SCPI Command Reference, Volume 2

Agilent Technologies
ESG Vector Signal Generator

This guide applies to signal generator models and associated serial number prefixes listed below. Depending on your firmware revision, signal generator operation may vary from descriptions in this guide.

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SCPI Command Reference, Volume 2

Dual ARB Subsystem–Option 001 or 002 ([:SOURce]:RADio:ARB)

:CLIPping

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:CLIPping "<file name>",IJQ|IORQ,<val>[,<val>]
```

This command sets the clipping level of the selected waveform segment to a percentage of its highest peak.

The variable <val> is expressed in units of percent.

IJQ This choice clips the composite I/Q waveform.

IORQ This choice clips I and Q separately. When this choice is enabled, percentage values for both I and Q must be specified.

***RST** IJQ <*val*>: +100

Range <*val*>: 10–100 (0.1% resolution)

Choices "<file name>" IJQ IORQ

Key Entry **Clipping Type |I+jQ| |I|,|Q|**

Remