25 dB Resolution: 0.1 dB
Query	Range: 0 to 25 dB Resolution: 0.1 dB
*RST setting	0 dB
Programming Example	

```
OUTPUT 714;”CALL:PDTCH:PRED:LEV2 3” !Sets the second power reduction level (PRL2) to 3 dB.
```

CALL:PDTCH:PREDuction:UBURst
CALL:PDTChannel:PREDuction:UBURst

Function	This command sets/queries the power reduction level for the unused bursts on the downlink PDTCH ARFCN. In addition, it can also be used to turn power reduction off (no power transmitted) for the unused bursts. When this command is set to PRL1 or PRL2, the power reduction level for unused bursts is the value specified using “CALL:PDTCH:PREDuction:LEVel[1|2]” on page 235. Note: In order to make use of power reduction levels, you must set the downlink PDTCHs to be on a different ARFCN from the broadcast channel (BCH). This is because the power level across all timeslots on the BCH must remain constant. Therefore, power reduction levels are ignored if the BCH and PDTCH are on the same ARFCN.

Setting	Range: PRL1 | PRL2 | OFF
Query	Range: PRL1 | PRL2 |OFF
*RST setting	OFF
Programming Example `OUTPUT 714;”CALL:PDTCH:PRED:UBUR PRL2” !Sets the power reduction level of the unused bursts !to PRL2.`	

CALL:PDTCH:PZERo:LEVel

CALL:PDTChannel:PZERo:LEVel

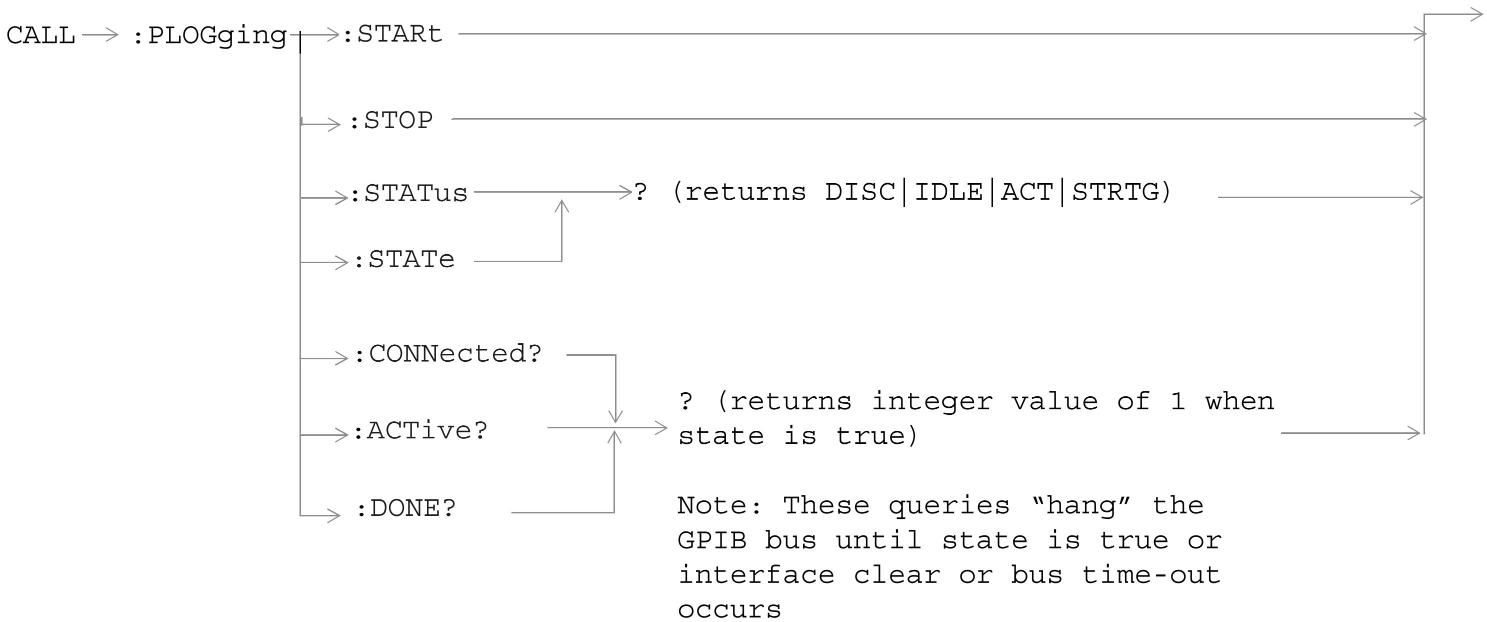
Function	This command sets/queries the power reduction reference level (ETSI refers to this as P0) for downlink PDTCH power control. For further information see “Downlink PDTCH Power Control” on page 128.
Setting	Range: 0 to 30 dB Resolution: 2 dB
Query	Range: 0 to 30 dB Resolution: 2 dB
*RST setting	0 dB
Programming Example `OUTPUT 714;”CALL:PDTCH:PZERo:LEVel 30” !Sets the power reduction reference level (P0) to !30 dB.`	

CALL:PDTCH:USFBler?

CALL:PDTCHannel:USFBler?

Function	Enables the USF BLER measurement report and returns the USF BLER value first, then the number of blocks that USF BLER was calculated over.
Query	Range: USF BLER value: 0 to 100%, or NAN, Number of Blocks: 0 to 100,000, or NAN
Programming Example `OUTPUT 714;”CALL:PDTCH:USFB?”`	

CALL:PLOGging



"Diagram Conventions" on page 160

CALL:PLOGging:ACTive?

Function	This query returns an integer value of 1 if the status of the test set's protocol logging data source is: • ACT (Active) - Both a real-time session and a logging session have been established and data is being captured by the protocol logging software. If the state of the test set's protocol logging data source is not Active, this query will "hang" until a transition to the Active state occurs, or a bus time-out or device clear terminates the query attempt.
Query	Range: 1
Programming Example `OUTPUT 714;"CALL:PLOGGING:ACT?"!Queries the Active state.`	

CALL:PLOGging:CONNected?

Function	This query returns an integer value of 1 if the status of the test set's protocol logging data source is either: • IDLE - A real-time protocol logging session has been established between the test set and the protocol logging software, but protocol logging is not currently taking place. • ACT (Active) - Both a real-time session and a logging session have been established and data is being captured by the protocol logging software. If the state of the test set's protocol logging data source is not one of the above, this query will "hang" until a transition to one of these states occurs, or a bus time-out or device clear terminates the query attempt.
Query	Range: 1
Programming Example `OUTPUT 714;"CALL:PLOGGING:CONN?"!Queries the connected state.`	

CALL:PLOGging:DONE?

Function	This query returns an integer value of 1 if the status of the test set's protocol logging data source is either: • DISC (Disconnected) - There is no real-time protocol logging session established between the test set and the protocol logging software. • IDLE - A real-time protocol logging session has been established between the test set and the protocol logging software, but protocol logging is not currently taking place. If the state of the test set's protocol logging data source is not one of the above, this query will "hang" until a transition to one of these states occurs, or a bus time-out or device clear terminates the query attempt.
Query	Range: 1
Programming Example `OUTPUT 714;"CALL:PLOGGING:DONE?"!Queries the done (logging) state.`	

CALL:PLOGging:STARt

Function	This command starts protocol logging.
Programming Example OUTPUT 714;"CALL:PLOGGING:START" !Starts protocol logging.	

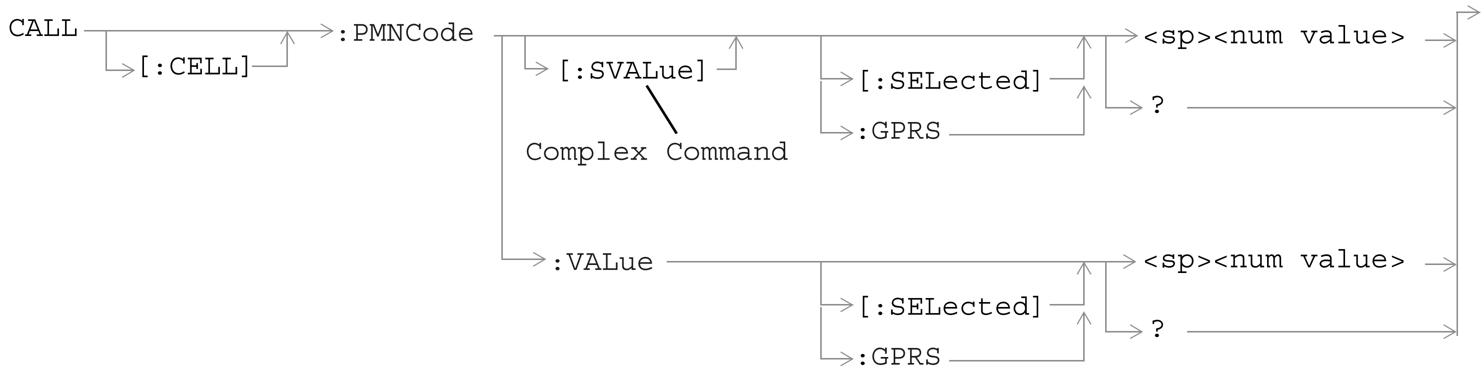
CALL:PLOGging:STATus? *or* CALL:PLOGging:STATe?

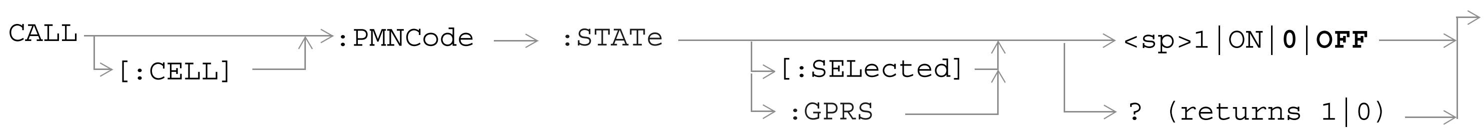
Function	This command queries the protocol logging status (idle or active).
Query	Range: IDLE | ACT
*RST Setting	IDLE
Programming Example OUTPUT 714;"CALL:PLOGGING:STATE?" ENTER 714;variable_name$	

CALL:PLOGging:STOP

Function	This command stops protocol logging.
Programming Example OUTPUT 714;"CALL:PLOGGING:STOP"	

CALL:PMNCode





“Diagram Conventions” on page 160

CALL:PMNCode

CALL[:CELL]:PMNCode[:SVALue][:SELected]

Function	This command sets/queries the 3 digit mobile network code. This command is used for the PCS band only. This command sets the PMNCode state to ON for the active (that is the selected) format.
Setting	Range: 0 to 999 Resolution: 1
Query	Range: 0 to 999 Resolution: 1
*RST Setting	1
Programming Example `OUTPUT 714;"CALL:CELL:PMNCODE:SVALUE:SELECTED 798"` `!Sets the value to 798 and the state to ON. Only used for PCS 1900 band.`	

CALL[:CELL]:PMNCode[:SVALue]:GPRS

Function	This command sets/queries the 3 digit mobile network code. This command is used for the PCS band only. This command sets the PMNCode state to ON for the GPRS format.
Setting	Range: 0 to 999 Resolution: 1
Query	Range: 0 to 999 Resolution: 1
*RST Setting	1
Programming Example `OUTPUT 714;"CALL:CELL:PMNCODE:SVALUE:GPRS 798"` `!Sets the value to 798 and the state to ON. Only used for PCS 1900 band.`	

CALL[:CELL]:PMNCode:VALue[:SELected]

Function	This command sets/queries the 3 digit mobile network code value for the active (that is the selected) format. This command is used for PCS band only.
Setting	Range: 0 to 999 Resolution: 1
Query	Range: 0 to 999 Resolution: 1
*RST Setting	1

Programming Example
OUTPUT 714;"CALL:CELL:PMNCODE:VALUE:SELECTED 798"
!Sets the 3 digit MNCode for PCS 1900 to 798.

CALL[:CELL]:PMNCode:VALue:GPRS

Function	This command sets/queries the 3 digit mobile network code value for the GPRS format. This command is used for PCS band only.
Setting	Range: 0 to 999 Resolution: 1
Query	Range: 0 to 999 Resolution: 1
*RST Setting	1
Programming Example OUTPUT 714;"CALL:CELL:PMNCODE:VALUE:GPRS 798" !Sets the 3 digit MNCode for PCS 1900 to 798.	

CALL[:CELL]:PMNCode:STATe[:SELected]

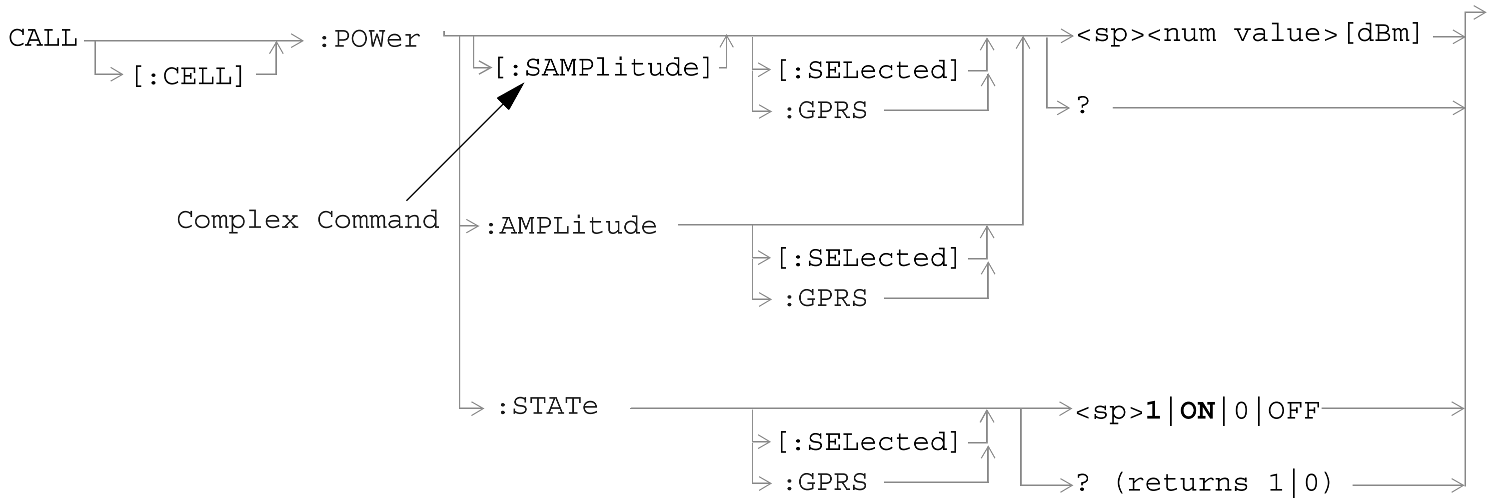
Function	This command sets/queries the MNC state in the active (that is the selected) format. This command is used for the PCS band only. Setting it to ON configures the BCCH to use the 3 digit MNC. Note this command can only be used when the Cell Operating Mode is OFF
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.
Programming Example OUTPUT 714;"CALL:CELL:PMNCode:STATe ON" !Enables the 3 digit MNCode for PCS 1900.	

CALL[:CELL]:PMNCode:STATe:GPRS

Function	This command sets/queries the MNC state in the GPRS format whether or not that format is active. This command is used for the PCS band only. Setting it to ON configures the BCCH to use the 3 digit MNC. Note, this command can only be used when the Cell Operating Mode is OFF.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	0|OFF

Programming Example
`OUTPUT 714;"CALL:CELL:PMNCode:STATe:GPRS ON" !Enables the 3 digit MNCode for PCS 1900.`

CALL:POWer



"Diagram Conventions" on page 160

CALL[:CELL]:POWer[:SAMPlitude][:SELected]

Function	This command sets/queries the Cell Power for the active (that is the selected) format. This is a complex command combining the cell power state and amplitude commands. The cell power state is automatically set to ON when this command is used. The suffix dBm is optional. The power level of the PDTCH is also affected by the setting of this command. However, the PDTCH level is also affected by other settings (see “Configuring the Packet Data Traffic Channel (PDTCH)” on page 106). The Cell Power is affected when there is an amplitude offset (see “Amplitude Offset” on page 433).
Setting	Range: -10 dBm to -127 dBm Resolution: .01 dBm
Query	Range: -10 dBm to -127 dBm Resolution: .01 dBm
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.

Programming Example

```
OUTPUT 714;”CALL:CELL:POWer:SAMPlitude:SELected -50dBm” !Sets the value to -50dBm
                                                        ! and the state to ON.
```

CALL[:CELL]:POWer[:SAMPlitude]:GPRS

Function	This command sets/queries the Cell Power for the GPRS format whether or not that format is active. This is a complex command combining the cell power state and amplitude commands. The cell power state is automatically set to ON when this command is used. The suffix dBm is optional. The Cell Power is affected when there is an amplitude offset (see “Amplitude Offset” on page 433).
Setting	Range: -10 dBm to -127 dBm Resolution: .01 dBm
Query	Range: -10 dBm to -127 dBm Resolution: .01 dBm
*RST Setting	-85 dBm

Programming Example

```
OUTPUT 714;”CALL:CELL:POWer:SAMPlitude:GPRS -50dBm” !Sets the value to -50dBm
                                                    !and the state to ON.
```

CALL[:CELL]:POWer:AMPLitude[:SELected]

Function	This command sets/queries the Cell Power (BCH) for the active (that is the selected) format. The suffix dBm is optional. The power level of the PDTCH is also affected by the setting of this command. However, the PDTCH level is also affected by other settings (see "Configuring the Packet Data Traffic Channel (PDTCH)" on page 106). The Cell Power is affected when there is an amplitude offset (see "Amplitude Offset" on page 433).
Setting	Range: -10 dBm to -127 dBm Resolution: .01 dBm
Query	Range: -10 dBm to -127 dBm Resolution: .01dBm
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.

Programming Example

```
OUTPUT 714;"CALL:CELL:POWer:AMPLitude:SELected -50dBm" !Set the cell power from test
                                                       !set to -50dBm.
```

CALL[:CELL]:POWer:AMPLitude:GPRS

Function	This command sets/queries the Cell Power for the GPRS format whether or not that format is active. The suffix dBm is optional. The Cell Power is affected when there is an amplitude offset (see "Amplitude Offset" on page 433).
Setting	Range: -10 dBm to -127 dBm Resolution: .01 dBm
Query	Range: -10 dBm to -127 dBm Resolution: .01dBm
*RST Setting	-85 dBm

Programming Example

```
OUTPUT 714;"CALL:CELL:POWer:AMPLitude:GPRS -50dBm" !Set the cell power from test
                                                   !set to -50dBm.
```

CALL[:CELL]:POWer:STATe[:SELected]

Function	This command sets/queries the Cell Power state for the active (that is the selected) format. When set to 1|ON, the RF power for the cell is turned on.
Setting	Range: 0 | OFF | 1 | ON

Query	Range: 0 | 1
*RST Setting	The *RST value of this command depends on the format that is currently active. For example, if the GPRS format is currently active, the *RST value for this command is the same value as the equivalent command containing the :GPRS format identifier.
Programming Example `OUTPUT 714;"CALL:CELL:POWer:STATe:SELected 1" !Sets the cell power state to ON.`	

CALL[:CELL]:POWer:STATe:GPRS

Function	This command sets/queries the Cell Power state in the GPRS format whether or not that format is active. When set to 1|0, the RF power for the cell is turned on.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST Setting	ON
Programming Example `OUTPUT 714;"CALL:CELL:POWer:STATe:GPRS 1" !Sets the cell power state to ON.`	

CALL:PPRocedure

```
CALL → :PPRocedure → :ATTach → :ACCept → :IAReject → :GMMCause<sp><num value>
                              → :REJect              → :STATe<sp>0|OFF|1|ON

CALL → :PPRocedure → :DETach → :REQuest → :GMMCause<sp><num value>
                                        → [:IMMediate]

CALL → :PPRocedure → :IDEntity → :REQuest → :TYPe<sp>IMSI|IMEI|IMEISV|TMSI
                                          → [:IMMediate]
                                          → :RESult?
                                          → :RESult:CLEar

CALL → :PPRocedure → :PDPContext → :AACCept → :QOService → :RCLass
                                   → :SUBScribed<sp><num value>
                                   → :ENForce → :STATe<sp>0|OFF|1|ON
                                              → :VALUe<sp><num value>
                                              → [:SVALUe]<sp><num value>

CALL → :PPRocedure → :PDPContext → :AREJect → :SMCause<sp><num value>
                                            → :STATe<sp>0|OFF|1|ON
```

“Diagram Conventions” on page 160

CALL:PPRocedure:ATTach:ACCept:IAReject:GMMCause

Function	Sets the GMM Cause for Rejecting IMSI attach for non-GPRS services.
Setting	Range: 0 to 255 (decimal)
Query	Range: 0 to 255
*RST setting	111

CALL:PPRocedure:ATTach:ACCept:IAReject:STATe

Function	Sets/Queries IMSI attach accept state.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST setting	

CALL:PPRocedure:ATTach:REJect:GMMCause

Function	Sets the GMM Cause for rejecting IMSI attach.
Setting	Range: 0 to 255 (decimal)
Query	Range: 0 to 255
*RST setting	111

CALL:PPRocedure:ATTach:REJect:STATe

Function	Sets/Queries IMSI attach reject state.
Setting	Range: 0 | OFF | 1 | ON
Query	Range: 0 | 1
*RST setting	

CALL:PPRocedure:DETach:REQuest:GMMCause

Function	Sets the GMM Cause for Rejecting the detach request.
Setting	Range: 0 to 255 (decimal)
Query	Range: 0 to 255
*RST setting	111

CALL:PPRocedure:DETach:REQuest[:IMMediate]

Function	Sends detach request.

CALL:PPRocedure:IDENtity:REQuest[:IMMediate]

Function	Sends identity request.

CALL:PPRocedure:IDENtity:REQuest:RESults?]

Function	Queries identity results and returns four string values for IMSI, IMEI, IMEISV, TMSI in order.

CALL:PPRocedure:IDENtity:REQuest:RESults:CLEar]

Function	Clears identity results.

CALL:PPRocedure:IDENtity:REQuest:TYPE

Function	Sets/Queries the Identity to Request.
Setting	IMSI|IMEI|IMEISI|TMSI
Query	IMSI|IMEI|IMEISI|TMSI
*RST Setting	IMSI

CALL:PPRocedure:PDPContext:AACCept:QOService:RCLass:SUBScribed

Function	Activates PDP Context Accept QOS Subscribed Reliability Class which represents Quality of Service Reliability Class that will be supplied to the DUT if it requests its subscribed value. See GSM 05.08 for specific values. Some values are listed below
Query	Range: 1-5. See following table for details.

Table 13. Activate PDP Context Accept QoS Subscribed Reliability Class Range

Value	Reliability Class
1	Ack GTP, LLC, RLC;Protected Data
2	Unack GTP, ack LLC, RLC;Protected Data
3	Unack GTP, LLC, ack RLC;Protected Data
4	Unack GTP, LLC, RLC;Protected Data
5	Unack GTP, LLC, RLC;Unprotected Data

CALL:PPRocedure:PDPContext:AACCept:QOService:RCLass:ENForce:STATe

Function	Sets/Queries the PDP Context Accept Override Requested Reliability Class State.
Setting	Range: 0|OFF|1|ON
Query	Range: 0|1
*RST setting	

CALL:PPRocedure:PDPContext:AACCept:QOService:RCLass:ENForce[:SVALue]

Function	Sets/Queries the PDP Context Accept Override Reliability Class state and value.
Query	Range: 1-5. Same as the following command values.

CALL:PPRocedure:PDPContext:AACCept:QOService:RCLass:ENForce:VALue

Function	Sets/Queries the PDP Context Accept Override Reliability Class Value which represents Quality of Service Reliability Class that will be supplied to the DUT when the Override Requested Reliability Class State is set to ON. See GSM 04.08 for specific values. The values are listed below.
Query	Range: 1-5. See following table for details.

Table 14. Activate PDP Context Accept Override Reliability Class Value Range

Value	Reliability Class to Override with
1	Ack GTP, LLC, RLC;Protected Data
2	Unack GTP, ack LLC, RLC;Protected Data
3	Unack GTP, LLC, ack RLC;Protected Data
4	Unack GTP, LLC, RLC;Protected Data
5	Unack GTP, LLC, RLC;Unprotected Data

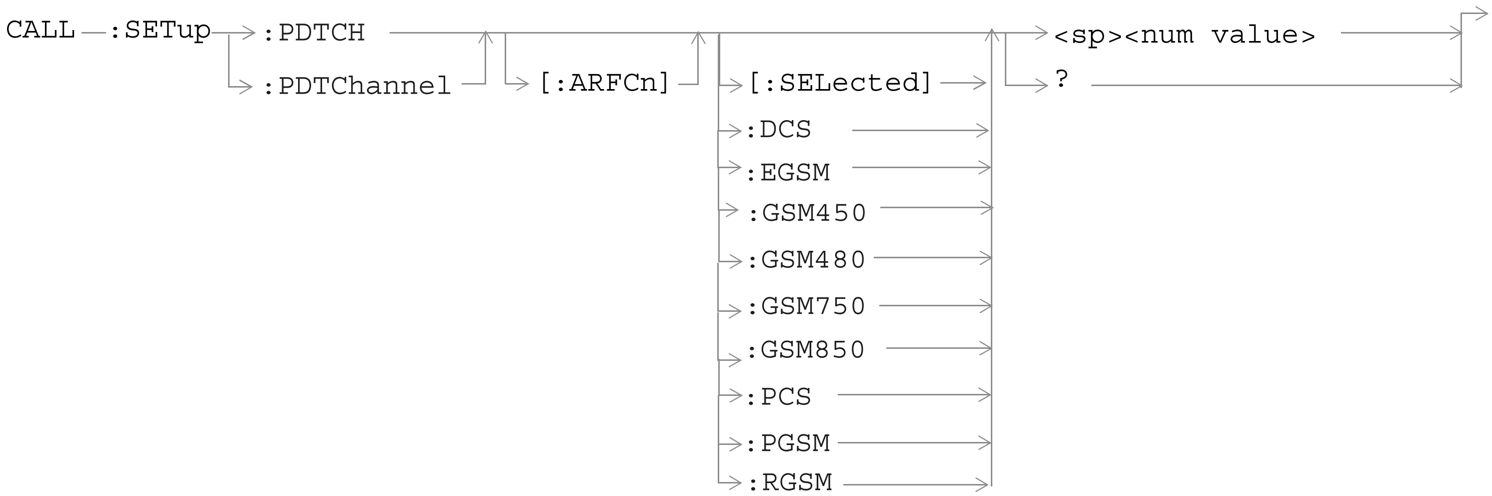
CALL:PPRocedure:PDPContext:AREJect:SMCause

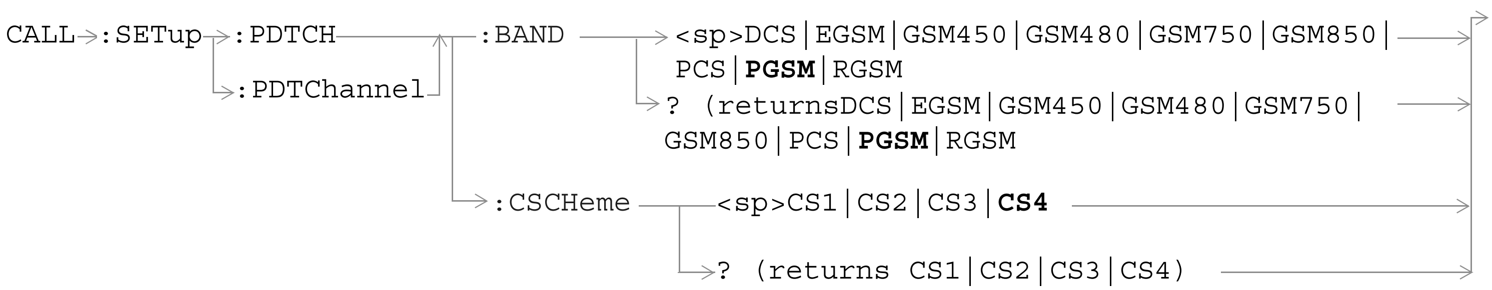
Function	Sets/Queries the SM Cause for Rejecting PDP Context.
Setting	Range: 0 to 255 (decimal)
Query	Range: 0 to 255
*RST setting	111

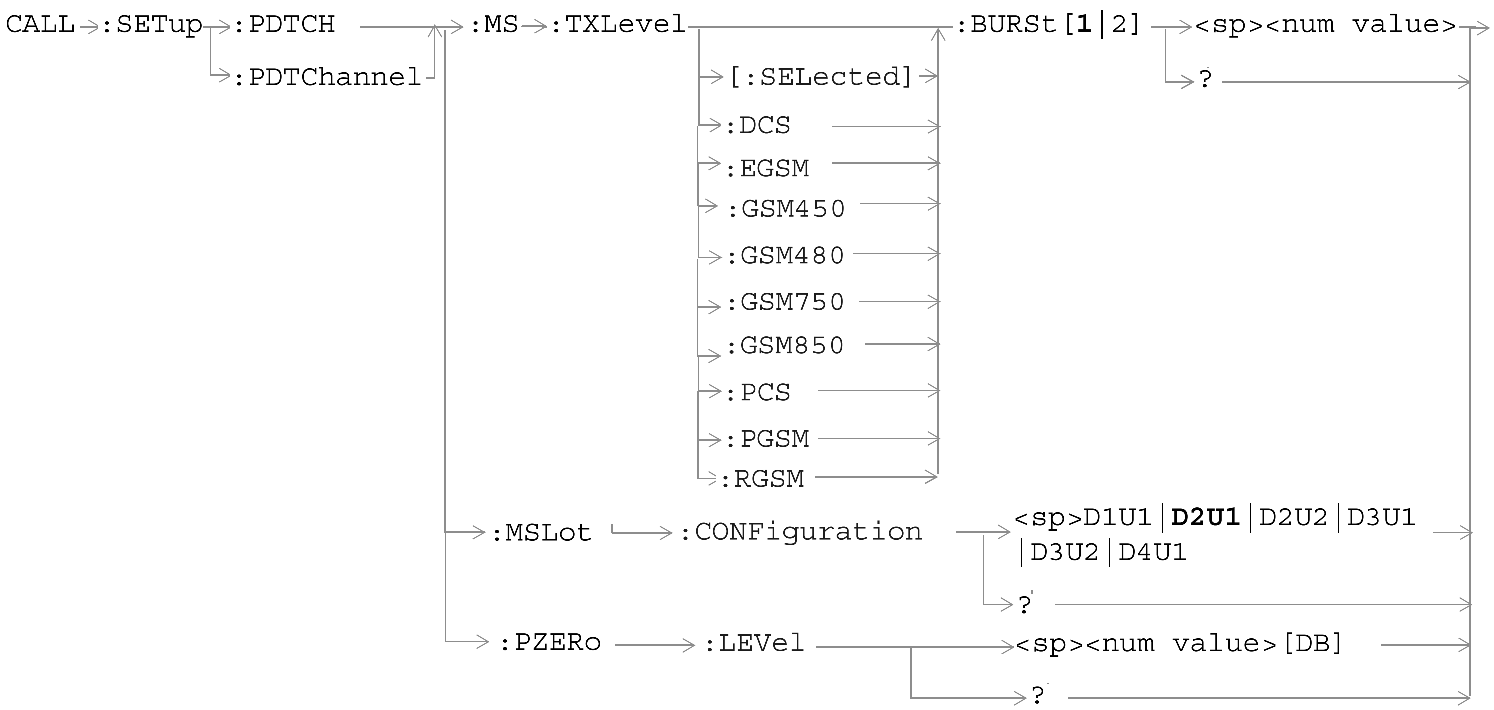
CALL:PPRocedure:PDPContext:AREJect:STATe

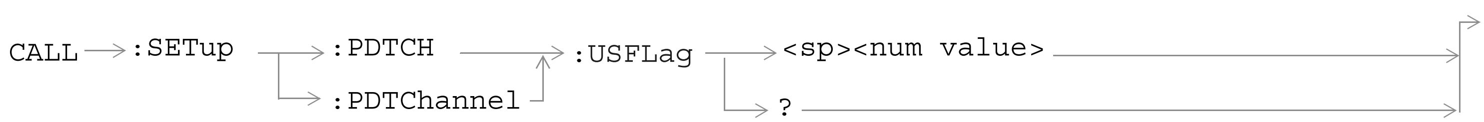
Function	Sets/Queries the PDP Context Reject state.
Setting	Range: 0|OFF|1|ON
Query	Range: 0|1
*RST setting	

CALL:SETup


CALL
:SETup
:PDTCH
:PDTChannel
[:ARFCn]
[:SELected]
:DCS
:EGSM
:GSM450
:GSM480
:GSM750
:GSM850
:PCS
:PGSM
:RGSM
<sp><num value>
?


CALL
:SETup
:PDTCH
:PDTChannel
:BAND
<sp>DCS|EGSM|GSM450|GSM480|GSM750|GSM850|
PCS|PGSM|RGSM
? (returnsDCS|EGSM|GSM450|GSM480|GSM750|
GSM850|PCS|PGSM|RGSM
:CSCHeme
<sp>CS1|CS2|CS3|CS4
? (returns CS1|CS2|CS3|CS4)





“Diagram Conventions” on page 160

CALL:SETup:PDTCH[:ARFCn][:SELected]
CALL:SETup:PDTChannel[:ARFCn][:SELected]

Function	This command sets/queries the deferred PDTCH ARFCN for the band specified using the command "CALL:SETup:PDTCH:BAND" on page 260. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. The correspondence between ARFCN and frequency differs for each band and that a single ARFCN specifies a separate frequency for uplink and downlink. The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: • DCS band, channels 512 to 885 • EGSM band, channels 0 to 124 and 975 to 1023 • PCS band, channels 512 to 810 • PGSM band, channels 1 to 124 • RGSM band, channels 0 to 124 and 955 to 1023 • GSM450 band, channels 259 to 293 • GSM480 band, channels 306 to 340 • GSM750 band, channels 438 to 511 • GSM850 band, channels 128 to 251 Resolution: 1
Query	Range: • DCS band, channels 512 to 885 • EGSM band, channels 0 to 124 and 975 to 1023 • PCS band, channels 512 to 810 • PGSM band, channels 1 to 124 • RGSM band, channels 0 to 124 and 955 to 1023 • GSM450 band, channels 259 to 293 • GSM480 band, channels 306 to 340 • GSM750 band, channels 438 to 511 • GSM850 band, channels 128 to 251 Resolution: 1
*RST setting	PGSM, EGSM and RGSM bands: 30, DCS and PCS bands: 698, GSM450 band: 280, GSM480 band: 320, GSM750 band: 460, GSM850 band: 160

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH 515"  !Sets the ARFCN to 515 if it is
                                   !appropriate in the current band.
```

CALL:SETup:PDTCH[:ARFCn]:DCS

CALL:SETup:PDTChannel[:ARFCn]:DCS

Function	This command sets/queries the deferred PDTCH ARFCN within the DCS band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN (and thus carrier frequency) for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 512 to 885 Resolution: 1
Query	Range: 512 to 885 Resolution: 1
*RST setting	698
Programming Example	
`OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:DCS 600 !Sets the ARFCN to 600 in the DCS band.`	

CALL:SETup:PDTCH[:ARFCn]:EGSM
CALL:SETup:PDTChannel[:ARFCn]:EGSM

Function	This command sets/queries the deferred PDTCH ARFCN within the EGSM band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 0 to 124 | 975 to 1023 Resolution: 1
Query	Range: 0 to 124 | 975 to 1023 Resolution: 1
*RST setting	30
Programming Example	
`OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:EGSM 987" !Sets the ARFCN to 987 in the EGSM band.`	

CALL:SETup:PDTCH[:ARFCn]:GSM450
CALL:SETup:PDTChannel[:ARFCn]:GSM450

Function	This command sets/queries the deferred PDTCH ARFCN within the GSM450 band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 259 to 293 Resolution: 1
Query	Range: 259 to 293 Resolution: 1
*RST setting	280
Programming Example	

```
OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:GSM450 270" !Sets the ARFCN to 270 in the GSM450 band.
```

CALL:SETup:PDTCH[:ARFCn]:GSM480
CALL:SETup:PDTChannel[:ARFCn]:GSM480

Function	This command sets/queries the deferred PDTCH ARFCN within the GSM480 band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 306 to 340 Resolution: 1
Query	Range: 306 to 340 Resolution: 1
*RST setting	320
Programming Example	

```
OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:GSM480 310" !Sets the ARFCN to 310 in the GSM480 band.
```

CALL:SETup:PDTCH[:ARFCn]:GSM750
CALL:SETup:PDTChannel[:ARFCn]:GSM750

Function	This command sets/queries the deferred PDTCH ARFCN within the GSM750 band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 438 to 511 Resolution: 1
Query	Range: 438 to 511 Resolution: 1
*RST setting	460
Programming Example `OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:GSM750 500" !Sets the ARFCN to 500 in the GSM750 band.`	

CALL:SETup:PDTCH[:ARFCn]:GSM850
CALL:SETup:PDTChannel[:ARFCn]:GSM850

Function	This command sets/queries the deferred PDTCH ARFCN within the GSM850 band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 128 to 251 Resolution: 1
Query	Range: 128 to 251 Resolution: 1
*RST setting	160
Programming Example `OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:GSM850 230" !Sets the ARFCN to 230 in the GSM850 band.`	

CALL:SETup:PDTCH[:ARFCn]:PCS
CALL:SETup:PDTChannel[:ARFCn]:PCS

Function	This command sets/queries the deferred PDTCH ARFCN within the PCS band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN (and thus carrier frequency) for all the PDTCHs you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 512 to 810 Resolution: 1
Query	Range: 512 to 810 Resolution: 1
*RST setting	698
Programming Example	

```
OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:PCS 608" !Sets the ARFCN to 608 in the PCS band.
```

CALL:SETup:PDTCH[:ARFCn]:PGSM
CALL:SETup:PDTChannel[:ARFCn]:PGSM

Function	This command sets/queries the deferred PDTCH ARFCN within the PGSM band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 1 to 124 Resolution: 1
Query	Range: 1 to 124 Resolution: 1
*RST setting	30
Programming Example	

```
OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:PGSM 44" !Sets the ARFCN to 44 in the PGSM band.
```

CALL:SETup:PDTCH[:ARFCn]:RGSM
CALL:SETup:PDTChannel[:ARFCn]:RGSM

Function	This command sets/queries the deferred PDTCH ARFCN within the RGSM band when selected. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). The ARFCN range varies with the selected PDTCH band. A single ARFCN specifies a separate frequency for uplink and downlink The PDTCH ARFCN selects the ARFCN for all the PDTCHs which you can configure. The PDTCH ARFCN is a frequency banded parameter. Refer to "Frequency Banded Parameters" on page 109 for a detailed description of the implications of being a banded parameter.
Setting	Range: 0 to 124 | 955 to 1023 Resolution: 1
Query	Range: 0 to 124 | 955 to 1023 Resolution: 1
*RST setting	30
Programming Example `OUTPUT 714;"CALL:SETup:PDTCH:ARFCn:RGSM 100" !Sets the ARFCN to 100 in the RGSM band.`	

CALL:SETup:PDTCH:BAND
CALL:SETup:PDTChannel:BAND

Function	This command sets/queries the deferred GSM band. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212).
Setting	Range: PGSM | EGSM | GSM450 | GSM480 | GSM750 | GSM850 | DCS | PCS | RGSM
Query	Range: PGSM | EGSM | GSM450 | GSM480 | GSM750 | GSM850 | DCS | PCS | RGSM
*RST setting	PGSM
Programming Example `OUTPUT 714;"CALL:SETup:PDTCH:BAND DCS" !Sets the deferred band to DCS`	

CALL:SETup:PDTCH:CSCHeme
CALL:SETup:PDTChannel:CSCHeme

Function	This command sets/queries the deferred PDTCH coding scheme. Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see "CALL:HANDover | HANDoff[:IMMediate]" on page 212). When a Coding Scheme change is executed, all measurements and BLER reports are stopped before the change is made, and re-started after the change has taken effect.

Setting	Range: CS1 | CS2|CS3|CS4
Query	Range: CS1 | CS2|CS3|CS4
*RST setting	CS4
Programming Example `OUTPUT 714;"CALL:SETup:PDTCH:CSCHeme CS4" !Sets the PDTCH deferred coding scheme to CS4`	

CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel[:SELected]:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the deferred PDTCH band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	PGSM, EGSM RGSM, GSM450, GSM480, GSM750 and GSM850 bands:15, DCS and PCS bands: 10

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:BURSt2 13"! Sets the deferred mobile station TX
                                                  !level for the 2nd uplink burst in
                                                  !the currently selected band.
```

CALL:SETup:PDTCH:MS:TXLevel:DCS:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:DCS:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the DCS band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1

Query	Range: 0 to 31 Resolution: 1
*RST setting	10

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:DCS:BURST1 13"  !Sets the deferred mobile station
                                                        !TX level for the 1st uplink
                                                        !burst to 13 in the DCS band.
```

CALL:SETup:PDTCH:MS:TXLevel:EGSM:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:EGSM:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the EGSM band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:EGSM:BURSt1 19"! Sets the deferred mobile
                                                       !station TX level for the 1st
                                                       !uplink burst to 19 in the EGSM
                                                       !band.
```

CALL:SETup:PDTCH:MS:TXLevel:GSM450:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:GSM450:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the GSM450 band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.

Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:GSM450:BURSt1 6"! Sets the deferred mobile
                                                    !station TX level for the 1st
                                                    !uplink burst to 6 in the GSM450
                                                    !band.
```

CALL:SETup:PDTCH:MS:TXLevel:GSM480:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:GSM480:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the GSM480 band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:GSM480:BURSt1 19"! Sets the deferred mobile
                                                    !station TX level for the 1st
                                                    !uplink burst to 19 in the GSM480
                                                    !band.
```

CALL:SETup:PDTCH:MS:TXLevel:GSM750:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:GSM750:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the GSM750 band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.

Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:GSM750:BURSt1 6"! Sets the deferred mobile
                                                    !station TX level for the 1st
                                                    !uplink burst to 6 in the GSM750
                                                    !band.
```

CALL:SETup:PDTCH:MS:TXLevel:GSM850:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:GSM850:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the GSM850 band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:GSM850:BURSt1 6"! Sets the deferred mobile
                                                        !station TX level for the 1st
                                                        !uplink burst to 6 in the GSM850
                                                        !band.
```

CALL:SETup:PDTCH:MS:TXLevel:PCS:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:PCS:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the PCS band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1

Query	Range: 0 to 31 Resolution: 1
*RST setting	10
Programming Example	

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:PCS:BURST2 12"  !Sets the deferred mobile station
                                                        !TX Level for the 2nd uplink
                                                        !burst to 12 in the PCS band.
```

CALL:SETup:PDTCH:MS:TXLevel:PGSM:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:PGSM:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the PGSM band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1
Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:PGSM:BURSt2 21" !Sets the deferred mobile
                                                       !station TX Level for the 2nd
                                                       !uplink burst to 21 in the PGSM
                                                       !band.
```

CALL:SETup:PDTCH:MS:TXLevel:RGSM:BURSt[1|2]
CALL:SETup:PDTChannel:MS:TXLevel:RGSM:BURSt[1|2]

Function	This command sets/queries the deferred mobile station transmit power level for the RGSM band. The transmit power is set individually for each uplink burst. Depending on the “Multislot Configuration” setting, there will be either one or two uplink bursts (burst 1 and burst 2) - burst 1 is in the first uplink slot specified, not timeslot 1, similarly burst 2 is in the second slot specified, not timeslot 2 (see “CALL:SETup:PDTCH:MS:TXLevel[:SELected]:BURSt[1|2]” on page 262). Deferred parameters are applied when a channel change is executed using the CALL:HANDover command (see “CALL:HANDover | HANDoff[:IMMediate]” on page 212). The mobile station transmit power level is a frequency banded parameter. Refer to “Frequency Banded Parameters” on page 109 for a detailed description of the implications of being a banded parameter. The mobile station transmit power level is a bursted parameter. Refer to “Bursted Parameters” on page 112 for a detailed description of being a bursted parameter.
Setting	Range: 0 to 31 Resolution: 1

Query	Range: 0 to 31 Resolution: 1
*RST setting	15

Programming Example

```
OUTPUT 714;"CALL:SETup:PDTCH:MS:TXLevel:RGSM:BURSt2 21" !Sets the deferred mobile
                                                       !station TX Level for the 2nd
                                                       !uplink burst to 21 in the RGSM
                                                       !band.
```

CALL:SETup:PDTCH:MSLot:CONFiguration
CALL:SETup:PDTChannel:MSLot:CONFiguration

<table>
<tr><td>Function</td><td>
This command sets/queries the deferred number of downlink and uplink PDTCHs. These deferred PDTCHs are only applied when the Execute Channel Change action is initiated using “CALL:HANDover | HANDoff[:IMMediate]” on page 212.
The effect this command has on the number of uplink and downlink timeslots depends on the Data Connection Type:

Type A - The multislot configuration command only affects the number of uplink timeslots, therefore configurations D1U1, D2U1, D3U1, and D4U1 will appear similar.
Type B - The multislot configuration command constrains the number of uplink timeslots to be less than or equal to the number of downlink timeslots.
BLER - The multislot configuration command only affects the number of downlink timeslots, therefore D2U2 and D2U1 will appear similar.

The actual timeslots used in each configuration are fixed as follows:
<table>
<tr><th>Multislot Configuration</th><th>Downlink Timeslots Used</th><th>Uplink Timeslots Used</th></tr>
<tr><td>D1U1</td><td>3</td><td>3</td></tr>
<tr><td>D2U1</td><td>3, 4</td><td>4</td></tr>
<tr><td>D2U2</td><td>3, 4</td><td>3, 4</td></tr>
<tr><td>D3U1</td><td>3, 4, 5</td><td>4</td></tr>
<tr><td>D3U2</td><td>3, 4, 5</td><td>4, 5</td></tr>
<tr><td>D4U1</td><td>3, 4, 5, 6</td><td>5</td></tr>
</table>
When the Multislot Configuration is set to D1U1, D2U1, D3U1 or D4U1 the measurement burst is set to 1.
When a multislot configuration change is executed, all measurements are stopped before the change is made, and restarted after the change has taken effect.
</td></tr>
<tr><td>Setting</td><td>
D1U1|D2U1|D2U2|D3U1|D3U2|D4U1
“D<n>U<m>” corresponds to “Downlink<n>Uplink<m>”, where <n> indicates the number of downlink timeslots and <m> represents the number of uplink timeslots.
</td></tr>
<tr><td>Query</td><td>Range: D1U1 | D2U1 | D2U2 | D3U1|D3U2|D4U1</td></tr>
<tr><td>*RST Setting</td><td>D2U1</td></tr>
<tr><td colspan="2">
Programming Example
<pre>
OUTPUT 714;"CALL:SETup:PDTCH:MSLot:CONFiguration D2U2" !Sets the number of downlink
                                                       !timeslots to 2 and uplink
                                                       !timeslots to 2.
</pre>
</td></tr>
</table>

CALL:SETup:PDTCH:PZERo:LEVel

CALL:SETup:PDTChannel:PZERo:LEVel

Function	This command sets/queries the deferred Power Reduction reference level to be used for connections. Deferred parameters are applied when the Execute Channel Change action is initiated using "CALL:HANDover | HANDoff[:IMMediate]" on page 212. When Data Connection Type "ETSI Type A" is used, there is no downlink PDTCH and therefore changing this parameter has no effect other than remembering the new value until the Data Connection Type "ETSI Type B" or "BLER" is used.
Setting	Range: 0 to 30 dB Resolution: 2 dB
Query	Range: 0 to 30 dB Resolution: 2 dB
*RST setting	0 dB
Programming Example	

```
OUTPUT 714;"CALL:SETup:PDTCH:PZERo:LEVel 15 dB" ! Sets the deferred Power Reduction
                                                 ! reference level to 15 dB.
```

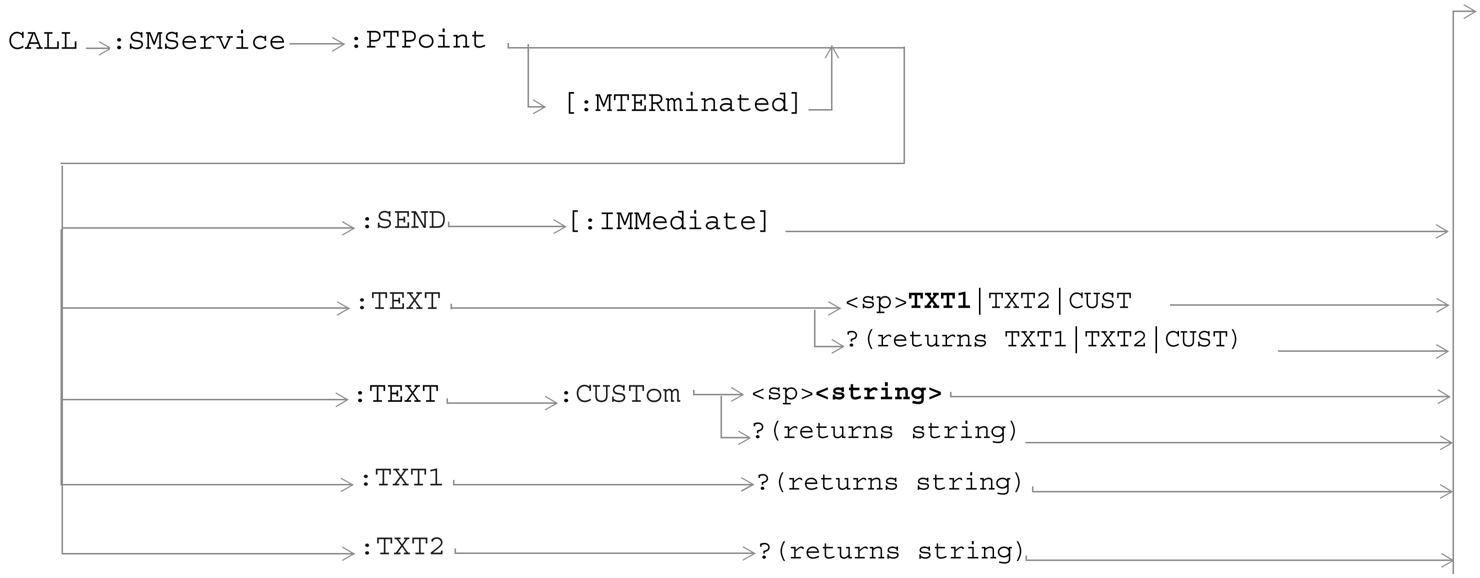
CALL:SETup:PDTCH:USFLag

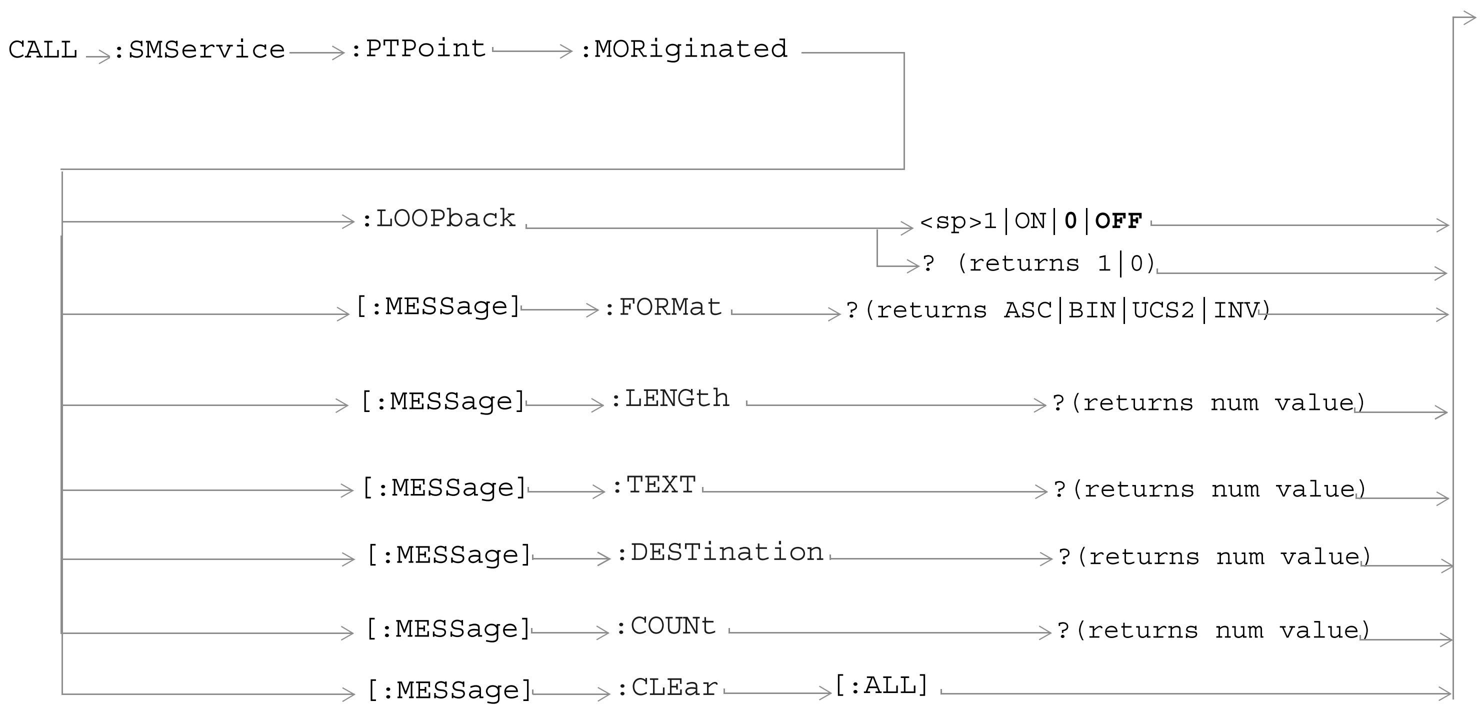
CALL:SETupPDTChannel:USFLag

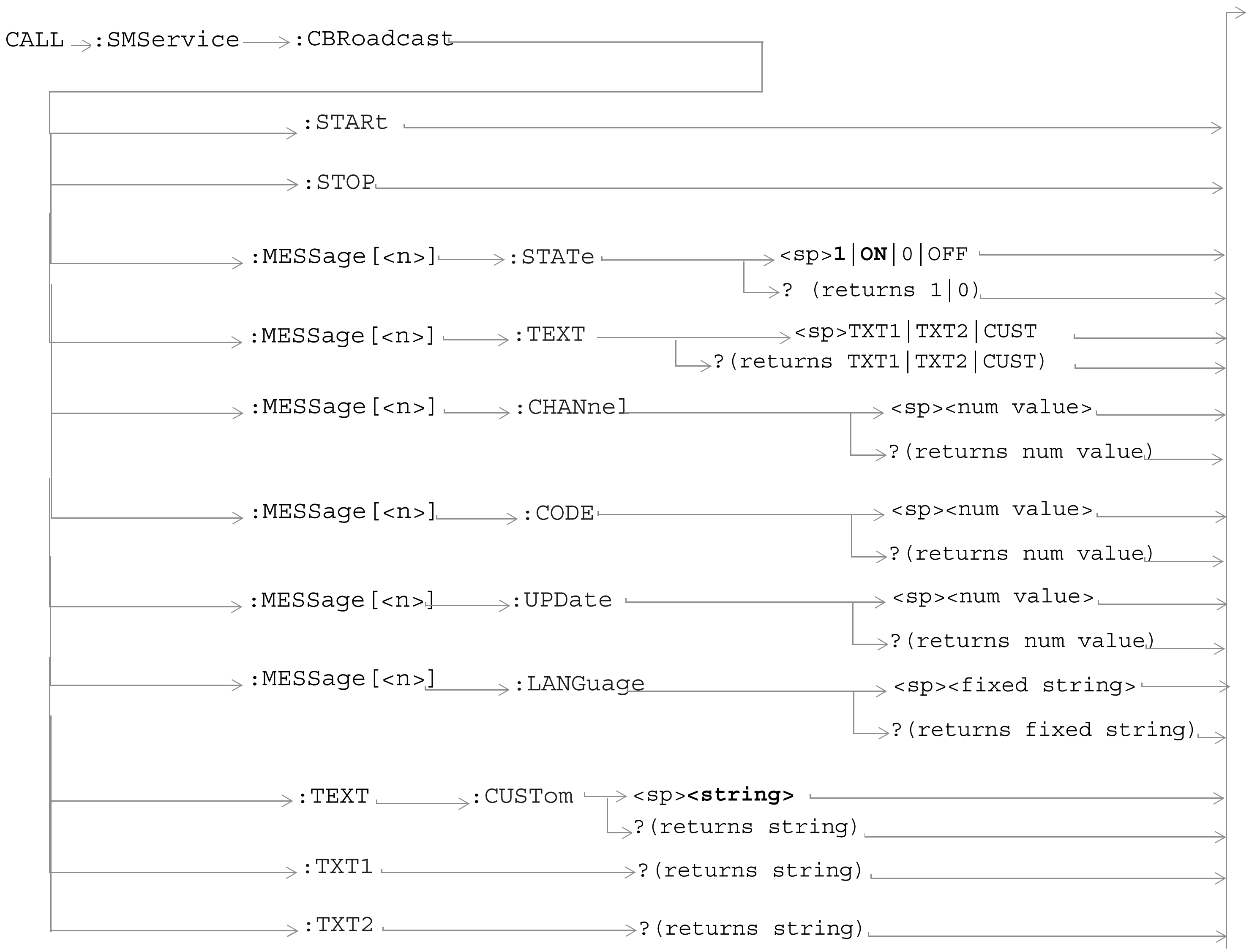
Function	This command sets/queries the uplink state flag (USF) for handoffs. The USF allows multiple mobiles to share over-the-ari resources. The USF allows you to verify that your device under test only responds when required.
Setting	Range: 0 to 7 Resolution: 1
Query	Range: 0 to 7 Resolution: 1
*RST Setting	0
Programming Example	

```
OUTPUT 714;"CALL:SETUP:PDTCH:USFLAG 5" !Sets the handoff uplink state flag to 5.
```

CALL:SMService






CALL
:SMService
:CBRoadcast
:STARt
:STOP
:MESSage[<n>]
:STATe
<sp>**1**|**ON**|0|OFF
? (returns 1|0)
:MESSage[<n>]
:TEXT
<sp>TXT1|TXT2|CUST
?(returns TXT1|TXT2|CUST)
:MESSage[<n>]
:CHANnel
<sp><num value>
?(returns num value)
:MESSage[<n>]
:CODE
<sp><num value>
?(returns num value)
:MESSage[<n>]
:UPDate
<sp><num value>
?(returns num value)
:MESSage[<n>]
:LANGuage
<sp><fixed string>
?(returns fixed string)
:TEXT
:CUSTom
<sp>**<string>**
?(returns string)
:TXT1
?(returns string)
:TXT2
?(returns string)

CALL:SMService:PTPoint[:MTERminated]:SEND[:IMMediate]S

Function	Sends the Point to Point SMS message.

CALL:SMService:PTPoint[:MTERminated]:TEXT

Function	This selects the message to be sent.
Setting	Range: TXT1 | TXT2 | CUST
Query	Range: TXT1 | TXT2 | CUST

CALL:SMService:PTPoint[:MTERminated]:TEXT:CUSTom

Function	This sets the text of the custom message to be sent.
Setting	String: 7 bit ACSII characters up to 160 characters in length.
Query	String: 7 bit ACSII characters up to 160 characters in length.

CALL:SMService:PTPoint[:MTERminated]:TXT1?

Function	This queries the fixed Text Message 1.
Query	Returns a string.

CALL:SMService:PTPoint[:MTERminated]:TXT2?

Function	This queries the fixed Text Message 2.
Query	Returns a string.

CALL:SMService:PTPoint:MORiginated:LOOPback

Function	Enables the loopback of a point-to-point message. The message should be sent to the DUT with the same parameters as the most recently received text message.
Setting	0 | OFF | 1 | ON
Query	0 | 1
*RST setting	0

CALL:SMService:PTPoint:MORiginated[:MESSage]:FORMat?

Function	Queries the Last Received Message Format.
Query	ASC | BIN | UCS2 | INV ASC: 7 bit ASCII string BIN: Binary data UCS2: Unicode Character Set 2 INV: Invalid (sent when no messages have been received

CALL:SMService:PTPoint:MORiginated[:MESSage]:LENGth?

Function		Queries the Last Received Message Length.
Query	ASC	Sends the number of characters in the text.
	BIN	Sends the length of the data in octets.
	UCS2	Sends the length of the data in octets.
	INV	NAN (Not a Number)

CALL:SMService:PTPoint:MORiginated[:MESSage]:TEXT?

Function	Queries the text from the last message received by the DUT.
Query	Returns a string.

CALL:SMService:PTPoint:MORiginated[:MESSage]:DESTination?

Function	Queries the Last received Message Destination address.
Query	Returns a string.

CALL:SMService:PTPoint:MORiginated[:MESSage]:COUNt?

Function	Queries the number of messages received.
Query	Returns a number.

CALL:SMService:PTPoint:MORiginated[:MESSage]:CLEar[:ALL]

Function	Clears all Received Message data.

CALL:SMService:CBRoadcast:MESSage[<n>]:STARt

Function	Starts the Cell Broadcast Service.

CALL:SMService:CBRoadcast:MESSage[<n>]:STOP

Function	Stops the Cell Broadcast Service

CALL:SMService:CBRoadcast:MESSage[<n>]:STATe

<table>
<tr><td>Function</td><td>Enables Cell Broadcast Message n, where n is 1, 2 or 3.</td></tr>
<tr><td>Setting</td><td>0|OFF|1|ON</td></tr>
<tr><td>Query</td><td>0| |1</td></tr>
<tr><td>*RST setting</td><td>Message 1 is ON; Messages 2 and 3 are OFF</td></tr>
</table>

CALL:SMService:CBRoadcast:MESSage[<n>]:TEXT

<table>
<tr><td>Function</td><td>Selects the message to be transmitted for Cell Broadcast Message n, where n is 1, 2 or 3.</td></tr>
<tr><td>Setting</td><td>TXT1|TXT2|CUST</td></tr>
<tr><td>Query</td><td>TXT1|TXT2|CUST</td></tr>
<tr><td>*RST setting</td><td>Message 2 is TXT2; Messages 1and 3 are TXT1</td></tr>
</table>

CALL:SMService:CBRoadcast:MESSage[<n>]:CHANnel

Function	This sets the channel number of the message to be sent.
Setting	Range: 0 to 65534
Query	Range: 0 to 65534
*RST setting	0

CALL:SMService:CBRoadcast:MESSage[<n>]:CODE

	This sets the code of the message to be sent.
Setting	Range: 0 to 1023
Query	Range: 0 to 1023
*RST setting	0

CALL:SMService:CBRoadcast:MESSage[<n>]:UPDate

Function	This sets the Update number of the message to be sent.
Setting	Range: 0 to 15
Query	Range: 0 to 15
*RST setting	0

CALL:SMService:CBRoadcast:MESSage[<n>]:LANGuage

Function	This sets the channel number of the message to be sent.
Setting	Fixed string (see table below)
Query	Fixed string
*RST setting	ENGLish

Table 15. Language values

Parameter Form	Query Value
GERMan	GERM

Table 15. Language values

Parameter Form	Query Value
ENGLish	ENGL
ITALian	ITAL
FRENch	FREN
SPANish	SPAN
DUTCh	DUTC
SWEDish	SWED
DANish	DAN
PORTugese	PORT
FINNish	FINN
NORWegian	NORW
GREek	GRE
TURKish	TURK
HUNGarian	HUNG
POLish	POL
UNSPecified	UNSP

CALL:SMService:CBRoadcast:TEXT:CUSTom

Function	This sets the text of the custom message to be sent.
Setting	String: 7 bit ACSII characters up to 93 characters in length.
Query	String: 7 bit ACSII characters up to 93 characters in length.

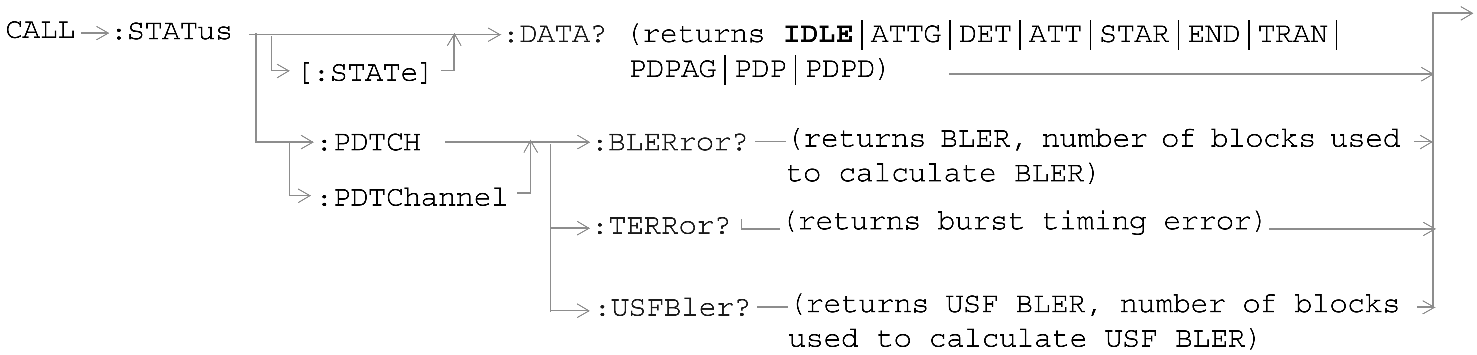
CALL:SMService:CBRoadcast:TXT1?

Function	This queries the fixed Text Message 1.
Query	Returns a string.

CALL:SMService:CBRoadcast:TXT2?

Function	This queries the fixed Text Message 2.
Query	Returns a string.

CALL:STATus



"Diagram Conventions" on page 160

CALL:STATus[:STATe]:DATA?

Function	This query returns the status of the data connection. For details on the data connection states see "Data Connection Processing State Synchronization" on page 155.
Setting	Range: • IDLE | ATTG | DET |ATT | STAR | END | TRAN | PDPAG | PDP | PDPD
Query	Range: • IDLE | ATTG | DET |ATT | STAR | END | TRAN | PDPAG | PDP | PDPD
*RST setting	IDLE
Programming Example `OUTPUT 714;"CALL:STATUS:DATA?"`	

CALL:STATus:PDTCH | PDTChannel:BLERror?

Function	This query returns the block error rate (BLER) result and the number of blocks tested to calculate the BLER result. The BLER result is only available when the data connection type is set to BLER (see "CALL:FUNCtion:DATA:TYPE" on page 211). The BLER result is only updated when the data connection state is transferring (TRAN). See "CALL:STATus[:STATe]:DATA?" on page 280. To reset the BLER result you must use "SYSTem:MEASurement:RESet" on page 368. The BLER result does not reset automatically when you connect a different GPRS mobile station. If you require more details on BLER, see "Block Error Rate (BLER) Reports Description" on page 95.
Query	Block error rate • Range: 0 to 100 and 9.91E+37 (NAN) • Resolution: 1 Blocks tested • Range: 0 to 100000 and 9.91E+37 (NAN) • Resolution: 1
*RST setting	Block error rate: 9.91E+37 (NAN), Blocks tested: 9.91E+37 (NAN)
Programming Example `OUTPUT 714;"CALL:STATus:PDTCH:BLERror?"`	

CALL:STATus:PDTCH | PDTChannel:TERRor?

Function	This query returns the burst timing error report which provides a course indication of the difference between the actual and expected burst reception times. The error is calculated on a burst by burst basis from the adaptive equalization filter coefficients. The reporting period for burst timing error is approximately 0.5 seconds, and the value returned is the peak timing error occurring during the period. Note that this report is not based on a demodulated midamble position. When there are no active PDTCHs, Burst Timing Error results are not available
Query	Range: -8 to +30 T and 9.91 E+37 (NAN) Resolution: 0.25 T
Programming Example `OUTPUT 714;"CALL:STATus:PDTCH:TERRor?"`	

CALL:STATus:PDTCH | PDTChannel:USFBler?

Function	This query returns the USF block error rate (USF BLER) result and the number of blocks tested to calculate the USF BLER result. The USF BLER result is only updated when the data connection state is transferring (TRAN). See "CALL:STATus[:STATe]:DATA?" on page 280. To reset the USF BLER result you must use "SYSTem:MEASurement:RESet" on page 368. The USF BLER result does not reset automatically when you connect a different GPRS mobile station.
Query	Block error rate • Range: 0 to 100 and 9.91E+37 (NAN) • Resolution: 1 Blocks tested • Range: 0 to 100000 and 9.91E+37 (NAN) • Resolution: 1
*RST setting	Block error rate: 9.91E+37 (NAN), Blocks tested: 9.91E+37 (NAN)
Programming Example `OUTPUT 714;"CALL:STATus:PDTCH:USFBler?"`	

CALL:TRANSferring

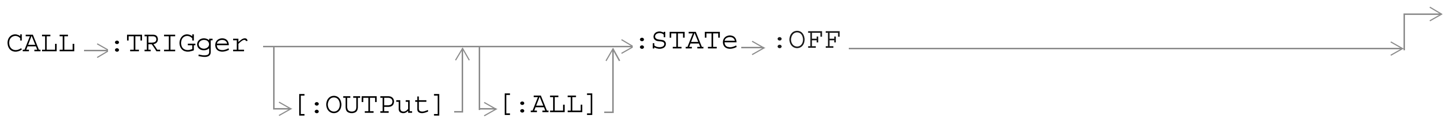
```
CALL → :TRANSferring ──────────────→ ? (returns 1|0) ──────────→
                     └→ [:STATe] ─┘
```

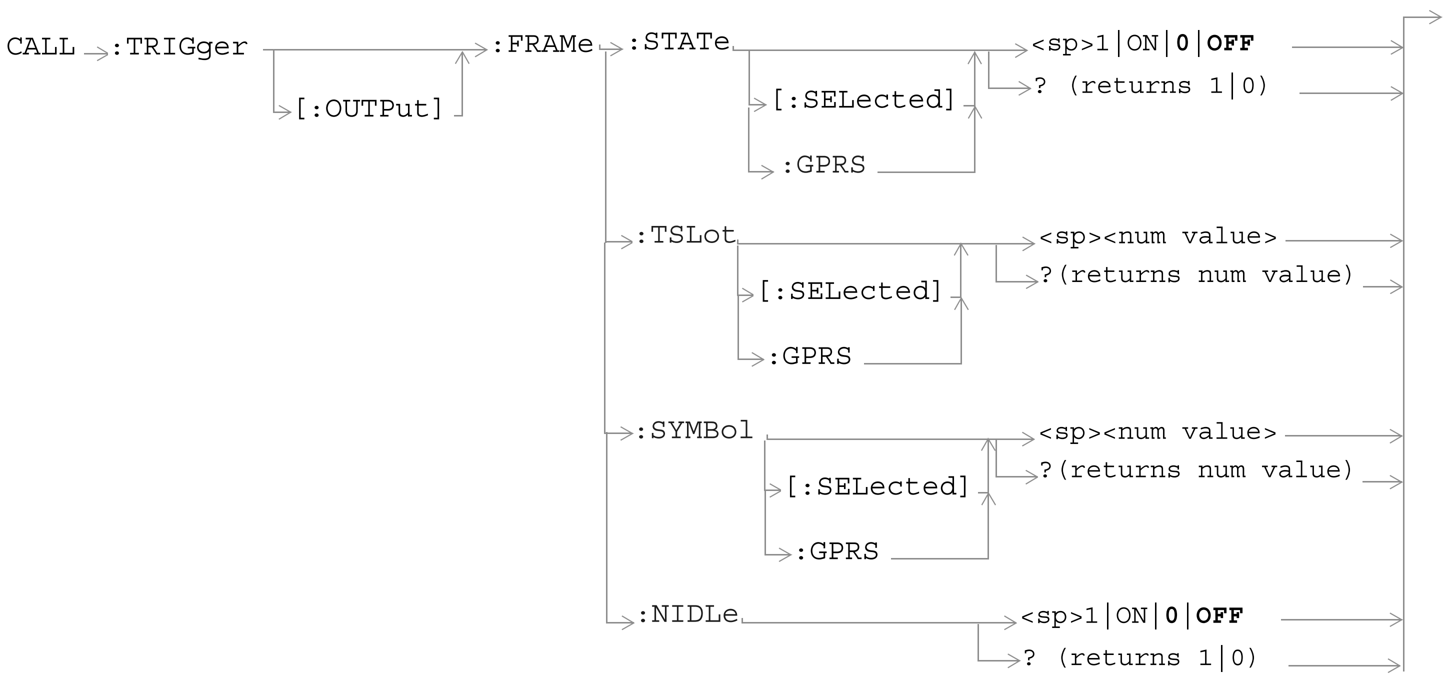
"Diagram Conventions" on page 160

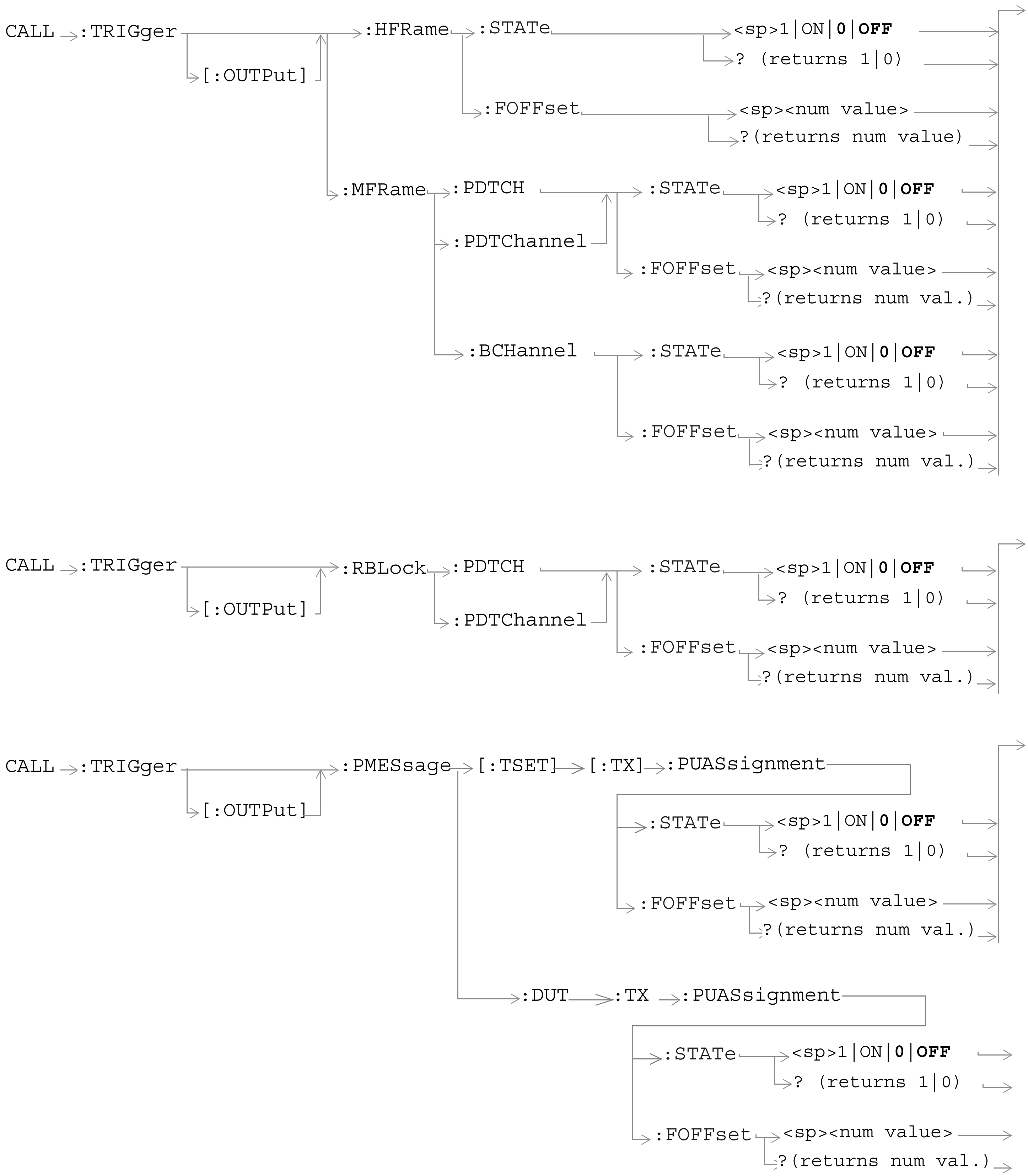
CALL:TRANSferring[:STATe]?

Function	Queries whether or not the data connection is in the transferring state. 1 is returned if the data connection is in the transferring state. 0 is returned if the data connection is in any other non-transitory state. For more details on the Transferring State query or the data connection states, see "Data Connection Processing State Synchronization" on page 155.
Query	Range: 0 | 1
*RST Setting	0 | OFF
Programming Example `OUTPUT 714;"CALL:TRANSferring:STATe?"`	

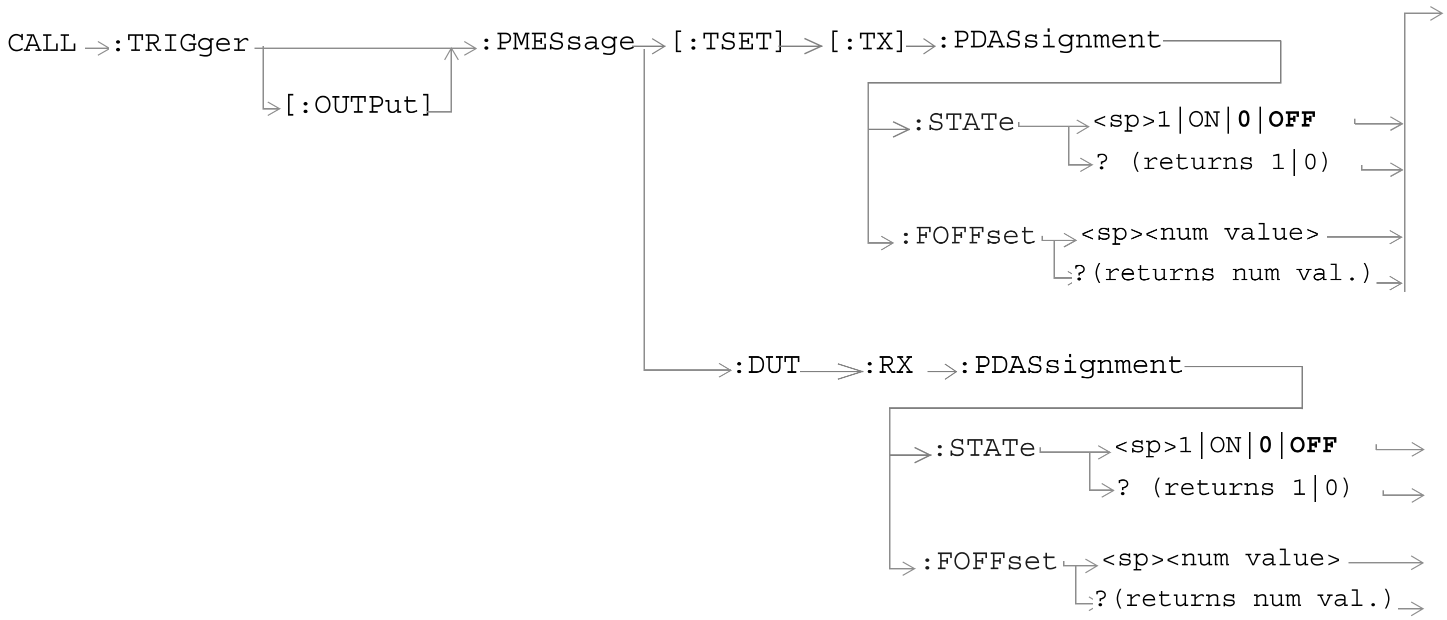
CALL:TRIGger

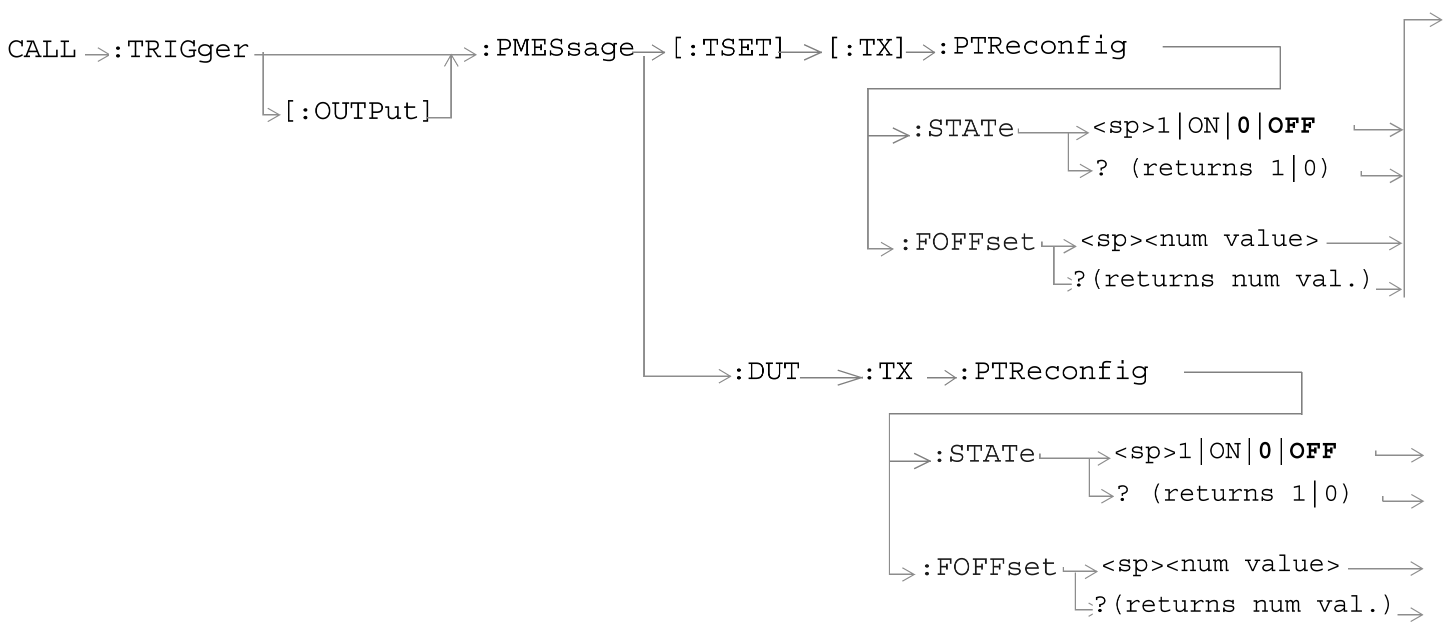


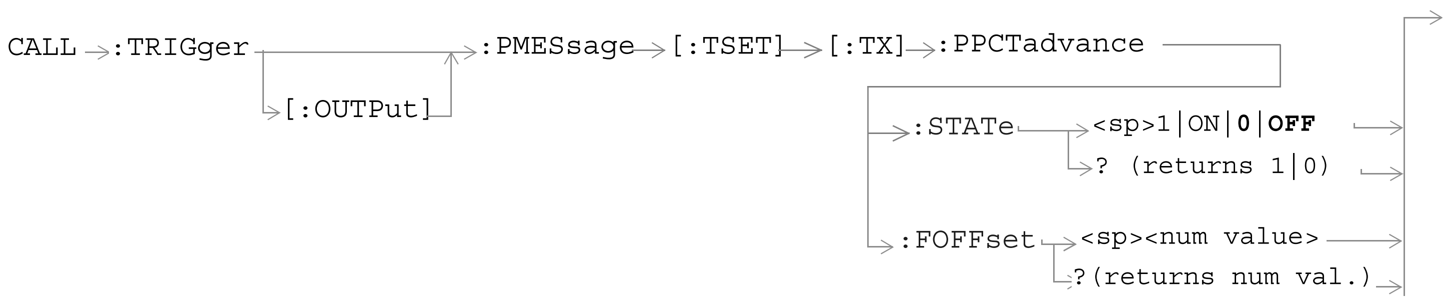


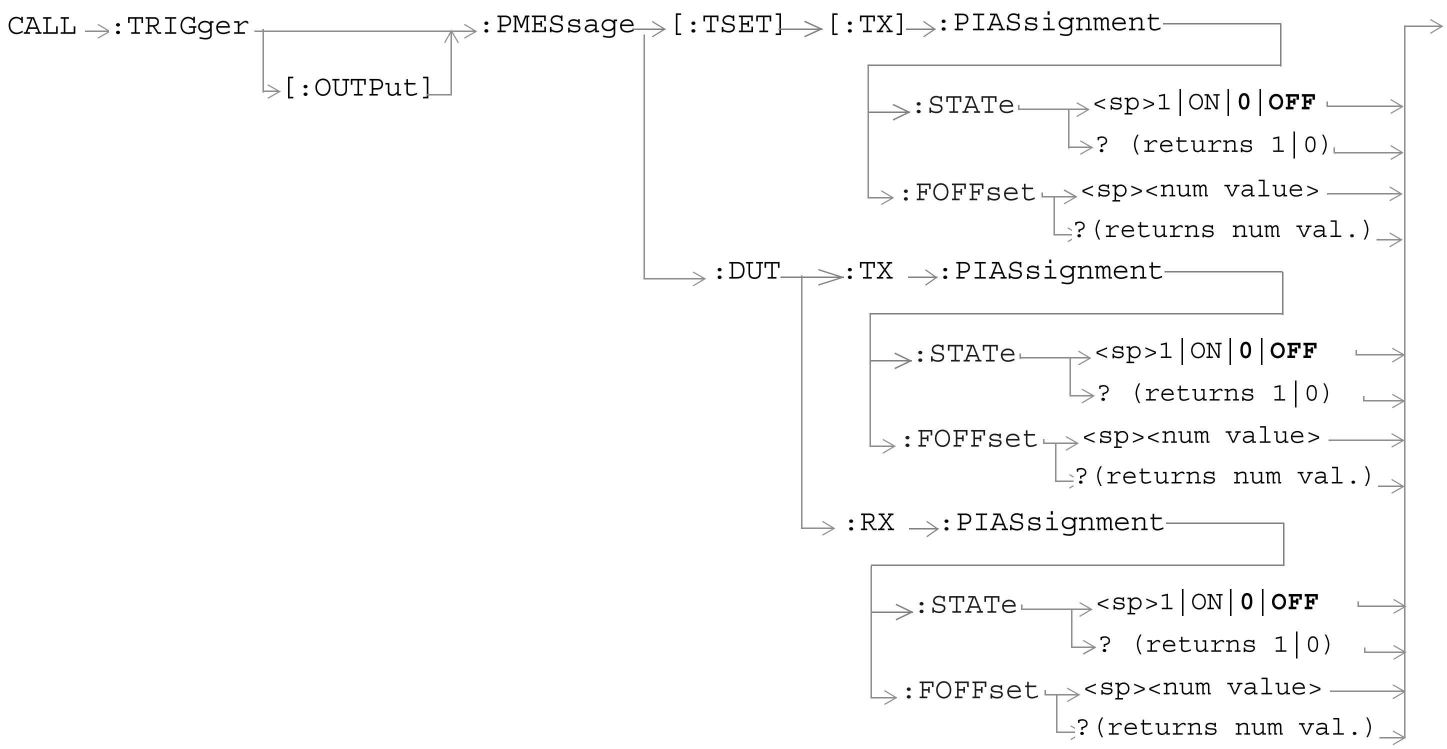

CALL
:TRIGger
[:OUTPut]
:HFRame
:STATe
<sp>1|ON|0|OFF
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num value)
:MFRame
:PDTCH
:PDTChannel
:STATe
<sp>1|ON|0|OFF
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)
:BCHannel
:STATe
<sp>1|ON|0|OFF
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)
CALL
:TRIGger
[:OUTPut]
:RBLock
:PDTCH
:PDTChannel
:STATe
<sp>1|ON|0|OFF
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)
CALL
:TRIGger
[:OUTPut]
:PMESsage
[:TSET]
[:TX]
:PUASsignment
:STATe
<sp>1|ON|0|OFF
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)
:DUT
:TX
:PUASsignment
:STATe
<sp>1|ON|0|OFF
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)

CALL:TRIGger

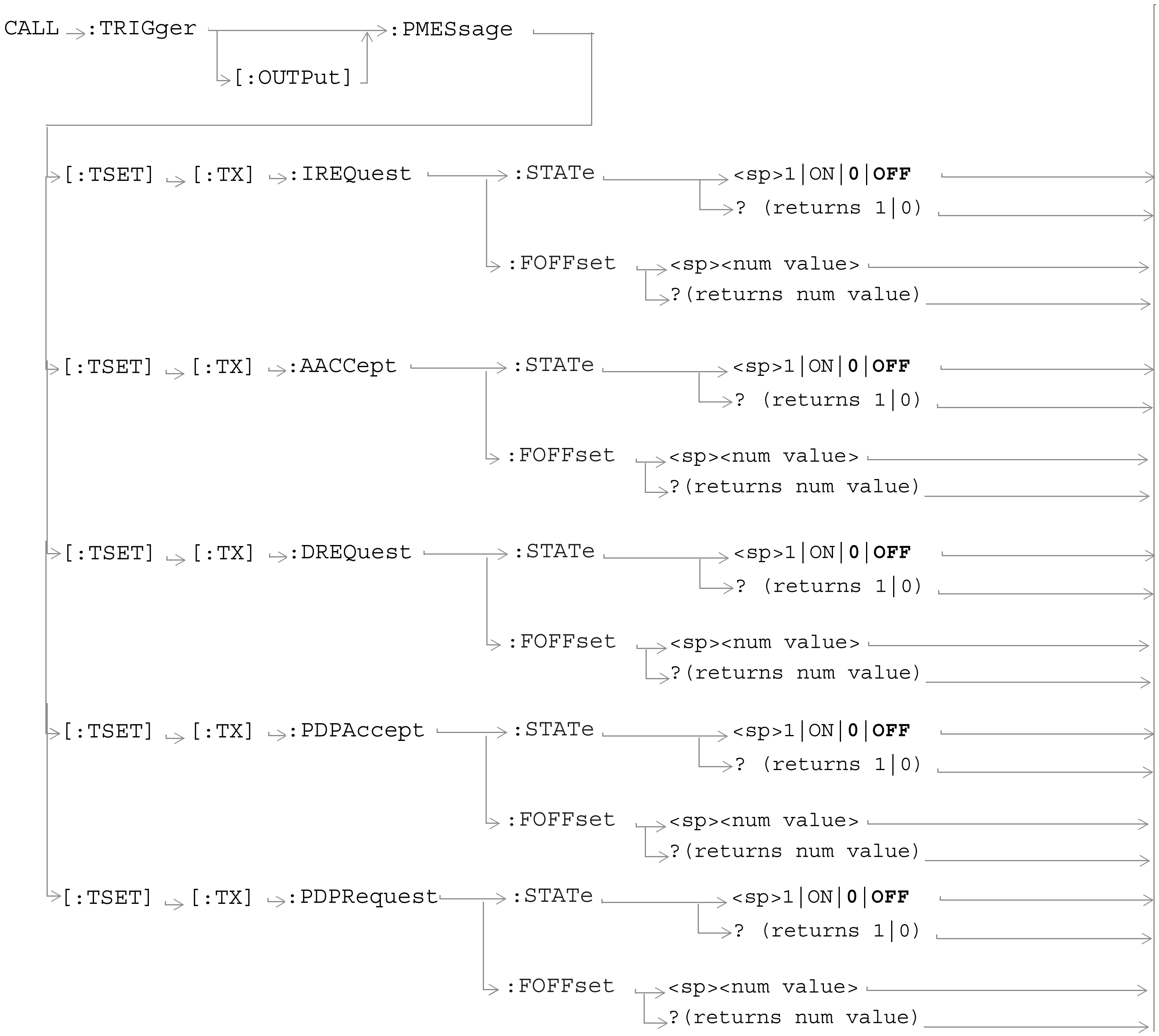





CALL
:TRIGger
[:OUTPut]
:PMESsage
[:TSET]
[:TX]
:PPCTadvance
:STATe
<sp>1|ON|**0**|**OFF**
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)


CALL
:TRIGger
[:OUTPut]
:PMESsage
[:TSET]
[:TX]
:PIASsignment
:STATe
<sp>1|ON|**0**|**OFF**
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)
:DUT
:TX
:PIASsignment
:STATe
<sp>1|ON|**0**|**OFF**
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)
:RX
:PIASsignment
:STATe
<sp>1|ON|**0**|**OFF**
? (returns 1|0)
:FOFFset
<sp><num value>
?(returns num val.)

CALL:TRIGger



“Diagram Conventions” on page 160

CALL:TRIGger[:OUTPut][:ALL]:STATe:OFF

Function	Disables all trigger signals.
Programming Example `OUTPUT 714;"CALL:TRIG:OUTP:ALL:STAT:OFF"` `!Disables all trigger signals.`	

CALL:TRIGger[:OUTPut]:FRAMe:STATe:GPRS

Function	Enables a trigger signal on every frame.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:FRAMe:TSLot

Function	Sets the timeslot on the Every Frame trigger.
Setting	Range: 0 to 7
Query	Range: 0 to 7
*RST setting	0

CALL:TRIGger[:OUTPut]:FRAMe:SYMBol

Function	Sets the symbol position on the Every Frame trigger.
Setting	Range: 0 to 1250
Query	Range: 0 to 1250
*RST setting	0

CALL:TRIGger[:OUTPut]:FRAMe:NIDLe

Function	Enables a trigger signal on every frame except the Idle Frame.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:HFRame:STATe

Function	Enables a trigger signal on every hyperframe.
Setting	0|OFF|1|ON
Query	0|1

*RST setting	0

CALL:TRIGger[:OUTPut]:HFRame:FOFFset

Function	Sets the frame offset on the hyperframe trigger.
Setting	Range: 0 to 2715647
Query	Range: 0 to 2715647
*RST setting	0

CALL:TRIGger[:OUTPut]:MFRame:PDTCH:STATe

CALL:TRIGger[:OUTPut]:MFRame:PDTCHannel:STATe

Function	Enables a trigger signal on every PDTCH multiframe.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:MFRame:PDTCH:FOFFset

CALL:TRIGger[:OUTPut]:MFRame:PDTCHannel:FOFFset

Function	Sets the frame offset on the PDTCH multiframe trigger.
Setting	Range: 0 to 51
Query	Range: 0 to 51
*RST setting	0

CALL:TRIGger[:OUTPut]:MFRame:BCH:STATe

CALL:TRIGger[:OUTPut]:MFRame:BCHannel:STATe

Function	Enables a trigger signal on every BCH multiframe.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:MFRame:BCH:FOFFset

CALL:TRIGger[:OUTPut]:MFRame:BCHannel:FOFFset

Function	Sets the frame offset on the BCH multiframe trigger.
Setting	Range: 0 to 50
Query	Range: 0 to 50

*RST setting	0

CALL:TRIGger[:OUTPut]:RBLock:PDTCH:STATe

CALL:TRIGger[:OUTPut]:RBLock:PDTCHannel:STATe

Function	Enables a trigger signal on a Radio Block.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:RBLock:PDTCH:FOFFset

CALL:TRIGger[:OUTPut]:RBLock:PDTCHannel:FOFFset

Function	Sets the frame to trigger on within the Radio Block.
Setting	Range: 0 to 3
Query	Range: 0 to 3
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PUASsignment:STATe

Function	Enables a trigger signal on the Packet Uplink Assignment message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PUASsignment:FOFFset

Function	Sets the frame offset on the trigger for the Packet Uplink Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:TX:PUASsignment:STATe

Function	Enables the Expected DUT TX trigger signal on the Packet Uplink Assignment message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:TX:PUASsignment:FOFFset

Function	Sets the frame offset on the Expected DUT TX trigger for the Packet Uplink Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PDASsignment:STATe

Function	Enables a trigger signal on the Packet Downlink Assignment message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PDASsignment:FOFFset

Function	Sets the frame offset on the trigger for the Packet Downlink Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:RX:PDASsignment:STATe

Function	Enables the First DUT RX trigger signal on the Packet Downlink Assignment message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:RX:PDASsignment:FOFFset

Function	Sets the frame offset on the First DUT RX trigger for the Packet Downlink Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PTReconfig:STATe

Function	Enables a trigger signal on the Packet Timeslot Reconfigure message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PTReconfig:FOFFset

Function	Sets the frame offset on the trigger for the Packet Timeslot Reconfigure message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:TX:PTReconfig:STATe

Function	Enables the Expected DUT TX trigger signal on the Packet Timeslot Reconfigure message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:TX:PTReconfig:FOFFset

Function	Sets the frame offset on the Expected DUT TX trigger for the Packet Timeslot Reconfigure message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PPCTadvance:STATe

Function	Enables a trigger signal on the Packet Power Control/Timing Advance message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PPCTadvance:FOFFset

Function	Sets the frame offset on the trigger for the Packet Power Control/Timing Advance message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PIASsignment:STATe

Function	Enables a trigger signal on the Packet Immediate Assignment message.
Setting	0 | OFF | 1 | ON
Query	0 | 1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PIASsignment:FOFFset

Function	Sets the frame offset on the trigger for the Packet Immediate Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:TX:PIASsignment:STATe

Function	Enables the DUT TX trigger signal on the Packet Immediate Assignment message.
Setting	0 | OFF | 1 | ON
Query	0 | 1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:TX:PIASsignment:FOFFset

Function	Sets the frame offset on the DUT TX trigger for the Packet Immediate Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:RX:PIASsignment:STATe

Function	Enables the DUT RX trigger signal on the Packet Immediate Assignment message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage:DUT:RX:PIASsignment:FOFFset

Function	Sets the frame offset on the DUT RX trigger for the Packet Immediate Assignment message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:IREQuest:STATe

Function	Enables a trigger signal on the Identity Request message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:IREQuest:FOFFset

Function	Sets the frame offset on the trigger for the Identity Request message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:AACCept:STATe

Function	Enables a trigger signal on the Attach Accept message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:AACCept:FOFFset

Function	Sets the frame offset on the trigger for the Attach Accept message.

CALL:TRIGger

Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:DREQuest:STATe

Function	Enables a trigger signal on the Detach Request message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:DREQuest:FOFFset

Function	Sets the frame offset on the trigger for the Detach Request message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PDPAccept:STATe

Function	Enables a trigger signal on the PDP Context Activation Accept message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PDPAccept:FOFFset

Function	Sets the frame offset on the trigger for the PDP Context Activation Accept message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PDPRequest:STATe

Function	Enables a trigger signal on the Request PDP Context Activation message.
Setting	0|OFF|1|ON
Query	0|1
*RST setting	0

CALL:TRIGger[:OUTPut]:PMESsage[:TSET][:TX]:PDPRequest:FOFFset

Function	Sets the frame offset on the trigger for the Request PDP Context Activation message.
Setting	Range: 0 to 20000
Query	Range: 0 to 20000
*RST setting	0

STATus Subsystem Description

Description

The STATus subsystem is used to communicate current test set status information to the controlling application program.

Syntax Diagrams and Command Descriptions

Status Register Bit Definitions

STATus:OPERation

```
STATus → :OPERation ─┬──────────────────→ ? (reads event register)
                     │└→ [:EVENt] ┘
                     ├→ :CONDition? (reads condition register)
                     ├→ :ENABle ──┬→ <sp><num value> (writes to enable register)
                     │            └→ ? (reads enable register)
                     ├→ :NTRansition ──┬→ <sp><num value> (writes to Negative
                     │                 │   Transition Filter register)
                     │                 └→ ? (reads Negative Transition Filter
                     │                    register)
                     └→ :PTRansition ──┬→ <sp><num value> (writes to Positive
                                       │   Transition Filter register)
                                       └→ ? (reads Positive Transition Filter
                                          register)
```

```
STATus → :OPERation:CALL ─┬──────────────────→ ? (reads event register)
                          │└→ [:EVENt] ┘
                          ├→ :CONDition? (reads condition register)
                          ├→ :ENABle ──┬→ <sp><num value> (writes to enable
                          │            │   register)
                          │            └→ ? (reads enable register)
                          ├→ :NTRansition ──┬→ <sp><num value> (writes to Nega-
                          │                 │   tive Transition Filter register)
                          │                 └→ ? (reads Negative Transition
                          │                    Filter register)
                          └→ :PTRansition ──┬→ <sp><num value> (writes to
                                            │   Positive Transition Filter
                                            │   register)
                                            └→ ? (reads Positive Transition
                                               Filter register)
```

STATus :OPERation:CALL:COMMon

? (reads event register)

[:EVENt]

:CONDition? (reads condition register)

:ENABle <sp><num value> (writes to enable register)

? (reads enable register)

:NTRansition <sp><num value> (writes to Negative Transition Filter register)

? (reads Negative Transition Filter register)

:PTRansition <sp><num value> (writes to Positive Transition Filter register)

? (reads Positive Transition Filter register)

STATus :OPERation:CALL:COMMon:DATA

? (reads event register)

[:EVENt]

:CONDition? (reads condition register)

:ENABle <sp><num value> (writes to enable register)

? (reads enable register)

:NTRansition <sp><num value> (writes to Negative Transition Filter register)

? (reads Negative Transition Filter register)

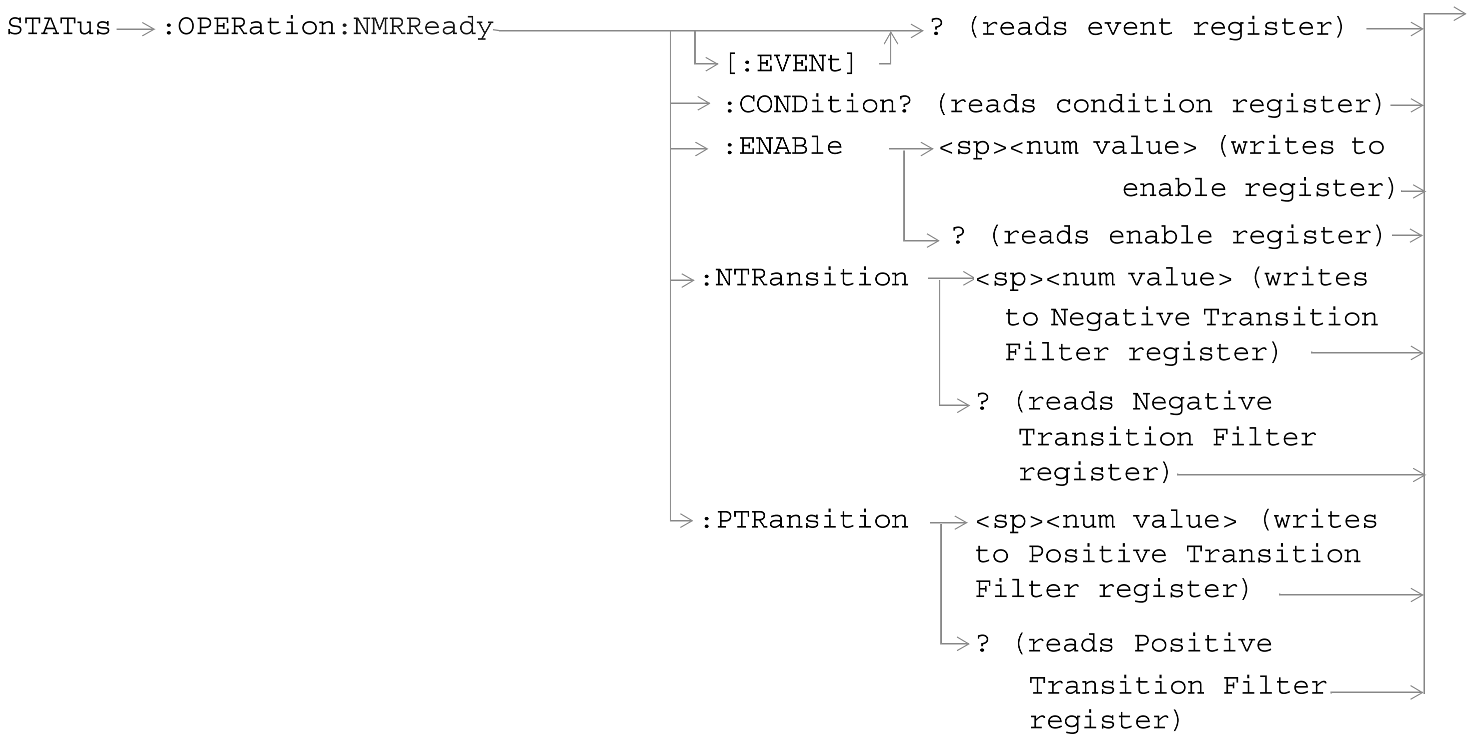
:PTRansition <sp><num value> (writes to Positive Transition Filter register)

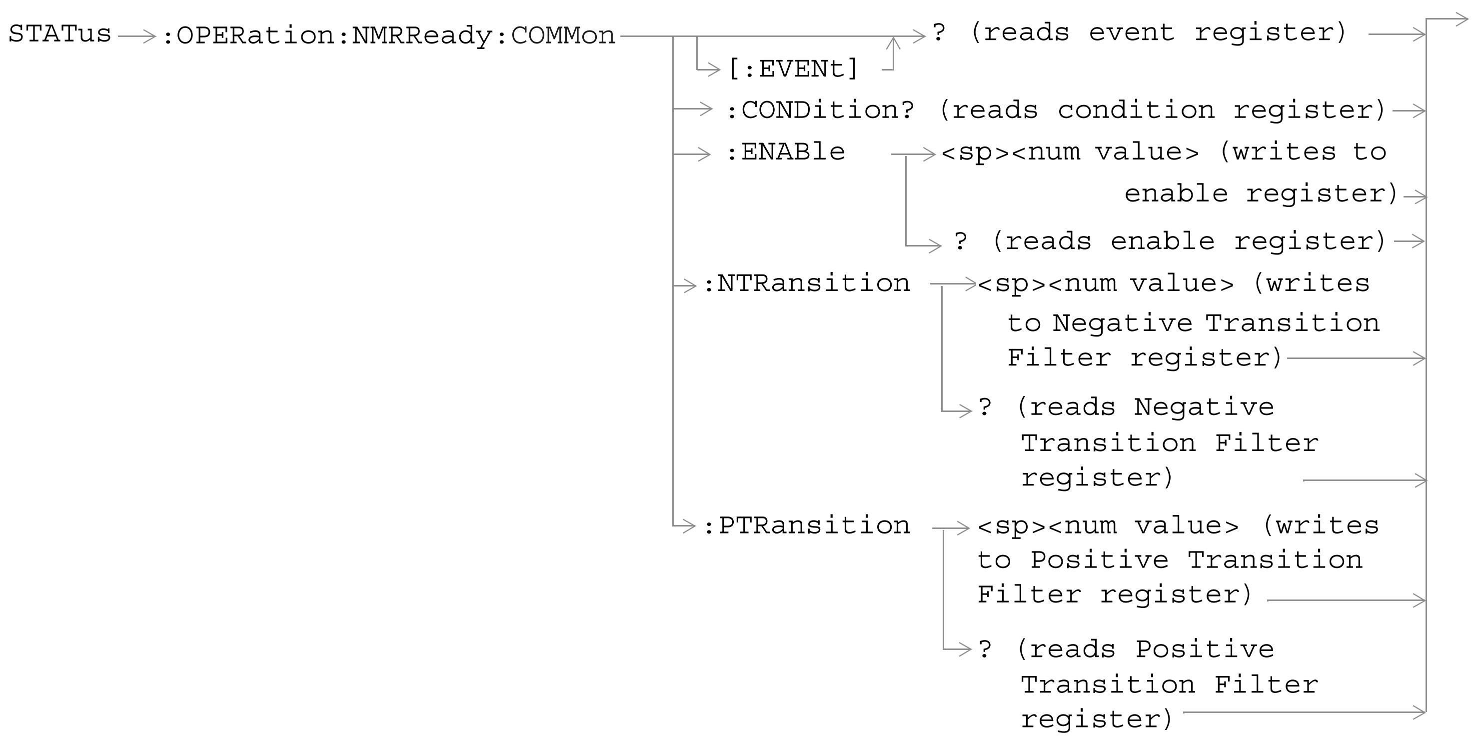
? (reads Positive Transition Filter register)

STATus:OPERation

```
STATus:OPERation:HARDware
    [:EVENt] ? (reads event register)
    :CONDition? (reads condition register)
    :ENABle
        <sp><num value> (writes to enable register)
        ? (reads enable register)
    :NTRansition
        <sp><num value> (writes to Negative Transition Filter register)
        ? (reads Negative Transition Filter register)
    :PTRansition
        <sp><num value> (writes to Positive Transition Filter register)
        ? (reads Positive Transition Filter register)
```

```
STATus:OPERation:KEYPressed
    [:EVENt] ? (reads event register)
    :CONDition? (reads condition register)
    :ENABle
        <sp><num value> (writes to enable register)
        ? (reads enable register)
    :NTRansition
        <sp><num value> (writes to Negative Transition Filter register)
        ? (reads Negative Transition Filter register)
    :PTRansition
        <sp><num value> (writes to Positive Transition Filter register)
        ? (reads Positive Transition Filter register)
```





"Diagram Conventions" on page 160

STATus:OPERation Condition Register Bit Assignment

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	Processing SYSTem:SYNChronized Command	This condition bit is "pulsed" by the SYSTem:SYNChronized command. This allows 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 bit for the STATus:OPERation:CALL register.
9	512	NMRReady (New Measurement Result Ready) Summary	This bit is the summary 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 and clears the Operation
                                     !Event Register
OUTPUT 714;"STATUS:OPERATION:CONDITION?" !Queries and clears the Operation
                                         !Condition Register
OUTPUT 714;"STATUS:OPERATION:ENABLE 1024" !Sets the Operation
                                          !Enable
                                          !Register for bit 10
OUTPUT 714;"STATUS:OPERATION:NTRANSITION 2" !Sets the Operation
```

```
                                              !Negative Transition
                                              !Filter Register for bit 1
OUTPUT 714;"STATUS:OPERATION:PTRANSITION 2"   !Sets the Operation
                                              !Positive Tranasition
                                              !Filter Register for bit 1
```

STATus:OPERation:CALL Condition Register Bit Assignment

The STATus:OPERation:CALL register bits are 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	GPRS Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:GPRS register.
11	2048	WCDMa Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:WCDMa register.
10	1024	FDD Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:FDD register.
9	512	TA2000 Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:CDMA register.
7	128	DIGital2000 Summary bit.	This bit is the summary bit for the STATus:OPERation:CALL:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:DIGital136 register.
3	8	AMPS Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:AMPS register.
2	4	GSM Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:GSM register.
1	2	COMMon Summary bit	This bit is the summary bit for the STATus:OPERation:CALL:COMMon register.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATus:OPERation:CALL

```
OUTPUT 714;"STATUS:OPERATION:CALL:EVENT?" !Queries and clears the Operation Call Event
                                          !Register
OUTPUT 714;"STATUS:OPERATION:CALL:CONDITION?" !Queries and clears 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 Filter
                                         !Register for bit 2
OUTPUT 714;"STATUS:OPERATION:CALL:PTR 256" !Sets the Positive Transition Filter
                                           !Register for bit 8
```

STATus:OPERation:CALL:COMMon Condition Register Bit Assignment

The STATus:OPERation:CALL:COMMon register bits are 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 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: • 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 set to a 1 when the call control status change detector has been armed.
5	32	Reserved for future use.	This bit is always 0.
4	16	Reserved for future use.	This bit is always 0.

Bit Number	Binary Weighting	Condition	Description
3	8	Call Control Status Alerting	This bit is a 1 when the test set is in the call alerting state (ringing).
2	4	Call Control Status Connected	This bit is a 1 when the test set is in the call connected state.
1	2	Call Control Status 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.

Program Examples STATus:OPERation:CALL:COMMon

```
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:EVENT?" !Queries and clears the Operation
                                                 !Call
                                                 !Common Event Register
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:CONDITION?" !Queries and clears the Operation
                                                     !Call
                                                     !Common Condition Register
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:ENABLE 1024" !Sets the Operation
                                                      !Call
                                                      !Common Enable
                                                      !Register for bit 10
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:NTRANSITION 2" !Sets the Operation
                                                        !Call
                                                        !Common Negative Transition
                                                        !Filter Register for bit 1
OUTPUT 714;"STATUS:OPERATION:CALL:COMMON:PTRANSITION 2" !Set the Operation
                                                        !Call
                                                        !Common Positive Transition
                                                        !Filter Register for bit 1
```

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.

Bit Number	Binary Weighting	Condition	Description
9	512	Reserved for future use.	This bit is always 0.
8	256	PDP Active state	This bit is a 1 when the PDP is active, zero when inactive.
7	128	Starting Data Connection	This bit is a 1 when: • 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 a 1 when the data connection status is Transferring.
2	4	Data Connection Status Attached	This bit is a 1 when the data connection status is Attached.
1	2	Data Connection Status Idle	This bit is a 1 when the data connection status is Idle.
0	1	Extension Bit	This bit is always 0.

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:HARDware Register Bit Assignments

The STATus:OPERation:HARDware register bits indicate information about the test set's hardware during 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	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	External Timebase in use	This bit is a 1 if a suitable external timebase is connected to the test set’s 10 MHz REF IN connector on the rear panel of the test set.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATus:OPERation:HARDware

```
OUTPUT 714;”STATUS:OPERATION:HARDWARE:EVENT?” !Queries the Hardware Event Register.
OUTPUT 714;”STATUS:OPERATION:HARDWARE:CONDITION?” !Queries the Hardware Condition Register.
OUTPUT 714;”STATUS:OPERATION:HARDWARE:ENABLE 16” !Sets New Measurement Results Hardware for
                                                 !bit 16.
OUTPUT 714;”STATUS:OPERATION:HARDWARE:NTR 2” !Sets the Hardware Negative Transition
                                             !Register for bit 4.
OUTPUT 714;”STATUS:OPERATION:HARDWARE:PTR 4” !Sets the Hardware Positive Transition
                                             !Register for bit 4.
```

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 F12 softkey has been pressed.
10	1024	F11 softkey	This bit is a 1 when the F11 softkey has been pressed.
9	512	F10 softkey	This bit is a 1 when the F10 softkey has been pressed.
8	256	F9 softkey	This bit is a 1 when the F9 softkey has been pressed.
7	128	F8 softkey	This bit is a 1 when the F8 softkey has been pressed.
6	64	F7 softkey	This bit is a 1 when the F7 softkey has been pressed.
5	32	F6 softkey	This bit is a 1 when the F6 softkey has been pressed.
4	16	F5 softkey	This bit is a 1 when the F5 softkey has been pressed.
3	8	F4 softkey	This bit is a 1 when the F4 softkey has been pressed.
2	4	F3 softkey	This bit is a 1 when the F3 softkey has been pressed.
1	2	F2 softkey	This bit is a 1 when the F2 softkey has been pressed.
0	1	F1 softkey	This bit is a 1 when the F1 softkey has been pressed.

Program Examples - STATus:OPERation:KEYPressed

```
OUTPUT 714;"STATUS:OPERATION:KEYPRESSED:EVENT?" !Queries the Keypressed Event Register.
```

STATus:OPERation:NMRReady Condition Register Bit Assignment

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	GPRS Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:GPRS register.
11	2048	WCDMa Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:WCDMa register.
10	1024	FDD Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:FDD register.
9	512	TA2000 Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:DIGital136 register.
3	8	AMPS Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:AMPS register.
2	4	GSM Summary bit	This bit is the summary bit for the STATus:OPERation:NMRReady:GSM register.
1	2	COMMon Summary bit	This bit is the summary 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 and clears the New Measurement
                                               !Results Ready Event Register
OUTPUT 714;”STATUS:OPERATION:NMRREADY:CONDITION?”  !Queries and clears the New Measurement
                                                   !Results Ready
                                                   !Condition Register
```

STATus:OPERation

```
OUTPUT 714;"STATUS:OPERATION:NMRREADY:ENABLE 16" !Sets New Measurement Results
                                                  !Ready Enable Regigter
                                                  !for bit 4
OUTPUT 714;"STATUS:OPERATION:NMRREADY:NTR 2" !Sets the New Measurement Results
                                              !Ready Negative Transition Filter
                                              !Register for bit 1
OUTPUT 714;"STATUS:OPERATION:NMRREADY:PTR 4" !Sets the New Measurement
                                              !Results Ready Positive
                                              !Transition Filter Register
                                              !for bit 2
```

STATus:OPERation:NMRReady:COMMon Condition Register Bit Assignment

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 bit for the STATus:OPERation:NMRReady:COMMon Audio Analyzer register.
0	1	Extension Bit	This bit is always 0.

Program Examples - STATus:OPERation:NMRReady:COMMon

```
OUTPUT 714;"STATUS:OPERATION:NMRREADY:COMMON:EVENT?" !Queries and clears the Operation
                                                      !New Measurement Results Ready
                                                      !Common Event Register
```

```
OUTPUT 714;”STATUS:OPERATION:NMRREADY:COMMON:CONDITION?” !Queries and clears the Operation
                                                         !New Measurement Results Ready
                                                         !Common Condition Register
OUTPUT 714;”STATUS:OPERATION:NMRREADY:COMMON:ENABLE 1024” !Sets the Operation
                                                          !New Measurement Results Ready
                                                          !Common Enable
                                                          !Register for bit 10
OUTPUT 714;”STATUS:OPERATION:NMRREADY:COMMON:NTRANSITION 2” !Sets the Operation
                                                            !New Measurement Results Ready
                                                            !Common Negative Transition
                                                            !Filter Register for bit 1
OUTPUT 714;”STATUS:OPERATION:NMRREADY:COMMON:PTRANSITION 2” !Set the Operation
                                                            !New Measurement Results Ready
                                                            !Common Positive Tranasition
                                                            !Filter Register for bit 1
```

STATus:PRESet

```
STATus ──> :PRESet ──────────────────────────────>
```

"Diagram Conventions" on page 160

STATus:PRESet

Function	Presets the Status Subsystem Sets all Enable Registers to 0 (not enabled). Sets all Positive Transition Registers (PTR) to 1 (positive transitions enabled). Sets all Negative Transition Registers (NTR) to 0 (negative transitions disabled).

STATus:QUEStionable

```
STATus :QUEStionable
    [:EVENt] ? (reads event register)
    :CONDition? (reads condition register)
    :ENABle <sp><num value> (writes to enable register)
            ? (reads enable register)
    :NTRansition <sp><num value> (writes to Negative Transition Filter register)
                 ? (reads Negative Transition Filter register)
    :PTRansition <sp><num value> (writes to Positive Transition Filter register)
                 ? (reads Positive Transition Filter register)
```

```
STATus :QUEStionable:CALL
    [:EVENt] ? (reads event register)
    :CONDition? (reads condition register)
    :ENABle <sp><num value> (writes to enable register)
            ? (reads enable register)
    :NTRansition <sp><num value> (writes to Negative Transition Filter register)
                 ? (reads Negative Transition Filter register)
    :PTRansition <sp><num value> (writes to Positive Transition Filter register)
                 ? (reads Positive Transition Filter register)
```

```
STATus :QUEStionable:CALL:COMMon
    [:EVENt] ? (reads event register)
    :CONDition? (reads condition register)
    :ENABle
        <sp><num value> (writes to enable register)
        ? (reads enable register)
    :NTRansition
        <sp><num value> (writes to Negative Transition Filter register)
        ? (reads Negative Transition Filter register)
    :PTRansition
        <sp><num value> (writes to Positive Transition Filter register)
        ? (reads Positive Transition Filter register)
```

```
STATus :QUEStionable:CALL:GPRS
    [:EVENt] ? (reads event register)
    :CONDition? (reads condition register)
    :ENABle
        <sp><num value> (writes to enable register)
        ? (reads enable register)
    :NTRansition
        <sp><num value> (writes to Negative Transition Filter register)
        ? (reads Negative Transition Filter register)
    :PTRansition
        <sp><num value> (writes to Positive Transition Filter register)
        ? (reads Positive Transition Filter register)
```

STATus :QUEStionable:ERRors

? (reads event register)

[:EVENt]

:CONDition? (reads condition register)

:ENABle <sp><num value> (writes to enable register)

? (reads enable register)

:NTRansition <sp><num value> (writes to Negative Transition Filter register)

? (reads Negative Transition Filter register)

:PTRansition <sp><num value> (writes to Positive Transition Filter register)

? (reads Positive Transition Filter register)

STATus QUEStionable:ERRors:COMMon

? (reads event register)

[:EVENt]

:CONDition? (reads condition register)

:ENABle <sp><num value> (writes to enable register)

? (reads enable register)

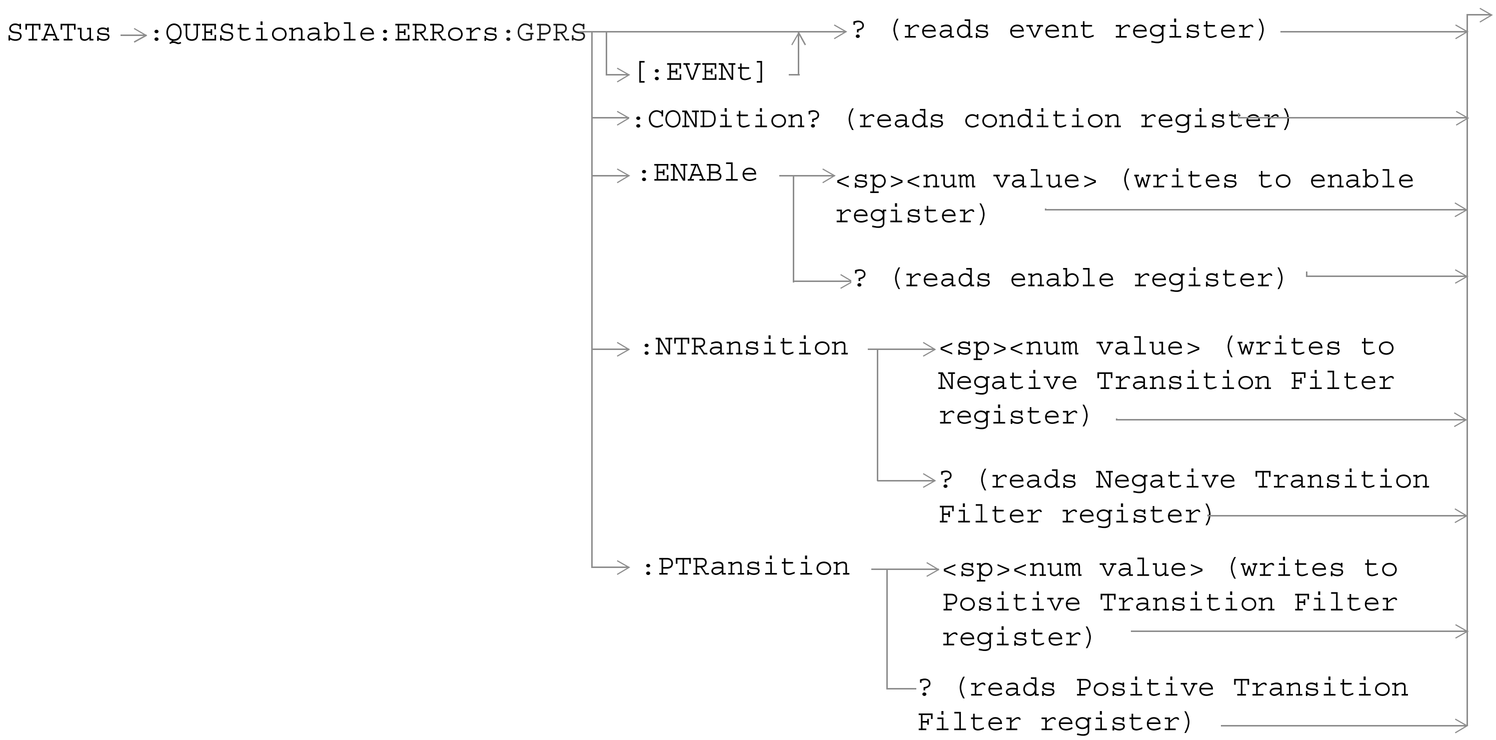
:NTRansition <sp><num value> (writes to Negative Transition Filter register)

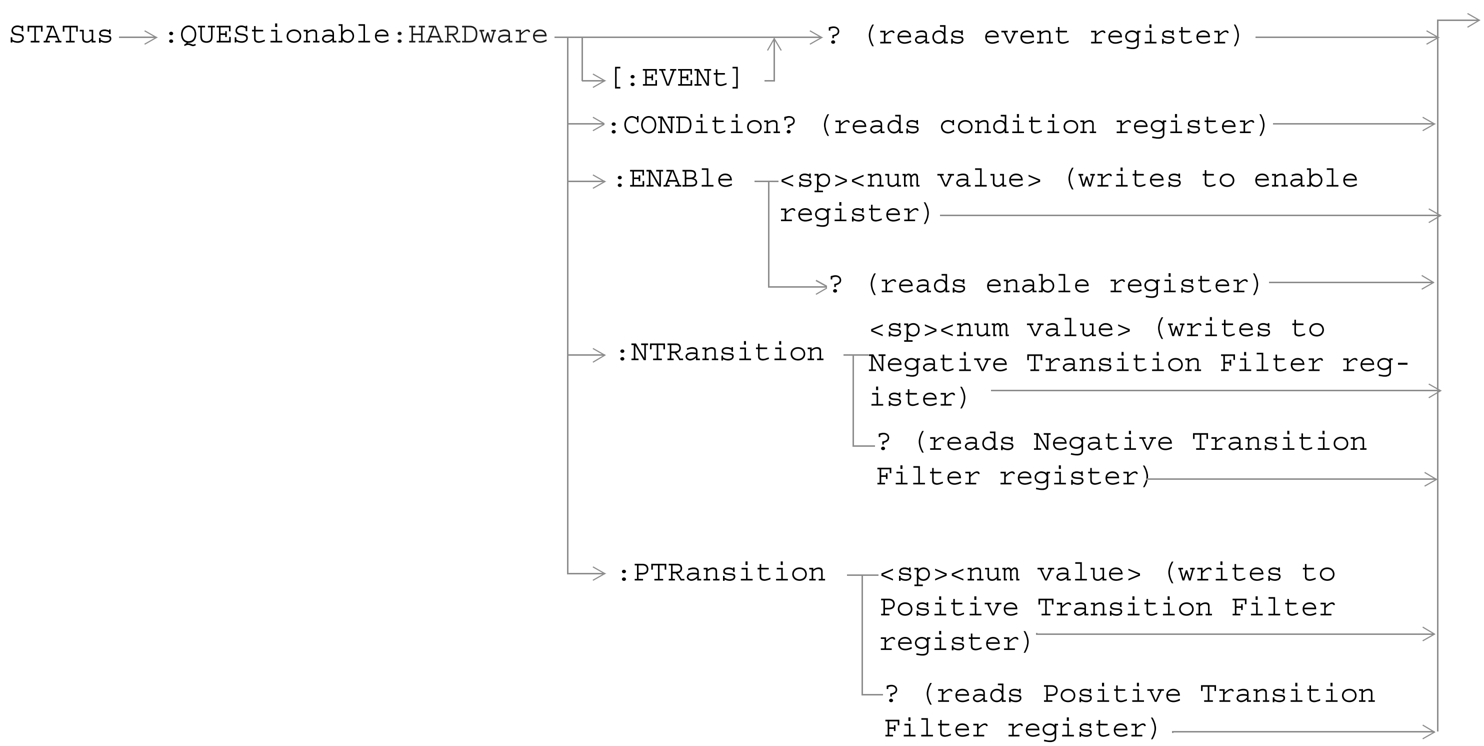
? (reads Negative Transition Filter register)

:PTRansition <sp><num value> (writes to Positive Transition Filter register)

? (reads Positive Transition Filter register)

STATus:QUEStionable





"Diagram Conventions" on page 160

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 bit for the STATus:QUEStionable:HARDware register.
10	1024	QUEStionable:CALL summary	This bit is the summary 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 bit for the STATus:QUEStionable:ERRors register.
0	1	Reserved for future use.	This bit is always 0.

Program Example - STATus:QUEStionable Condition Register Bit Assignment

```
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 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	GPRS Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:GPRS register.
11	2048	WCDMa Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:WCDMa register.
10	1024	FDD Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:FDD register.
9	512	TA2000 Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:DIGital136 register.
3	8	AMPS Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:AMPS register.
2	4	GSM Summary bit	This bit is the summary bit for the STATus:QUEStionable:CALL:GSM register.
1	2	COMMon Summary bit	This bit is the summary 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 Registerfor bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:PTRANSITION 2"
  !Sets the Questionable Call Positive Transition Filter Register for bit 1
```

STATus:QUEStionable:CALL:COMMon Condition Register Bit Assignment

The STATus:QUEStionable:CALL:COMMon registers contain information about which event(s) occurred during normal call processing that indicate why the 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	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	Reserved for future use.	This bit is always 0.
0	1	Extension Bit	This bit is always 0.

Program Example - STATus:QUEStionable:CALL:COMMon Condition Register Bit Assignment

```
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:COMMON:EVENT?" !Queries and clears the Questionable
                                                    !Call Common Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:COMMON:CONDITION?" !Queries and clears the Questionable
                                                        !Call Common Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:COMMON:ENABLE 1024" !Sets the Questionable Call Common
                                                         !Enable Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:COMMON:NTRANSITION 2" !Sets the Questionable Call
                                                           !Common Negative Transition
                                                           !Filter Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:GSM:PTRANSITION 2" !Sets the Questionable Call
                                                        !Common Positive Transition
```

```
!Filter Register for bit 1
```

STATus:QUEStionable:CALL:GPRS Condition Register Bit Assignment

The STATus:QUEStionable:CALL:GPRS registers contain information about which event(s) occurred during GPRS call processing, relating to a data connection, that indicate why the 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	End Data Connection Failure	This bit is a 1 if the test set timed out waiting for the data connection to end.
9	512	MS Unexpectedly Ended TBF	This bit is a 1 if the mobile station unexpectedly ended the TBF (temporary block flow).
8	256	Downlink Immediate Assignment Failure	This bit is a 1 if the mobile station did not respond to the downlink immediate assignment.
7	128	Uplink Immediate Assignment Failure	This bit is a 1 if the mobile station did not respond to the uplink immediate assignment.
6	64	Downlink Timed Out	This bit is a 1 if the mobile station timed out ACK (Acknowledged) or NACK (Not Acknowledged) exchanges and released the TBF (temporary block flow).
5	32	No Data Received Recently	This bit is a 1 if no data was received from the mobile station in the allowed time.
4	16	Start Data Connection Failure	This bit is a 1 if the GPRS test application was unable to start the data connection with the DUT (Device Under Test).
3	8	Routing Area Update Failure	This bit is a 1 if the Routing Area Update procedure failed after five attempts. The Data Connection Status will not be changed.
2	4	Detach Failure	This bit is a 1 if the Detach procedure failed after five attempts. The Data Connection Status is set to Idle.
1	2	Attach Failure	This bit is a 1 if the Attach procedure failed after five attempts. The Data Connection Status is set to Idle.
0	1	Extension Bit	This bit is always 0.

Program Example - STATus:QUEStionable:CALL:GPRS Condition Register Bit Assignment

```
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:GPRS:EVENT?" !Queries and clears the Questionable
                                                  !Call GPRS Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:GPRS:CONDITION?" !Queries and clears the
                                                      !Questionable Call GPRS
                                                      !Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:GPRS:ENABLE 1024" !Sets the Questionable Call GPRS
                                                       !Enable Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:GPRS:NTRANSITION 2" !Sets the Questionable Call
                                                         !GPRS Negative Transition Filter
                                                         !Register for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:CALL:GPRS:PTRANSITION 2" !Sets the  Questionable Call GPRS
                                                           !Positive Transition Filter
                                                             !Register for bit 1
```

STATus:QUEStionable:ERRors Condition Register Bit Assignment

The STATus:QUEStionable:ERRors register bits are 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	GPRS Summary bit	This bit is the summary bit for the QUEStionable:ERRors:GPRS register.
11	2048	WCDMa Summary bit	This bit is the summary bit for the QUEStionable:ERRors:WCDMa register.
10	1024	FDD Summary bit	This bit is the summary bit for the QUEStionable:ERRors:FDD register.
9	512	TA2000 Summary bit	This bit is the summary bit for the QUEStionable:ERRors:TA2000 register.
8	256	CDMA Summary bit	This bit is the summary bit for the QUEStionable:ERRors:CDMA register.
7	128	DIGital2000 Summary bit	This bit is the summary bit for the QUEStionable:ERRors:DIGital2000 register.
6	64	DIGital95 Summary bit	This bit is the summary bit for the QUEStionable:ERRors:DIGital95 register.
5	32	TA136 Summary bit	This bit is the summary bit for the QUEStionable:ERRors:TA136 register.
4	16	DIGital136 Summary bit	This bit is the summary bit for the QUEStionable:ERRors:DIGital136 register.
3	8	AMPS Summary bit	This bit is the summary bit for the QUEStionable:ERRors:AMPS register.

STATus:QUEStionable

Bit Number	Binary Weighting	Condition	Description
2	4	GSM Summary bit	This bit is the summary bit for the QUEStionable:ERRors:GSM register.
1	2	COMMon Summary bit	This bit is the summary bit for the QUEStionable:ERRors:COMMon register.
0	1	Extension Bit	This bit is always 0.

Program Example - STATus:QUEStionable:ERRors Condition Register Bit Assignment

```
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:COMMon Condition Register Bit Assignment

The STATus:QUEStionable:ERRors:COMMon register bits are 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	RUI Maskable Messages.	This bit is a 1 when a Maskable Message occurs.
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.

Bit Number	Binary Weighting	Condition	Description
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.
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.

Bit Number	Binary Weighting	Condition	Description
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 Condition Register Bit Assignment

```
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 Tranasition
                                                             !Register for bit 1
```

STATus:QUEStionable:ERRors:GPRS Condition Register Bit Assignment

The STATus:QUEStionable:ERRors:GPRS register bits are used to indicate information about GPRS 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 may query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
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 may 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 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 may 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 may query the Event Register to find out which of these errors occurred.
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 may 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 may 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 may query the Event Register to find out which of these errors occurred.

Bit Number	Binary Weighting	Condition	Description
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 may 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:GPRS Condition Register Bit Assignment

```
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:GPRS:EVENT?" !Queries and clears the Questionable
                                                    !Errors GPRS Event Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:GPRS:CONDITION?" !Queries and clears the Questionable
                                                        !Errors Condition Register
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:GPRS:ENABLE 1024" !Sets the Questionable
                                                         !Errors Enable Register for bit 10
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:GPRS:NTRANSITION 2" !Sets the Questionable Errors
                                                    !GPRS Negative Transition Filter Register
                                                    !for bit 1
OUTPUT 714;"STATUS:QUESTIONABLE:ERRORS:GPRS:PTRANSITION 2" !Sets the Questionable Errors
                                                    !GPRS 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 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.

Bit Number	Binary Weighting	Condition	Description
4	16	Power-up Self Test(s) Failed	This bit is a 1 if the power-up self tests failed.
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 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

Note that only certain bit numbers in the Status Byte Register are applicable to GPRS as indicated in the "Description" column in the table below.

Bit Number	Binary Weighting	Label	Description
7	128	STATus: OPERation	This bit number is not applicable to GPRS. 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	This bit number is not applicable to GPRS. 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 160

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: • 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: • 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.

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: • 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.
```

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 retuned 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.

*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.

*TST?

The *TST?, self-test query, is defined in “IEEE Std 488.2-1992”, 10.38. The *TST? command executes an internal verification self test and returns the self test result:

- 0 - Passed (no test failed and at least one test passed)
- 1 - Failed (one or more tests failed)

*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.

Related Topics

“Data Connection Processing Event Synchronization” on page 153

“Preset Descriptions” on page 73

“Obtaining Identification Information *IDN?” on page 420

RFANalyzer Subsystem

Description

The RFANalyzer command subsystem performs “lower-level” functions that control the Test Set's demodulation receiver. Most of these functions are normally controlled indirectly by commands in other subsystems.

Syntax Diagrams and Command Descriptions

“RFANalyzer” on page 339

RFANalyzer

```
RFANalyzer -> :CONTrol -> :UPLink -> :FREQuency -> :AUTO -> <sp>1|ON|0|OFF
                                                         -> ? (returns 1|0)

RFANalyzer -> :MANual -> :UPLink -> [:MFRequency] -> <sp><num value>[HZ|KHZ|MHZ|GHZ]
                                                  -> ? (returns num value)
                                 -> :FREQuency -> <sp><num value>[HZ|KHZ|MHZ|GHZ]
                                               -> ? (returns num value)
```

"Diagram Conventions" on page 160

RFANalyzer:CONTrol:UPLink:FREQuency:AUTO

Function	Sets/queries whether the test set's demodulation receiver is set to automatic (AUTO ON) or manual (AUTO OFF) uplink frequency control.
Setting	Range: 1 | ON | 0 | OFF
Query	Range: 1 | 0
*RST setting	1 |ON

Programming Example

```
OUTPUT 714;"RFANalyzer:CONTrol:UPLink:FREQuency:AUTO OFF" !The test set's demodulation
                                                           !receiver is set to manual
                                                           !uplink frequency control.
```

RFANalyzer:MANual:UPLink[:MFRequency]

Function	Sets/queries the test set's demodulation receiver frequency, used to demodulate information from the mobile's reverse channel transmission.
Setting	Range: 292.5 MHz to 2700 MHz Resolution: 1 Hz
Query	Range: 292.5 MHz to 2700 MHz
*RST setting	896.000 MHz

Programming Example

```
OUTPUT 714;"RFANalyzer:MANual:UPLink:MFRequency 1955.030 MHz" !Enables manual
                                                         !demodulation receiver control
                                                         !and sets the test set's
                                                         !demodulation receiver
                                                         !frequency to 1955.030 MHz.
```

RFANalyzer:MANual:UPLink:FREQuency

Function	Sets/queries the test set's demodulation receiver frequency used to demodulate information from the mobile's reverse channel transmission when manual mode is selected (RFANalyzer:CONTrol:MEASurement:FREQuency:AUTO OFF).
Setting	Range: 292.5 MHz to 2700 MHz Resolution: 1 Hz
Query	Range: 292.5 MHz to 2700 MHz Resolution: 1 Hz
*RST setting	896.000 MHz

Programming Example

```
OUTPUT 714;"RFANalyzer:MANual:UPLink:FREQuency 942.6 MHZ" !Sets the test set's demodulation
                                                     !receiver frequency to 942.6 MHz.
```

CALibration Subsystem

Description

The only user calibration that can be performed is for the IQ modulator. This calibration is required if the Baseband Generator or the Vector Output modules are serviced or swapped. The CALibration:IQ subsystem should not be used as part of frequent (i.e. daily, weekly or monthly) test set calibration.

Syntax Diagram and Command Descriptions

"CALibration" on page 343

CALibration

```
CALibration ─┬─> :IQ ─┬──────┬─> ? (returns 0 for pass or -340 for fail) ──┬─>
             │        └>[:1]─┘                                            │
             ├─> :IQ2? (returns 0 for pass or -340 for fail) ─────────────┤
             │                                                            │
             └─> :DATE ─┬─> <sp><YYYY,MM,DD> ─────────────────────────────┤
                        └─> ? ────────────────────────────────────────────┘
```

“Diagram Conventions” on page 160

CALibration:IQ[:1]?

Function	Sets/queries the calibration of the IQ modulator for RF generator 1. It takes some time to complete calibration and can’t be aborted except by cycling the power switch. • Calibrates the IQ modulator for RF generator 1. • Returns a value indicating success or failure of calibration.
Query	Range • 0 = Pass • –340 = Fail
Programming Example	

```
OUTPUT 714;”CALIBRATION:IQ1?”  !Performs a calibration of the IQ modulator
                               !for RF generator 1 and returns 0 or -340.
```

NOTE When the calibration is done the test set display will display:

IQ Calibration completed successfully for modulator 1.

CALibration:IQ2?

Function	Sets/queries the calibration of the IQ modulator for RF generator 2. It takes some time to complete calibration and can't be aborted except by cycling the power switch. • Calibrates the IQ modulator for RF generator 2. • Returns a value indicating success or failure of calibration.
Query	Range • 0 = Pass • –340 = Fail

Programming Example

```
OUTPUT 714;"CALIBRATION:IQ2?" !Performs a calibration of the IQ modulator
                              !for RF generator 2 and returns 0 or -340.
```

NOTE When the calibration is done the test set display will display:

IQ Calibration completed successfully for modulator 2.

CALibration:DATE

Function	Sets/queries the date of the last system calibration done to the test set, not the IQ calibration date. Returns a comma separated list YYYY,MM,DD in that order.
Setting	Sets the system calibration date. Range • Year = 0000 to 9999 • Month = 01 to 12 • Day = 01 to 31
Query	Returns the date when system calibration was performed. Range • Year = 0000 to 9999 • Month = 1 to 12 • Day = 1 to 31

Programming Example

```
OUTPUT 714;"CALIBRATION:DATE 1999,01,04" !Sets the date of the last system
                                         !calibration year, month and day.
```

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.

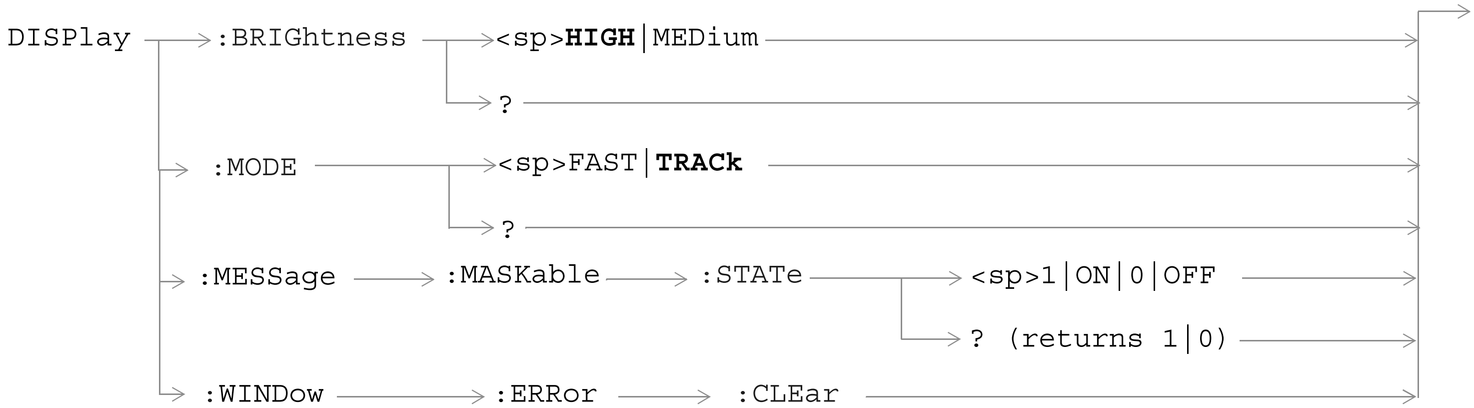
Display Backlight Dimming

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" on page 346

DISPlay



“Diagram Conventions” on page 160

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 345.
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)
Programming Example	
`OUTPUT 714;”DISPLAY:BRIGHTNESS MEDIUM” !Sets display brightness to medium.`	

DISPlay:MODE

Function	Sets/queries the test set's display mode. See "Display Mode (Track/Fast)" on page 427.
Setting	Range: FAST | TRACK
Query	Range: FAST | TRAC
*RST setting	TRACK
Programming Example `OUTPUT 714;"DISPLAY:MODE FAST" !Sets display mode to fast.`	

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.
Setting	Range: On | Off
Query	Range: On | Off
Factory setting	On
Programming Example `OUTPUT 714;"DISPLAY:MESSAGE:MASKABLE:STATE OFF" !Prevents certain messages from appearing` `!on the display.`	

DISPlay:WINDow:ERRor:CLEar

Function	Clears the error message from the display screen but not from the Message Log.
Programming Example `OUTPUT 714;"DISPLAY:WINDOW:ERROR:CLEAR" !Clears an error message from the display.`	

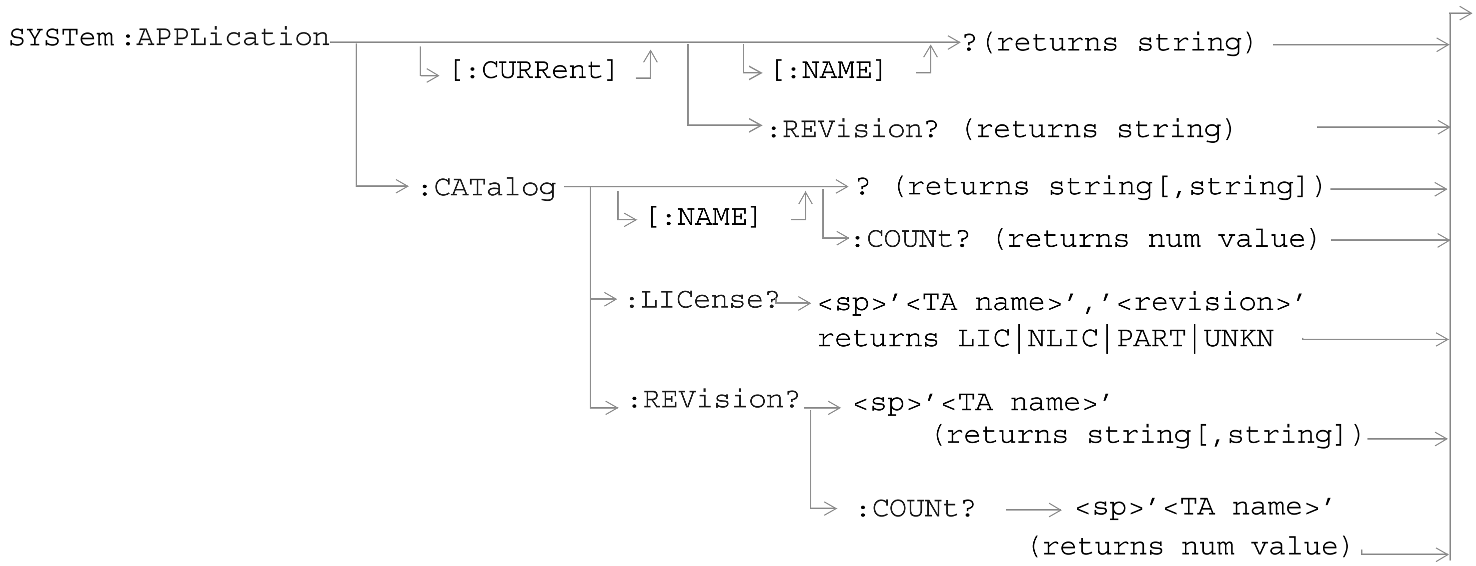
SYSTem Subsystem

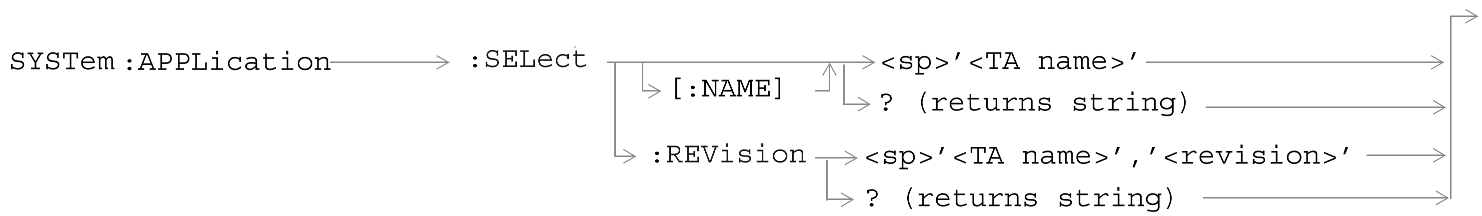
Description

The SYSTem subsystem collects the functions that are not related to test set performance. Examples include functions for performing general housekeeping and functions related to setting global configurations, such as TIME or CORRection (amplitude offset).

Syntax Diagrams and Command Descriptions

SYSTem:APPLication





"Diagram Conventions" on page 160

SYSTem:APPLication[:CURRent][:NAME]?

Function	Queries the test set for the name of the currently running protocol application.
Query	Range: A string up to 25 characters including null. See "SYSTem:APPLication:CATalog[:NAME]?" on page 350.
Programming Example	
`OUTPUT 714;"SYSTEM:APPLICATION:CURRENT:NAME?"`	

SYSTem:APPLication[:CURRent]:REVision?

Function	Queries the test set for the currently running protocol application revision number.
Query	Range: Any string up to 20 characters including null. A typical example would be A.01.20 for a licensed version.
Programming Example	
`OUTPUT 714;"SYSTEM:APPLICATION:CURRENT:REVISION?"`	

SYSTem:APPLication:CATalog[:NAME]?

Function	Queries the test set for all of the names of the protocol applications stored on the hard drive. This query returns one or more strings, each string is separated by a comma.
Query	Range: • GPRS Protocol App
Programming Example	
`OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME?"`	

SYSTem:APPLication:CATalog[:NAME]:COUNt?

Function	Queries the test set for the total number protocol application names stored on the hard drive. Up to 30 protocol applications can be stored.
Query	Range: 0 through 30
Programming Example	
`OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME:COUNT?"`	

SYSTem:APPLication:CATalog:LICense? Ô<protocol application name>Õ,Ô<revision>Õ

Function	Queries the license status for a selected revision. The query must include two strings separated by a comma. The protocol application name and revision must be entered as they appear in the protocol 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. The returned values are: • “LIC” indicates this is a licensed protocol application. • “NLIC” indicates this is not a licensed protocol application. • “PART” only part of the protocol application with multiple radio formats is licensed • “UNKN” indicates that license status is unknown.
Query	Range: LIC | NLIC | PART | UNKN
Programming Example `OUTPUT 714;”SYSTEM:APPLICATION:CATALOG:LICENSE? ‘GPRS Protocol App’,’A.01.20’”`	

SYSTem:APPLication:CATalog:REVision? Ô<protocol application name>Õ

Function	Queries the test set for all of the revision numbers stored on the test set’s hard drive. You must specify a protocol application. The protocol application name must be entered as it appears in the protocol 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.
Query	Range: One or more comma separated strings or a null string
Programming Example `OUTPUT 714;”SYSTEM:APPLICATION:CATALOG:REVISION? ‘GPRS Protocol App’”`	

SYSTem:APPLication:CATalog:REVision:COUNt? Ô<protocol application name>Õ

Function	Queries the test set for the number of revisions present on the hard disk for a specified protocol application. Up to 30 revisions can be stored for a protocol application. The protocol application name must be entered as it appears in the protocol 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.
Query	Range: 0 through 30
Programming Example `OUTPUT 714;”SYSTEM:APPLICATION:CATALOG:REVISION:COUNT? ‘GPRS Protocol App’”`	

SYSTem:APPLication:SELect[:NAME] Ô<protocol application name>Õ

Function	Selects a protocol application and reboots the test set. This will switch the protocol application to the revision already selected. There is no need to re-select the revision before switching. The reboot process takes about 1 minute. Queries the test set for the protocol application that is selected and will run after the next reboot of the test set. The protocol application name must be entered as it appears in the protocol 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. **NOTE** Selecting the correct name and the desired revision of a protocol application is important. This information should be reviewed before proceeding. The directions for how to determine protocol application name and revision are found in this document.
Setting	Range: See "SYSTem:APPLication:CATalog[:NAME]?" on page 350.
Query	Range: See "SYSTem:APPLication:CATalog[:NAME]?" on page 350.
Programming Example `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME 'GPRS Protocol App'"` `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME?"`	

SYSTem:APPLication:SELect:REVision Ô<protocol application name>Õ,Õ<revision>Õ

Function	Selects a protocol application revision and a protocol application. The revision does not need to be set in order to switch protocol applications. The only time you select revisions is to change revisions. Queries the test set for the revision of a specified protocol application. The protocol application name and revision must be entered as they appear in the protocol 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.
Setting	Range: A valid protocol application name and revision number for any licensed protocol application.
Query	Range: A string up to 20 characters, or the null string.
Programming Example `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION 'GPRS Protocol App','A.01.20'"` `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION? 'GPRS Protocol App'"`	

Related Topics

"Protocol Application Revisions and Licenses" on page 438

"Protocol Application Name" on page 440

SYSTem:BEEPer

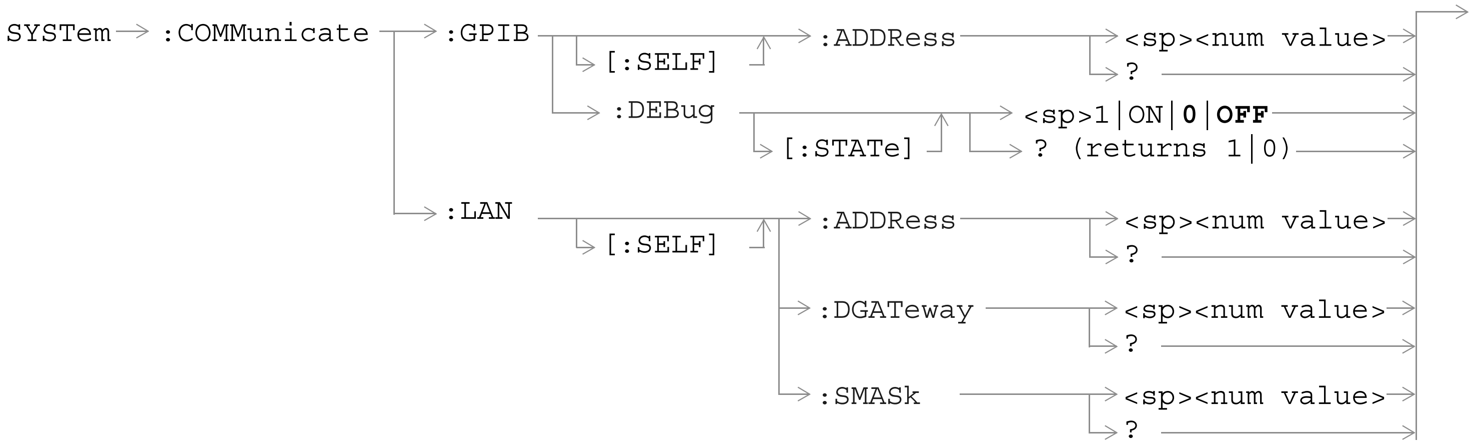
```
SYSTem——:BEEPer ——> :STATe ——┬——> <sp>1|ON|0|OFF ——> 
                             └——> ? (returns 1|0) ——>
```

“Diagram Conventions” on page 160

SYSTem:BEEPer:STATe

Function	Sets/queries the beeper state of the test set.
Setting	Range: 0|OFF | 1|ON
Query	Range: 0|1
*RST Setting	1 (on)
Programming Example `OUTPUT 714;"SYSTEM:BEEPER:STATE OFF" !Sets beeper state to off.`	

SYSTem:COMMunicate



“Diagram Conventions” on page 160

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.)
Related Topics	"Configuring the Test Set's GPIB Address" on page 432
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 on 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 379 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	Range: 0|1
*RST setting	0 (OFF)
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 357. 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)
Related Topics	“LAN IP Address” on page 430
Programming Example `OUTPUT 714;"SYSTEM:COMMUNICATE:LAN:SELF:ADDRESS '130.015.156.255'" !Sets the !LAN IP !address.`	

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.)
Programming Example `OUTPUT 714;"SYSTEM:COMMUNICATE:LAN:SELF:DGATEWAY '130.2.6.200'"`	

SYSTem:COMMunicate:LAN[:SELF]:SMASk

Function	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. If A is less than or equal to 127, the subnet mask is 255.0.0.0. If A is greater than 127 and less or equal to 191, the subnet mask is 222.255.0.0. If A is grater than 191, the subnet mask is 255.255.255.0. 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,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.)
Programming Example `OUTPUT 714;"SYSTEM:COMMUNICATE:LAN:SELF:SMASK '255.2.6.200''"`	

SYSTem:CONFigure

```
SYSTem → :CONFigure → :INFormation → :HARDware → :VERBose? → (returns model number,
                                                             serial number, revision
                                                             number, board ID and
                                                             Cal file information) →
```

"Diagram Conventions" on page 160

SYSTem:CONFigure:INFormation:HARDware:VERBose?

Function	Queries the manufacturer, model number, model number of the protocol 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. For an example of how to use this command, see "Hardware Configuration Report" on page 421.
*RST Setting	Resets have no effect on this information. The information is gathered during the power up cycle.

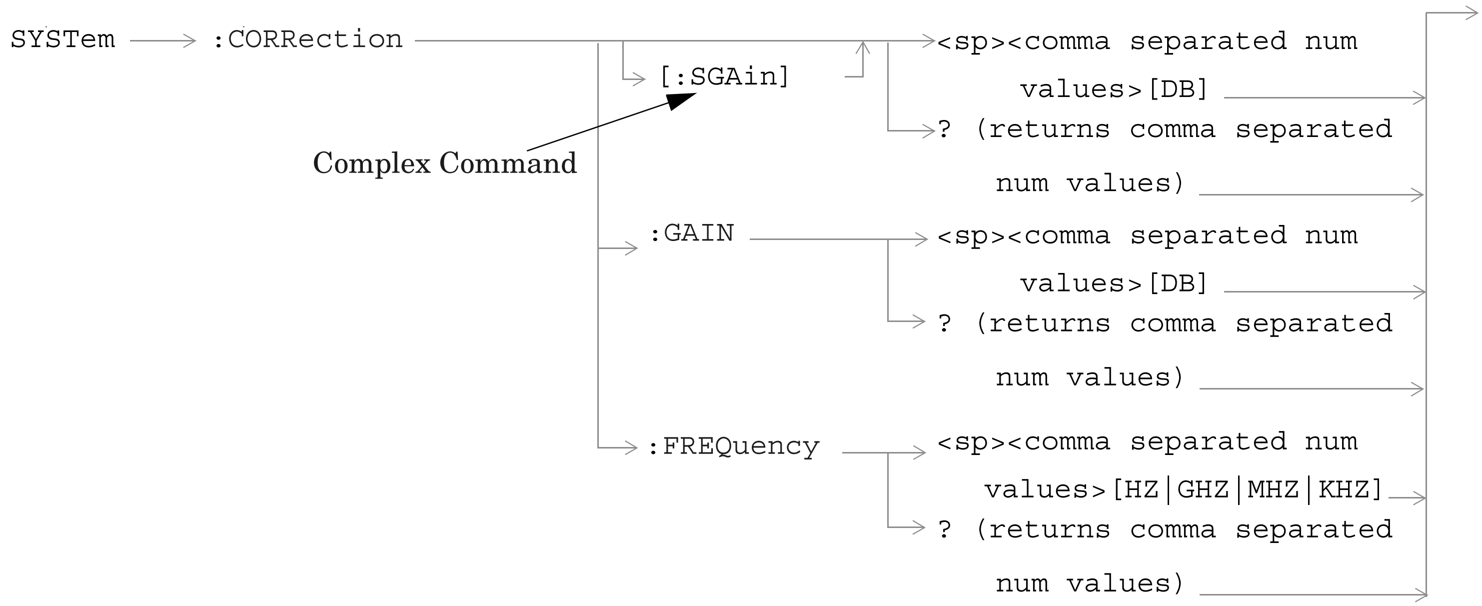
Related Topics

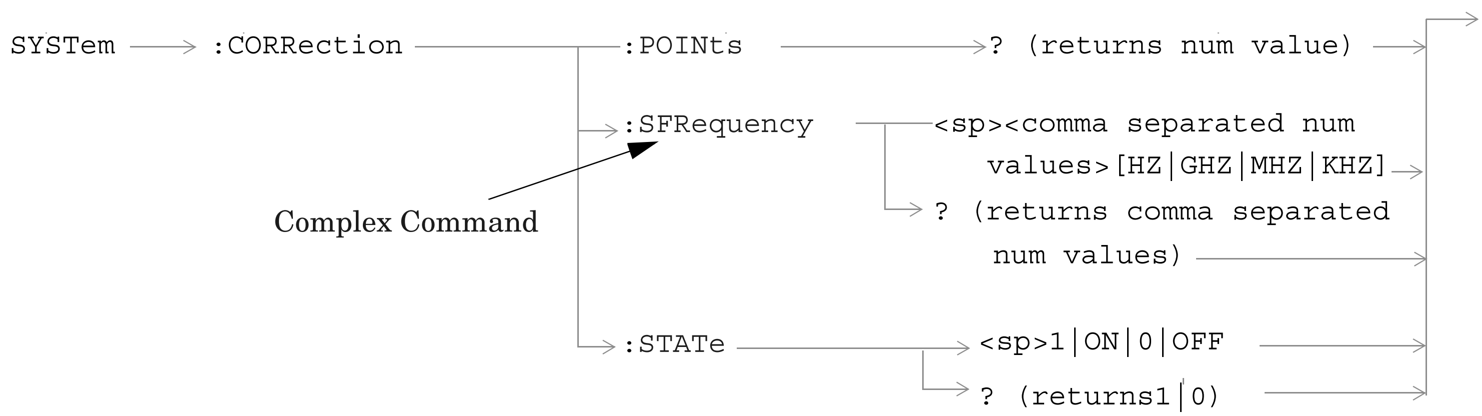
"Hardware Configuration Report" on page 421

"SYSTem:CURRent:TA" on page 365

"Obtaining Identification Information *IDN?" on page 420

SYSTem:CORRection





“Diagram Conventions” on page 160

SYSTem:CORRection:[:SGAin]

Function	Sets/queries the up to 20 comma separated offset values in dB. This command sets the state to On. See “Amplitude Offset” on page 433. The units, dB, are optional. If no units are specified then units default to dB. Sending a null list (no values) sets the state of all offsets to Off.
Setting	Range: 0 to 20 values between –100 to +100 Resolution: 0.01
Query	Range: 1 to 20 values between –100 to +100, and NAN (9.91E+37) Resolution: 0.01
Factory Setting	Offsets 1 through 20, are set to 0.00 dB, state is set to Off

Programming Example

```
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
```

SYSTem:CORRection:FREQuency

Function	Sets/queries up to 20 comma separated frequency values in MHz. The units, (GHz, MHz, kHz, Hz) are optional. If no units are specified, units default to Hz. See “Amplitude Offset” on page 433. Sending a null list (no values) sets the state of all frequencies to Off.
Setting	Range: 0 to 20 comma separated values ranging from 292.5 MHz to 2700 MHz Resolution: 1 Hz
Query	Range: 1 to 20 comma separated values ranging from 292.5 MHz to 2700 MHz, and NAN (9.91E+37) Resolution: 1 HZ

Factory Setting	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

Programming Example

```
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
```

SYSTem:CORRection:GAIN

Function	Sets/queries the up to 20 comma separated offset values in dB. See “Amplitude Offset” on page 433. The units, dB, are optional. If no units are specified, units default to dB. Sending a null list (no values) sets the state of all offsets to Off.
Setting	Range: 0 to 20 values between –100 to +100 Resolution: 0.01
Query	Range: 1 to 20 values between –100 to +100, and NAN (9.91E+37) Resolution: 0.01
Factory Setting	Offsets 1 through 20, are set to 0.00 dB, state is set to off

Programming Example

```
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
```

SYSTem:CORRection:POINts

Function	Queries the number of offsets that are in their On state when the RF IN/OUT Amplitude Offset State is also set to On. See “Amplitude Offset” on page 433.
Query	Range: 1 to 20, and NAN (9.91E+37) Resolution: 1

Programming Example

```
OUTPUT 714;”SYSTEM:CORRECTION:POINTS?”
!Returns the number of frequencies and offsets
!with their state set to On
```

SYSTem:CORRection:SFRequency

Function	Sets/queries up to 20 comma separated frequency values in MHz. This command sets the state to On. The units (GHz, MHz, kHz, Hz) are optional. If no units are specified, units default to MHz. See “Amplitude Offset” on page 433. Sending a null list (no values) sets the state of all frequencies to Off.
Setting	Range: 0 to 20 comma separated values from 292.5 MHz to 2700 MHz Resolution: 1 Hz

Query	Range: 1 to 20 comma separated values from 292.5 MHz to 2700 MHz, and NAN (9.91E+37) Resolution: 1 HZ
Factory Setting	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

Programming Example

```
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
```

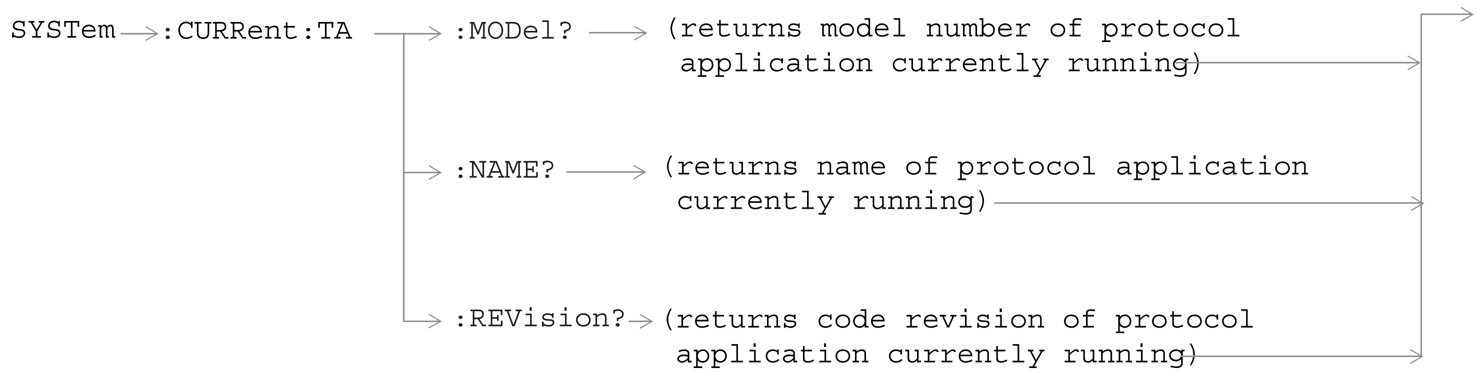
SYSTem:CORRection:STATe

Function	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. 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. Setting any of the frequency or offset states to On will set the RF IN/OUT Amplitude Offset State to On. See "Amplitude Offset" on page 433.
Setting	Range: 0|OFF | 1|ON
Query	Range: 0|1
Factory Setting	0 (off)

Programming Example

```
OUTPUT 714;"SYSTEM:CORRECTION:STATE ON" !Sets the RF IN/OUT
                                        !Amplitude Offset State to On
```

SYSTem:CURRent:TA



"Diagram Conventions" on page 160

SYSTem:CURRent:TA:MODel?

Function	Queries the model number of the protocol 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

SYSTem:CURRent:TA:NAME?

Function	Queries the name of the protocol application running. Printable ASCII characters up to a 25 character string. This is not the recommended command, see "SYSTem:APPLication" on page 349 for the recommended command.
Query	Range: ASCII codes 32 - 126 decimal excluding comma and semicolon
*RST Setting	non volatile, read from the test set's hard disk

SYSTem:CURRent:TA:REVision?

Function	Queries the coordinated codeware revision for the protocol application running. Printable ASCII characters up to a 20 character string. This is not the recommended command, see "SYSTem:APPLication" on page 349 for the recommended command.
Query	Range: ASCII codes 32 - 126 decimal excluding comma and semicolon
*RST Setting	non volatile, read from the test set's hard disk.

SYSTem:DATE

```
SYSTem——:DATE ——> <sp><year>,<month>,<day>
               └——> ? (returns <year>, <month>, <day>)
```

"Diagram Conventions" on page 160

SYSTem:DATE

Function	Sets/queries the date.
Setting	Range: • <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	Range: • <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.
Programming Example `OUTPUT 714;"SYSTEM:DATE 2001,9,27" !Sets the date to September 27,2001.` `OUTPUT 714;"SYSTEM:DATE?" !Returns "+2001,+9,+27" if the date has been set to September 27,2001.`	

Related Topics

"SYSTem:UTC:DATE"

SYSTem:ERRor?

```
SYSTem ──> :ERRor? ──> (returns contents of error/event queue) ──>
```

"Diagram Conventions" on page 160

SYSTem:ERRor?

Function	Queries the contents of the Error/Event Queue. The Error/Event Queue may contain one or more messages with an error or event description. 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 379.
Query	Error/Event Queue • Range: 0 to 100 messages up to 255 characters in length

SYSTem:MEASurement

```
SYSTem ——> :MEASurement ——> :RESet ————————————————————————————>
```

“Diagram Conventions” on page 160

SYSTem:MEASurement:RESet

Function	Any measurement results are cleared and the Integrity Indicator is set to 1 (No_Result_Available).
Setting	These results are set to their default values: • Block Error Rate (BLER) • Blocks Tested
Programming Example `OUTPUT 714;”SYSTEM:MEASUREMENT:RESET” !Resets current measurements.`	

SYSTem:PRESet

```
SYSTem ──> :PRESet[1] ─────────────────────────────────────────> ─┐
       │                                                          ├──>
       ├─> :PRESet2 ──> (full preset) ────────────────────────────>┤
       │                                                          │
       └─> :PRESet3 ──> (partial preset) ─────────────────────────>┘
```

"Diagram Conventions" on page 160

SYSTem:PRESet[1] (not recommended for use)

<table>
<tr><td>Function</td><td>Not recommended for use at this time, use the SYSTEM:PRESET3 command for partial preset.
Performs a partial preset. This is the recommended command when you want to change from remote operation to manual operation and a partial preset is needed.
Any call in process is disconnected.</td></tr>
<tr><td>Related Topics</td><td>See "Partial Preset" on page 73 for more details</td></tr>
<tr><td colspan="2">Programming Example
<code>OUTPUT 714;"SYSTEM:PRESET" !Partial preset when changing from remote to manual operation.</code></td></tr>
</table>

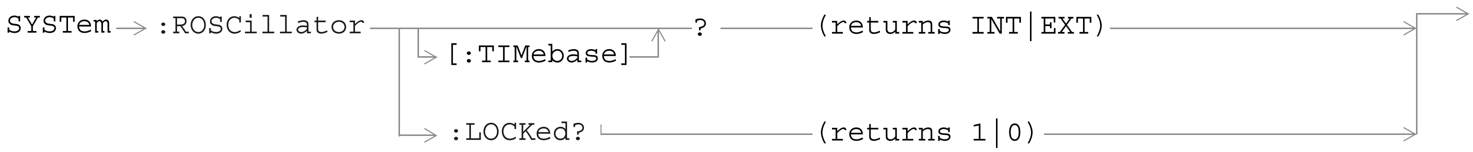
SYSTem:PRESet2

<table>
<tr><td>Function</td><td>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.
All parameters are set to their default values.</td></tr>
<tr><td>Related Topics</td><td>See "Full Preset" on page 74 for more details.</td></tr>
<tr><td colspan="2">Programming Example
<code>OUTPUT 714;"SYSTEM:PRESET2" !Full preset.</code></td></tr>
</table>

SYSTem:PRESet3

<table>
<tr><td>Function</td><td>Performs a partial preset. This is the recommended command when a partial preset is needed during remote operation of the test set.
Any call in process is disconnected.</td></tr>
<tr><td>Related Topics</td><td>See "Partial Preset" on page 73 for more details.</td></tr>
<tr><td colspan="2">Programming Example
<code>OUTPUT 714;"SYSTEM:PRESET3" !Partial preset when in remote operation.</code></td></tr>
</table>

SYSTem:ROSCillator



"Diagram Conventions" on page 160

SYSTem:ROSCillator[:TIMebase]?

Function	Query to indicate if the test set's internal source or a suitable external source has been chosen to drive the test set's time base. A suitable external source must have: • an output level of 0 to +13DBM • frequency of 10 MHZ
Query	Range: • INT = internal source • EXT = external source

SYSTem:ROSCillator:LOCKed?

Function	Query the status of the reference oscillator and indicate if it is locked or unlocked.
Query	Range: • 0 = unlocked • 1 = locked

SYSTem:SYNChronized

```
SYSTem ──> :SYNChronized ──────────────────────────────────────> 
                                   │
                                   └──> ?  ────(returns 1) ────> 
```

"Diagram Conventions" on page 160

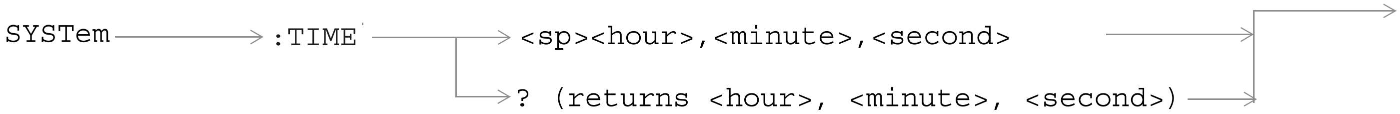
SYSTem:SYNChronized

Function	Sets/queries the test set that all prior sequential commands have completed and all prior overlapped commands have started indicating that the input buffer is synchronized. (See "Data Connection Processing Event Synchronization" on page 153.)
Setting	Bit 12 of the status operation condition register is pulsed. See "STATus:OPERation:CALL Condition Register Bit Assignment" on page 307.
Query	1
Related Topics	See "Status Subsystem Overview" on page 131. See "Data Connection Processing Event Synchronization" on page 153.

Programming Example

```
OUTPUT 714;"SYSTEM:SYNCHRONIZED" !Pulses bit 12 of the status operation
                                 !condition register.
OUTPUT 714;"SYSTEM:SYNCHRONIZED?" !Returns a 1 indicating all prior sequential
                                  !commands have completed and all overlapped
                                  !commands have started.
```

SYSTem:TIME



“Diagram Conventions” on page 160

SYSTem:TIME

Function	Sets/queries the local time of day. 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. Changes to time zone will cause changes to local time, but will not directly affect UTC time.
Setting	Range: • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 **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.
Query	Range: • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 **NOTE** The resolution of the local time setting is minutes. The value returned for <second> will not provide useful information.
*RST Setting	This feature is not affected by instrument preset.
Programming Example `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.`	

Related Topics

“SYSTem:UTC[:TIME]”

“SYSTem:TZONe”

SYSTem:TZONe

```
SYSTem :TZONe  <sp><hour>,<minute>
               ? (returns <hour>, <minute>)
```

“Diagram Conventions” on page 160

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: • <hour> -12 to +15 • <minute> 0 to 59
Query	Range: • <hour> -12 to +15 • <minute> 0 to 59
*RST Setting	This feature is not affected by instrument preset.

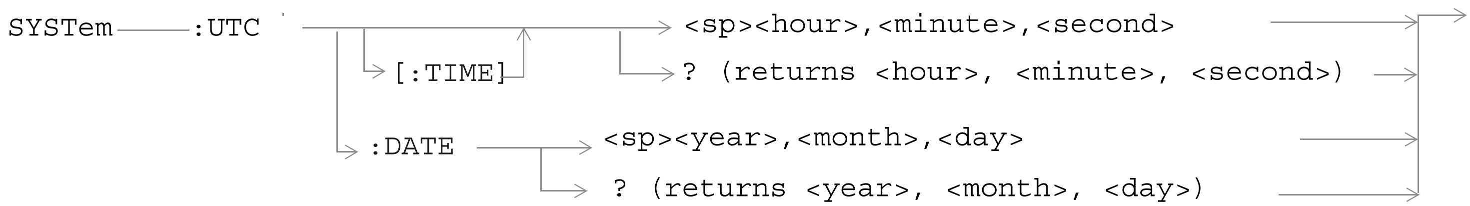
Programming Example

```
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 160

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	Range: • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 **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.
Query	Range: • <hour> 0 to 23 • <minute> 0 to 59 • <second> 0 to 59 **NOTE** The resolution of the UTC time setting is minutes. The value returned for <second> will not provide useful information.
*RST Setting	This feature is not affected by instrument preset.
Programming Example `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.`	

SYSTem:UTC:DATE

Function	Sets/queries the Universal Coordinated Time (UTC) date. (UTC is also known as UCT, Zulu, and Greenwich Mean Time.)
Setting	Range: • <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	Range: • <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

Programming Example

```
OUTPUT 714;"SYSTEM:UTC:DATE 2001,9,27" !Sets the UTC date to September 27,2001.

OUTPUT 714;"SYSTEM:UTC:DATE?" !Returns "+2001,+9,+27" if the UTC date has been set to
September 27,2001.
```

Related Topics

“SYSTem:DATE”

“SYSTem:TIME”

5 Troubleshooting

Troubleshooting the E6900A Using Internal Loopback Mode

Description

If you suspect a problem with the test set, a self test can be performed to verify operation. Run this self test if failing customer tests, experience dropped calls or can not establish a connection to the phone.

Internal Modulation Accuracy Loopback will test each RF Source over a wide frequency and amplitude range using continuous GSM modulation. The RF Output from each source will be internally connected to the RF Analyzer to verify that both RF Sources and the Receiver are functioning properly. The test can be run two different ways, see "Run the Test" below. Test time is approximately 90 seconds followed by a Pass / Fail indication on the screen. The Pass /Fail indication can also be viewed in the Message Log. A detailed result file of the self test's data points can be retrieved two different ways, see "Data Retrieval" below. At completion of the self test the instrument is placed in a full preset state.

Run the Test

The self test can be run either from the front panel or via GPIB control. Test time is approximately 90 seconds followed by a Pass / Fail indication on the screen. The Pass /Fail indication can also be viewed in the Message Log.

- From the front panel:
  1. Press the **SYSTEM CONFIG** key.
  2. Press the **More** key.
  3. Select the `Self Test`.
- GPIB control:

  Execute the *TST? command.

Data Retrieval

A detailed result file of the self test's data points is saved on the instrument's hard drive and is retrievable via FTP or a Web Browser.

- FTP method:

  FTP to the instrument, the file is in the following location:
  /ide0/www/SELFTEST.TXT

- WEB method:

  Open a web browser to the URL of the instrument as follows:
  http://(Instruments LAN IP)/selftest.txt

Related Topics

"*TST?" on page 337

"-300 to -399 SCPI Specified Device-Specific Errors" on page 389

Error Messages

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.

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.
```

GPRS Mobile Test Maskable Messages

- Protocol warning; Setting change has terminated the link with the DUT.

Related Topics

"SYSTem:COMMunicate:GPIB:DEBug[:STATe]" on page 356

"Test Set Beeper" on page 428

"SYSTem:ERRor?" on page 367

"DISPlay:WINDow:ERRor:CLEar" on page 347

"DISPlay:MESSage:MASKable:STATe" on page 347

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" on page 379

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 application.	This function is used in another 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.

GPRS Mobile Test Manual User Messages

These messages are maskable so that they can be blocked from appearing on the display. See “Error Messages” on page 379.

Message	Description
GSM measurement warning; TX power measurement has been closed GPRS measurement warning; TX power measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; Power vs time measurement has been closed GPRS measurement warning; Power vs time measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; Phase frequency error measurement has been closed GPRS measurement warning; Phase frequency error measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; Output RF spectrum measurement has been closed GPRS measurement warning; Output RF spectrum measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; Fast bit error measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; Bit error measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; Decoded audio measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
GSM measurement warning; IQ tuning measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.
Protocol warning; Setting change has terminated the link with the DUT	Indicates that a user setting has caused the link with the device under test (DUT) to be dropped. (For example, this may occur if you change the ETSI Test Mode Type parameter while the data connection status is Transferring.)

-400 to -499 Query Errors

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 to -399 SCPI Specified Device-Specific Errors

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.
-360 Communication error	This is the generic communication error for devices that cannot detect the more specific errors described for error -361 through -363.

-300 to -399 SCPI Specified Device-Specific Errors

Error Message	Description
-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.

Related Topics

"Standard Event Status Register" on page 333

-200 to -299 Execution Errors

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.
-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.

-200 to -299 Execution Errors

Error Message	Description
-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.
-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.

Error Message	Description
-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 4882, 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 count 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 to -199 Command Errors

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 that 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 to -199 Command Errors

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, and 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.

Related Topics

"Standard Event Status Register" on page 333

+100 to +199 Core Device-Specific Error

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>	<message1> will appear as: If the DSP generated the assert: ;P:DSP T:<task ID> E:<error code> C:<error classif.> F1:<flag 1> F2:<flag 2> If the Protocol processor generated the assert: ;P:Protocol T:<task ID> L:<line number> F:<file name> If the Host processor generated the assert: ;P:Host T:<task ID> L:<line number> F:<file name>
+102 Exception; Cycle power. Exception message<message2>	<message2> will appear as: T:<task ID> or V:<vector number> or PC:<program counter> or DA:<data adrs reg value>. Vector number, program counter and data address register values are hexadecimal format.
+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 measurements or settling operations will take place	Indicates none of the VI's are operational because a serious problem exists.
+105 Failure; No settings 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 application	The application selected is not available for this test set.
+131 Configuration error; Current application is not licensed (License = N). Select another application	The application selected is not licensed. Select another revision or application that is licensed (License = L).
+132 Configuration error; Selected Application Format is not available.	Indicates that the fast switching operation will not activate a particular radio format. Check the revision number of the application associated with the radio format, does the revision correspond with what the fast switching application needs?

+100 to +199 Core Device-Specific Error

Error Message	Description
+133 Configuration error; Selected Application Format is not licensed, (License = N).	The radio format selected is not licensed. Select another revision or obtain a licensed revision of the application that is licensed (License = L).
+134 Configuration error; Unable to switch to selected Application Format	The 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 protocol 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 to +299 Call Processing Device-Specific Error

These errors are generated when a problem occurs maintaining the link between the test set and the DUT. These errors generally occur as a result of a problem on the link such as if the DUT did not respond to a message, or the user attempted to perform an invalid operation in the current instrument state.

Errors with a description beginning with “GSM call disconnected” mean that the call is dropped when the error occurs. Errors beginning with “GSM protocol failure” mean that the call is not necessarily dropped, these are informational messages.

Error Message	Description
+201 GSM call disconnected; Radio link failure (Timer T100 expiry)	“Fixed Timer Messages” on page 383
+202 GSM call disconnected; Immediate assignment failure (Timer T3101 expiry)	“Fixed Timer Messages” on page 383
+203 GSM call disconnected; Handover failure (Timer T3103 expiry)	“Fixed Timer Messages” on page 383
+204 GSM call disconnected; Channel assignment failure (Timer T3107 expiry)	“Fixed Timer Messages” on page 383
+205 GSM call disconnected; No response to page (Timer T3113 expiry)	“Fixed Timer Messages” on page 383
+206 GSM call disconnected; No answer (Timer T301 expiry)	“Fixed Timer Messages” on page 383
+207 GSM call disconnected; No response to setup (Timer T303 expiry)	“Fixed Timer Messages” on page 383
+210 GSM call disconnected; No response to release 2 times (Timer T308 expiry)	“Fixed Timer Messages” on page 383
+211 GSM call disconnected; No alert from mobile (Timer T310 expiry)	“Fixed Timer Messages” on page 383
+212 GSM call disconnected; No response to connect (Timer T313 expiry)	“Fixed Timer Messages” on page 383
+213 GSM call disconnected; Data link failure (Timer T200 expiry)	“Fixed Timer Messages” on page 383
+214 GSM call disconnected; Physical information repetition failed (Timer T3105 expiry)	“Fixed Timer Messages” on page 383
+217 GSM call disconnected; TMSI (Temporary Mobile Subscriber Identity) reallocation failed (Timer T3250 expiry)	“Fixed Timer Messages” on page 383
+218 GSM call disconnected; Authentication failed (Timer T3260 expiry)	“Fixed Timer Messages” on page 383

+200 to +299 Call Processing Device-Specific Error

Error Message	Description
+219 GSM Call disconnected; Mobile not capable of supporting the selected Channel Mode	Indicates that the mobile station cannot support the requested channel mode.
+220 GSM call processing failure; (Call processing not available	Indicates the BS Emulator VI cannot be instantiated.
+230 GSM operation rejected; Call processing disabled	Indicates an attempt to perform a BS Emulator action when the BS emulator VI is inactive.
+231 GSM/GPRS operation rejected; Attempting to set MCC while generating a BCH	Indicates that the Cell Activated State is still On. The Cell Activated State must be turned Off before setting the MCC.
+232 GSM/GPRS operation rejected; Attempting to set LAC while generating a BCH	Indicates that the Cell Activated State is still On. The Cell Activated State must be turned Off before setting the LAC.
+233 GSM/GPRS operation rejected; Attempting to set BCC while generating a BCH	Indicates that the Cell Activated State is still On. The Cell Activated State must be turned Off before setting the BCC.
+234 GSM/GPRS operation rejected; Attempting to set NCC while generating a BCH	Indicates that the Cell Activated State is still On. The Cell Activated State must be turned Off before setting the NCC.
+235 GSM/GPRS operation rejected; Attempting to set MNC while generating a BCH	Indicates that the Cell Activated State is still On. The Cell Activated State must be turned Off before setting the MNC.
+236 GSM operation rejected; Only one call can be supported at a time	Indicates an attempt at a second call being activated.
+237 GSM operation rejected; Requested TCH Band is invalid in current state	Indicates that there is not an active link between the MS and the test set.
+238 GPRS operation rejected; Attempting to set RAC while generating a BCH	Indicates that the Cell Activated State is still On. The Cell Activated State must be turned Off before setting the RAC.
+239 GPRS operation rejected; Attempting to start ping while data connection type is not IP data	Indicates the CALL:DATA:PING:STARt command was received when the data connection type was not IP Data.
+240 GPRS operation rejected; DUT PDP context request rejected due to invalid DUT IP address	Indicates DUT IP address is invalid. May be address setting, subnet mask, or incorrect LAN IP address.
+241 GPRS operation rejected; DUT PDP context request rejected due to data connection type not being IP data	Indicates PDP context request occurred when the data connection type was not IP Data.
+242 GPRS operation rejected; DUT and instrument are in incompatible states	Indicates that the instrument and the DUT were not able to meet the other's requests.
+243 GPRS operation rejected; Activate PDP context request procedure failed (Timer T3385 expired 5 times)	Context request timed out.

Error Message	Description
+244 GPRS operation rejected; Modify PDP context request procedure failed (Timer T3386 expired 5 times)	Change request for PDP context timed out.
+245 GPRS operation rejected; Deactivate PDP context request procedure failed (Timer T3395 expired 5 times)	Deactivation request timed out.
+246 GPRS operation rejected; Request PDP context activation rejected by DUT	Request to send PDP activation request rejected by DUT.
+250 GSM protocol failure; No response to disconnect (Timer T305 expiry)	"Fixed Timer Messages" on page 383
+251 GSM protocol failure; No response to release (Timer T308 expiry)	"Fixed Timer Messages" on page 383
+252 GSM protocol failure; Channel release failed (Timer T3109 expiry)	"Fixed Timer Messages" on page 383
+253 GSM protocol failure; (Timer T3270 expiry)	"Fixed Timer Messages" on page 383
+254 GSM protocol failure; Unknown identity type received from mobile	Indicates that an identity type other than 1, 2, 3 or 4 was received from the MS.
+255 GSM protocol failure; Unexpected identity type received from mobile	Indicates that the MS has responded with an unexpected identity type. Example MS returned IMSI when IMEI was queried.
+256 GSM protocol failure; Channel assignment exceeded specified number of frames	Indicates that the max frames allowed for assignment parameter should be increased.
+257 GSM call disconnected; Invalid TMSI received from MS	Indicates that some of the bits received were not set to their normal or expected value for a TMSI (Temporary Mobile Subscriber Identity).
+258 GSM protocol failure; Out-of-range for timing advance	Indicates that there is a likely issue with the mobile's protocol board which is causing its timing advance to be out of the expected range.
+259 GPRS protocol failure; Received ACK/NACK for a block that has not been sent to the MS	Indicates that there is a likely issue with the mobile's protocol board as it is responding to messages that haven't been sent.
+260 GSM RR Cause; <cause identifier>	The <cause identifier> is a 4 digit hexadecimal number
+261 GSM MM Cause; <cause identifier>	The <cause identifier> is a 4 digit hexadecimal number
+262 GSM CC Cause; <cause identifier>	The <cause identifier> is a 4 digit hexadecimal number
+270 GSM protocol failure; Cell Change procedure failed	Indicates that the BCH ARFCN or Cell Band was changed while the mobile station was attached (thus initiating a cell change. The mobile station had not completed the cell change procedure after 5 seconds.
+271 GPRS data connection terminated; Data connection failed to start	Indicates that the GPRS test application was unable to start the data connection with the DUT (Device Under Test).

+200 to +299 Call Processing Device-Specific Error

Error Message	Description
+272 GPRS data connection terminated; Detach failure (Timer T3322 expired 5 times)	Indicates that the Detach procedure failed after five attempts. The Data Connection Status will be set to Idle.
+273 GPRS data connection terminated; Attach failure (Timer T3350 expired 5 times)	Indicates that the Attach procedure failed after five attempts. The Data Connection Status will be set to Idle.
+274 GPRS data connection terminated; Routing Area Update failure (Timer T3350 expired 5 times)	Indicates that the Routing Area Update procedure failed after five attempts. The Data Connection Status will not be changed.
+275 GPRS data connection terminated; MS unexpectedly ended TBF	Indicates that the mobile station unexpectedly ended the TBF (temporary block flow).
+276 GPRS data connection terminated; Test set timed out waiting for data from the MS	Indicates that no data was received from the mobile station in the allowed time.
+277 GPRS data connection terminated; MS timed out ACK/NACK exchanges and released the TBF	Indicates that the mobile station timed out ACK (Acknowledged) or NACK (Not Acknowledged) exchanges and released the TBF (temporary block flow).
+278 GPRS data connection terminated; MS did not respond to uplink immediate assignment	Indicates that the mobile station did not respond to the uplink immediate assignment.
+279 GPRS data connection terminated; MS did not respond to downlink immediate assignment	Indicates that the mobile station did not respond to the downlink immediate assignment.
+280 GPRS data connection terminated; Test set timed out waiting for data from the MS	Indicates that the mobile station did not respond to the test set within the allowed time.
+281 GPRS data connection terminated; MS did not respond to packet timeslot reconfigure	Indicates that the mobile station did not respond to a packet timeslot reconfiguration request from the test set.
+286 GPRS data connection terminated; MS did not respond to packet downlink assignment	Indicates that the mobile station did not respond to a packet downlink assignment.
+287 GPRS data connection terminated; MS did not respond to packet uplink	Indicates that the mobile station did not respond to a packet uplink assignment.
+290 GPRS protocol warning; No IMSI received from MS (using default IMSI)	This warning message occurs with some GPRS mobiles and not with others. It is an advisory message only and does not indicate failure of the test set or the mobile.

+300 to +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 333 for information on this register.

Error Message
+303 GSM data link failure; Unsolicited DM response, multiple frame established state
+309 GSM data link failure; N(R) sequence error

+400 to +499 Core Hardware Device-Specific Error

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	
+414 Hardware failure; Fixed external reference output is not responding	

Error Message	Description
+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	

+400 to +499 Core Hardware Device-Specific Error

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| ;ROM BASEBAND GENERATOR 1| ;ROM BASEBAND GENERATOR 2| ;DEMOD DOWNCONVERTER| ;VECTOR OUTPUT BOARD 1| ;VECTOR OUTPUT BOARD 2| ;IVF MEASUREMENT| ;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| ;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| ; 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

Related Topics

"Standard Event Status Register" on page 333

+500 to +599 Application Hardware Device-Specific Error

Description

These errors are generated when a problem occurs with a hardware module that is required for a particular application.

When one of these errors is generated, the '+500 errors' bit in the questionable error status register is set.

Table 16. Application Hardware Device Specific Errors

Error Message	Description
+520 DUT IP address must be on same subnet as instrument	IP addresses of the DUT and the test set are on different subnets. This may be caused by incorrect IP addresses or the subnet mask may be incorrect.
+521 DUT IP address cannot be the same as instrument LAN address	The DUT and the instrument have the same IP address.
+522 Operation rejected due to invalid IP address	Indicates that and attempt was made to start a ping session before a valid IP address is entered for the device to be pinged.

Related Topics

"Standard Event Status Register" on page 333

+600 to +699 Instrument Device-Specific Error

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.
+603 Measurement failure; Spectrum Monitor hardware is not responding	Indicates that there is a problem with the hardware associated with the spectrum monitor measurement.

Related Topics

"Standard Event Status Register" on page 333

+700 to +799 Application Measurement Device-Specific Error

These errors are generated when a problem occurs that is specific to one of the test set's measurements (such as BERR, or TX power). These are application specific.

When one of these errors is generated, the '+700 errors' bit in the questionable error status register is set. Refer to "Standard Event Status Register" on page 333 for information on this register.

Error Message	Description
+701 GSM measurement failure; TX power hardware is not responding +701 GPRS measurement failure; TX power hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+702 GSM measurement failure; Power vs time hardware is not responding +702 GPRS measurement failure; Power vs time hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+703 GSM measurement failure; Phase frequency error hardware is not responding +703 GPRS measurement failure; Phase frequency error hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+704 GSM measurement failure; Output RF spectrum hardware is not responding +704 GPRS measurement failure; Output RF spectrum hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+705 GSM measurement failure; Fast bit error hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+706 GSM measurement failure; Bit error hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+707 GSM measurement failure; Decoded audio hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+708 GSM measurement failure; IQ tuning hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+709 GSM measurement failure; Dynamic power hardware is not responding	This indicates a problem with your test set's hardware. Please call your local Agilent Service Center.
+729 GSM measurement warning; Dynamic Power measurement has been closed	Indicates that a measurement has been inactivated because of a resource conflict.

+800 to +899 Core Measurement Device-Specific Error

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.

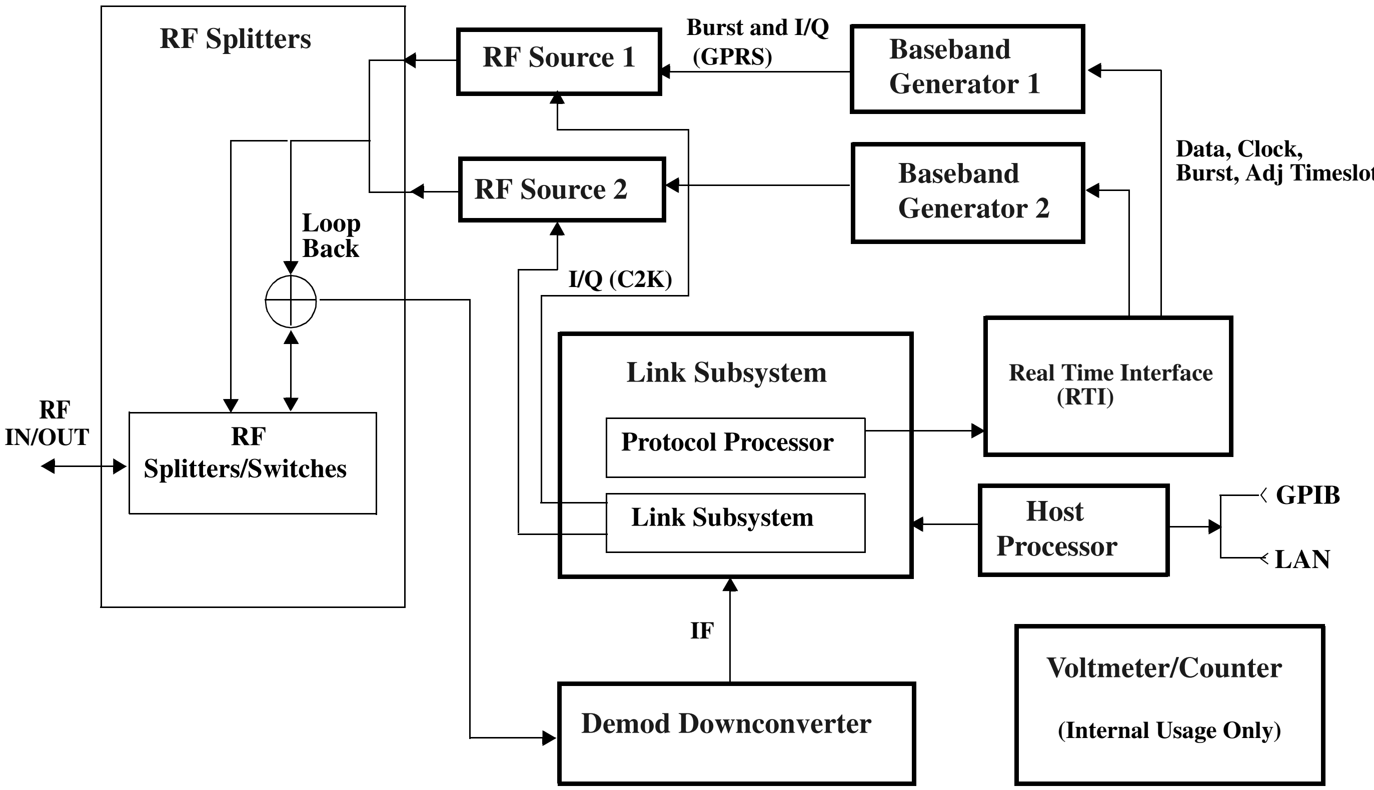
Error Message	Description
+801 Measurement failure; Analog audio hardware is not responding	Indicates that a problem occurs when attempting to control the measurement's hardware.
+802 Measurement failure; Audio analyzer hardware is not responding	Indicates that a problem occurs when attempting to control the measurement's hardware.

Related Topics

"Standard Event Status Register" on page 333

Block Diagram

Description



RF Splitters Module

Input and output signals are routed through the RF Splitters module. The RF Splitters module consists of hybrid power splitters which create three internal ports: one receiver port and two source ports.

The RF Splitters module provides the RF Source path connection to the In/Out port of the instrument. There is about 24 dB of isolation between the source paths and the receiver path. The RF Splitters module has nominally 22 dB of insertion loss in the source path to the RF In/Out port.

Demodulation Downconverter Module

The test set’s downconversion receiver section has one Demodulation Downconverter module. It is used as part of the demodulation receiver that maintains the radio link.

Link Subsystem

The Link Subsystem maintains the radio link for the receive portion of the GPRS format and all CDMA formats. The Link Subsystem has two parts:

- Protocol Processor
- Link Subsystem

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.

The Link Subsystem 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 for CDMA format.

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 modules

Voltmeter/Counter

The voltmeter is only used to measure internal voltages for instrument self-diagnostics and internal RF Source I/Q calibration.

RF Sources

The test set has two identical RF sources. Each RF source consists of a Synthesized Signal Generator module followed by a Vector Output module and an RF Attenuator module. Each Vector Output module contains an I/Q modulator and a Burst modulator. For the GPRS format, Baseband I/Q and Burst modulation signals are supplied to the Vector Output modules by Baseband Generator modules. The Real Time Interface (RTI) provides the interface between the Protocol Processor and both Baseband Generators. Baseband I/Q signals are supplied directly by the Link Subsystem for the CDMA format.

In general, the RF sources are used to test mobile stations encompassing a variety of cellular radio formats. The sources have a frequency range of 292 MHz to 2.7 GHz and an amplitude range of -10 dBm to -127 dBm.

Baseband Generators

The purpose of the Baseband Generator modules is to create the analog baseband I/Q and burst modulation signals for the Vector Output modules for the GPRS format. Specially, the Baseband Generators have the following functions:

- Transform data and clock signals from the Protocol Processor module (via the Real Time Interface module) into baseband analog GPRS I/Q modulation signals (0.3 GMSK) for the I/Q modulators in the Vector Output modules.
- Transform burst and adjacent timeslot signals from the Protocol Processor module (via the Real Time Interface module) into baseband burst modulation signals for the burst modulators in the Vector Output modules.

GPRS Data Connection Troubleshooting

Problems Getting the Mobile to Perform a GPRS Attach

If you have problems getting the mobile to perform a GPRS Attach, try working through some or all of the following troubleshooting hints:

- Ensure that a GSM Test SIM card, or a standard GSM SIM card is installed correctly and is working properly.
- Some mobiles may not perform a GPRS attach automatically. You may have to instruct the mobile to go into a data mode. The method for doing this varies from one mobile to another. For example, you may have to press a key on the mobile's keypad, or make a selection from the mobile's on-screen menu system.
- Ensure that any cable loss or gain between the test set's RF IN/OUT front panel connector and the mobile's RF connector is correctly specified in the RF IN/OUT Amplitude Offset table (see “Amplitude Offset” on page 433 or “How Do I Configure the Test Set for My Test System?” on page 55).
- Check that the cell power is set to a level that is sufficient to overcome any interference (for example, -35 dBm), especially if an indirect RF connection is being used between the test set and the mobile (see “CALL:POWer” on page 245).
- Try using coding scheme CS-1 which has the highest degree of error correction (see “CALL:PDTCH:CSCHeme” on page 228). To set the coding scheme manually, press the **More** key to access the `Call Parms` menu `(2 of 3)`, then press the `Coding Scheme` (**F11**) key.
- Ensure that you have selected a multislot configuration that your GPRS mobile supports (see “CALL:PDTCH:MSLot:CONFiguration” on page 232). Try starting with a multislot configuration of 1 down, 1 up (D1U1) because all GPRS mobiles support this configuration. Initially, you should avoid using a multislot configuration with two uplinks because fewer mobiles support more than one uplink. To set the multislot configuration manually, press the **More** key to access the `Call Parms` menu `(3 of 3)`, then press the `Multislot Config` (**F7**) key.
- Verify that your mobile supports the test set’s default frame numbering scheme (starting position) setting. The default is RELative which your mobile may not support. Try the ABSolute or IMMediate settings (see “CALL:FUNCtion:DATA:FRAMe:STARt” on page 208). To set the frame numbering scheme manually, press the **More** key to access the `Control` menu `(2 of 2)`, press `Protocol Control` (**F4**), `RLC/MAC` (**F1**), then press the `Frame Start Pos` (**F5**) key.

Problems Establishing a BLER Data Connection

If you have problems establishing a data connection using the BLER Data Connection Type specifically, you may want to change the setting of the LLC Frame Check Sequence (see “CALL:FUNCtion:DATA:BLER:LLC:FCSequence” on page 206) or the BLER Block Polling Interval (see “CALL:FUNCtion:DATA:BLER:POLLing:INTerval” on page 206).

For example, if your mobile is not capable of a high level of GMM_INFORMATION messaging (the type of messaging used to stimulate the mobile to send ACK/NACK responses to the test set), then the data connection will timeout. One possible solution to this is to set the LLC Frame Check Sequence to CORRupt preventing the messaging while still forcing the mobile to send ACK/NACK responses. The BLER Block Polling Interval is the rate at which the RLC/MAC blocks have the MAC header poll bit set, forcing a response

(Packet Downlink ACK/NACK) from the mobile.

To change the LLC Frame Check Sequence or BLER Block Polling Interval settings manually, press the **More** key to access the `Control` menu (`2 of 2`), then press the `Protocol Control` (**F4**) key. `Block Poll Rate` is available under the RLC/MAC (**F1**) key and `BLER FCS` is available under the LLC (**F2**) key. Select a parameter and change its setting.

Problems with Measurements in ETSI Test Mode A or B

In order to perform measurements in Active Cell operating mode with the Data Connection Type set to ETSI Type A or ETSI Type B test modes, your mobile must fully support these connection types as defined in the standards. ETSI Type B is required if you want to perform BER measurements in active cell mode.

You can specify the first downlink burst to be looped back in the first uplink burst using the command "CALL:PDTCH:MSLot[:FIRSt]:DOWNlink:LOOPback[:BURSt]" on page 233.

In ETSI Type B test mode, the BLER measurement is performed using a different method from that used when the test set's data connection type is set to BLER. For more details on the BLER measurement see "Block Error Rate (BLER) Reports Description" on page 95.

Protocol Logging and Data Channel Troubleshooting

Protocol Logging

- Error message appears when I select Start Protocol Logging on the test set: The test set must be connected via a LAN or WAN to a PC running the E6581A Wireless Protocol Advisor software. Check connections, installation of software, IP addresses and gateway addresses.

Data Channel

- If your data channel application does not seem to be working, try pinging the device. The test set has a ping feature, and so do most computer operating systems. See “Ping” on page 28 for more information.
- Ping log has an unknown IP address: If you log a Ping that originated from the test set, the Ping Downlink Source Address and the Uplink Destination Address have a fixed value of 0x821DB5CB. This is because the test set uses an internal address to originate IP data from the test set to the DUT. See “Protocol Logging During Ping” on page 30 for more information.
- Ping does not work although DUT is attached: The device must be PDP activated. This may require that you initiate a data transfer from the DUT. Also, Ping and Data Channel are only available in IP Data mode.
- Can't find where to set the DUT address: Switch the `Data Conn Type` to `IP Data` mode first.
- What is the APN (Access Point Name) that I need to include with the dial string when using dial-up? No APN is needed.

Related Topics

“Protocol Logging” on page 23

“Data Channel” on page 27

6 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,E6900A,
                    !US00000123,0".
```

- Agilent Technologies is the manufacturer.
- Printable ASCII characters excluding comma and semicolon up to a 25-character string.

  Model number example: E6900A
- 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

"*IDN?" on page 336

"CALibration:DATE" on page 344

"SYSTem:CURRent:TA" on page 365

"SYSTem:COMMunicate" on page 355

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:

Agilent Technologies E6900A Test Set

Serial Number: US40480007

Current Test Application: E6910A, GPRS Protocol App, A.01.01

Instrument Options Installed: 002 RF Source 2, 003 Flexible Radio Link

HOST BOOT ROM REV: A.02.04_BOOT
PROTOCOL BOOT ROM REV: A.05.35
DSP BOOT ROM REV:

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
```

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” on page 358

“SYSTem:CURRent:TA” on page 365

“SYSTem:APPLication” on page 349

“Obtaining Identification Information *IDN?” on page 420

“Rear Panel Connectors” on page 60

GPRS Protocol Application Revision Information

This document describes the original features and functionality of the E6910A GPRS Protocol Application.

Applicable Standards

Multiple standards apply to this protocol application. The most relevant are listed here:

- GPRS 04.60 v. 7.3.1
- GSM 04.08 v. 7.6.1
- GSM 04.64 v. 7.3.0

A.01 Initial Release June 2002

These are the original features of the E6910A.

Signaling Test

- Protocol Logging:
  Log GPRS protocol messages using the GPRS Wireless Protocol Advisor software (included with the protocol application). Allows real-time logging of inter-layer and peer-to-peer messages. Includes powerful triggering, filtering, and search capabilities of logs, and decode view for viewing individual bit fields with appropriate labeling for each message.
- Data Channel:
  Data Channel allows the test set to be used as a router for transferring IP datagrams between the DUT and anywhere on the network that the test set is connected to. Provides real-time, true to life GPRS data transfer. Allows Internet connectivity through to the wireless device. Tests WAP, web browsing, FTP throughput with local or remote servers, serial or USB modem functionality of the appliance. Includes the ability to set an IP address for the DUT, ping the DUT or any alternate address, control ping setup, and log protocol while using the data channel.
- Short Message Service (SMS):
  Short messages can be sent to and from the DUT. This allows emulation of live GPRS point-to-point SMS (a short message is sent from one MS to another MS via the network), as well as cell broadcast SMS functionality. The cell broadcast SMS service allows short messages to be sent to every MS currently in a particular cell. Cell broadcast messages are repeated at intervals over a period of time, which allows an MS to receive the message even if entering the cell after the first transmission.
- Protocol Event Trigger Output:
  This feature provides a hardware trigger output from the rear panel of the test set to control external instruments and devices. Various frame triggers and protocol message-based triggers are available, based on the downlink in multiple layers of the protocol stack.
- Mobile Station Measurement Reports:
  Measurement Reports display measurements from the DUT regarding the quality of the downlink channel. The following channel parameters have data provided:
- USF BLER:
  USF BLER is a measurement report viewed on the Call Setup screen. It is an indication of the number of

PDTCH blocks incorrectly decoded (USF bits only) by the MS receive path.

- GPRS Infrequent Network Events - accept/reject options for key requests:
  - — Attach Accept
  - — Attach Reject (with cause)
  - — Detach Request (Mobile Terminated)
  - — Identity Request
  - — Activate PDP Context Accept
  - — Activate PDP Context Reject
- LLC frame check sequence valid or corrupt

Call Processing

- Operating modes: active cell and instrument test modes (BCH only, BCH + PDTCH).
  Data connection types: ETSI A, ETSI B, BLER and IP Data.
- Base Station Emulation:
  - — GSM 450, GSM 480, GSM 750, GSM 850, GSM 900 (includes PGSM/EGSM), DCS 1800, PCS 1900, and RGSM frequency bands
  - — Inter-cell handovers between all bands
  - — Mobile initiated attach/detach, cell-initiated detach
  - — Coding schemes: CS-1, CS-2, CS-3, CS-4
  - — Multislot configurations: 1x1, 2x1, 3x1, 4x1, 2x2, 3x2 (downlink x uplink)
  - — Payload data pattern user selectable in data connection types ETSI B and BLER - all 1s, all 0s, alternate bits, alternate pairs, alternate quads, PRBS 15, fixed 2B
  - — Power in unused timeslots
  - — Packet data transfers on uplink and downlink
  - — User-selectable PBCCH or BCCH, broadcast channel configuration used by the base station to communicate signaling information to the mobile.
  - — Several cell parameters can be controlled:
    - — MCC
    - — MNC
    - — LAC
    - — NCC
    - — BCC
    - — RAC
  - — BA table with user-settable neighbor cell
- Fixed Allocation:

Fixed allocation provides more control over transferring data between the test set and the DUT. It provides the DUT with an allocation of uplink blocks which satisfies the number of octets that the DUT believes is necessary to transfer all of its data.

- Timing Advance:
  Timing advance values can be sent to the DUT as part of an Immediate Assignment message, enabling simulation of propagation delays by telling the DUT how much it should offset its transmissions. Actual value is band-dependent.
- Continuous Timing Advance:
  Continuous Timing Advance is an alternate method to the Timing Advance assignment method. This is available in the RLC/MAC layer of the Protocol Control Menu. The timing advance values are sent in downlink data to the DUT.
- Uplink State Flag:
  The USF value is sent to the DUT as part of an Immediate Assignment message. The DUT can be instructed to transmit on the block corresponding to the new USF.

Other

- Ability to set up all PDTCH parameters but defer their implementation until handover command is sent
- Selection of which contiguous downlink bursts to loop back on the uplink
- Packet timeslot reconfigure off/on
- Packet power timing advance off/on

Display Brightness

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:BRIGhtness" on page 346

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 the program executes. 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.
```

Related Topics

“DISPlay:MODE” on page 347

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 354

“Error Messages” on page 379

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” on page 370

“Rear Panel Connectors” on page 60

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.

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:LAN[:SELF]:ADDRess" on page 356

"SYSTem:COMMunicate:LAN[:SELF]:DGATeway" on page 357

"SYSTem:COMMunicate:LAN[:SELF]:SMASk" on page 357

Configuring the Test Set’s GPIB Address

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 355

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.

GPIB 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.

GPIB 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

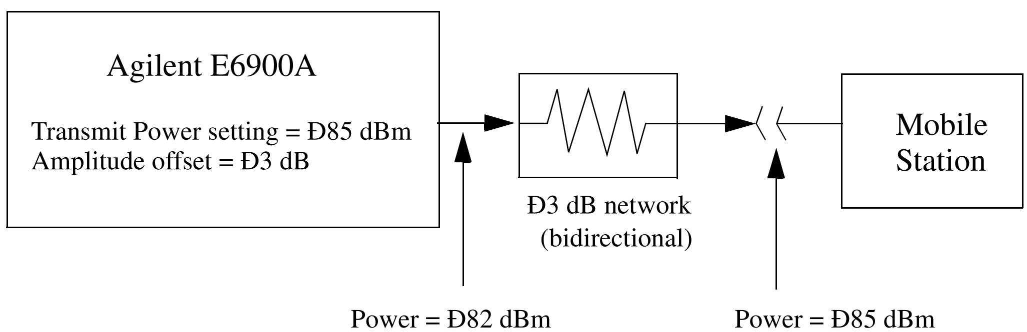
When the amplitude offset table entries accurately represent the loss in all components (cabling, connectors, and test fixturing) in the signal path between the test set and the mobile station, the test set will make the necessary adjustments in both the receiver and transmitter.

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 7. Amplitude Offset Mobile Station Receiver Example

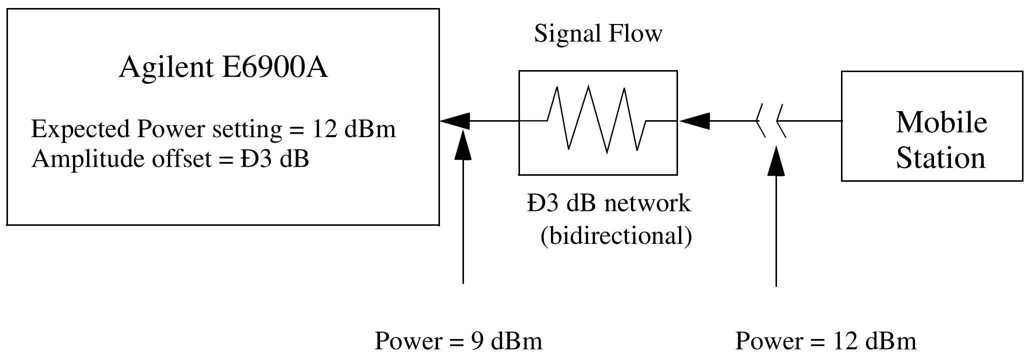


Mobile Station Transmitter Example

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.

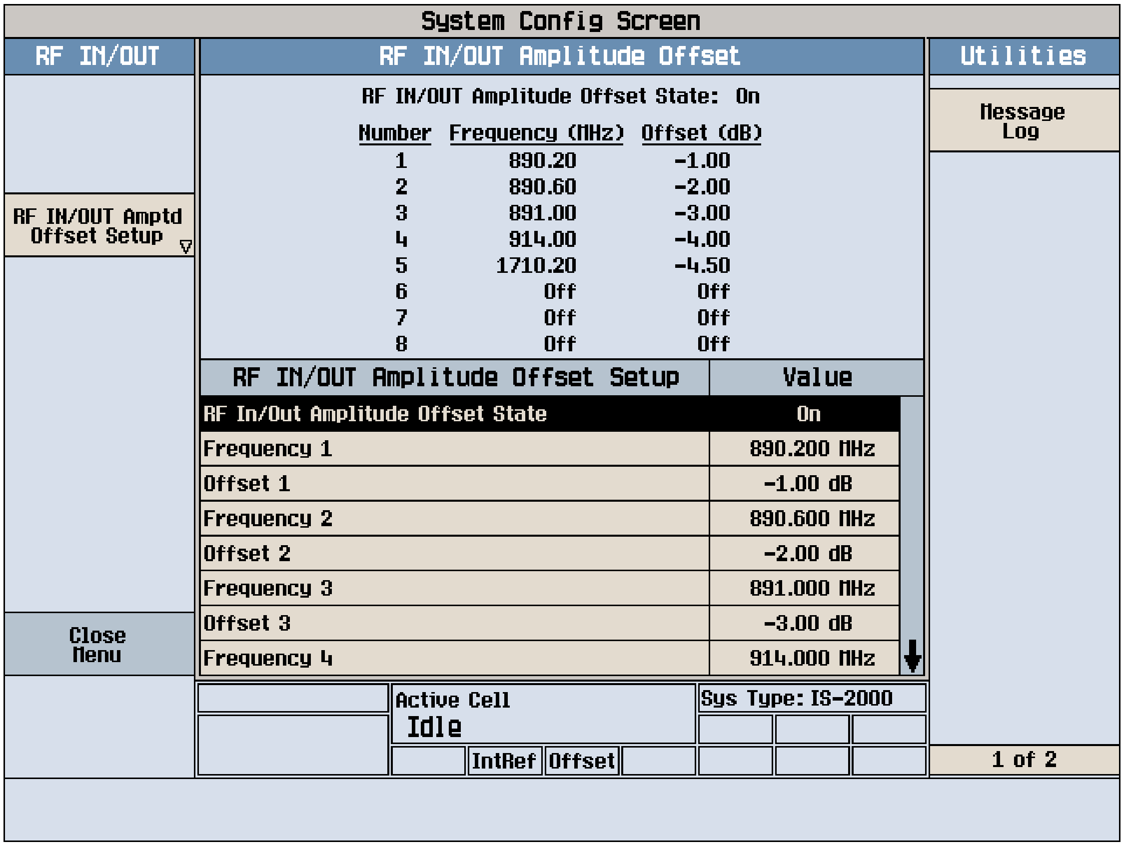
Figure 8. Amplitude Offset Mobile Station Transmitter Example



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.

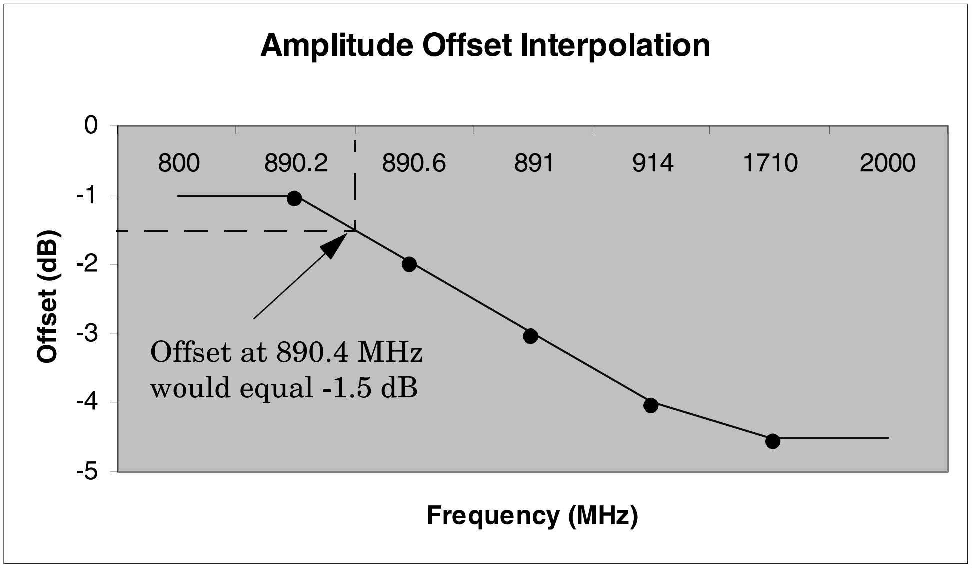
Figure 9. RF IN/OUT Amplitude Offset Setup



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 10. 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 9. "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 10. 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" on page 359

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"

Protocol Application Revisions and Licenses

Description

Different revisions of the protocol applications in your test set provide different capabilities. The selected protocol application revision is loaded after 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 protocol application.

Protocol Application Revision Queries and Commands

These are commands to query revision information or select a revision.

- To query a **selected** protocol application revision (running or not) use this GPIB command:

  `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION? 'GPRS PROTOCOL APP'"`

- To query the revision of the protocol application **currently running** use this GPIB command:

  `OUTPUT 714;"SYSTEM:APPLICATION:CURRENT:REVISION?"`

- To query **all** of the revisions available for a protocol application use this GPIB command:

  `OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION? 'GPRS PROTOCOL APP'"`

- To **select** a revision of a protocol application use this GPIB command:

  `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:REVISION 'GPRS PROTOCOL APP','A.01.20'"`

- To query the number of revisions for a specified protocol application:

  `OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:REVISION:COUNT? 'GPRS PROTOCOL APP'"`

Protocol Application License Status Query

The protocol application license status can be queried for a particular protocol application and revision using the following GPIB query:

`OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:LICENSE? 'GPRS PROTOCOL APP','A.01.20'"`

This query returns one of the following:

- "LIC" - This revision of protocol application appears to have a LICense. The protocol application may have been developed before licensing and therefore needs no license.
- "NLIC" - This protocol application does not appear to have a license. Selecting a Not LICensed revision will result in an error +130.
- "PART" - Some PART of the protocol application does not appear to have a license.
- "UNKN" - This protocol 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 Application Setup menu to determine the licensed versions of protocol applications available.

Revision and license information can be viewed and selected from the SYSTEM CONFIG screen, by selecting the 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 protocol application appears to have a License. The protocol application may have been developed before licensing and therefore needs no license.
- “N” - This protocol application does not appear to have a license. Selecting a Not licensed revision will result in an error +130.
- “P” - Some Part of the protocol application does not appear to have a license.
- “U” - This protocol application has Unknown license status.

Related Topics

“SYSTem:APPLication” on page 349

Protocol Application Name

Description

The following queries give you details about the protocol application name. To query protocol applications you must use the protocol application name as it appears in the catalog (without regard to case).

- To query the name of the all protocol applications installed in the test set use this GPIB query.

  `OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME?"`

- To query the name of the selected protocol application (running or not) use this GPIB query.

  `OUTPUT 714;"SYSTEM:APPLICATION:SELECT:NAME?"`

- To query the name of the currently running protocol application use this GPIB query.

  `OUTPUT 714;"SYSTEM:APPLICATION:CURRENT:NAME?"`

- To query the number of protocol applications installed in the test set use this GPIB query.

  `OUTPUT 714;"SYSTEM:APPLICATION:CATALOG:NAME:COUNT?"`

The protocol application names can also be displayed in the Application Setup menu on the test set's display.

Related Topics

"SYSTem:APPLication" on page 349

Index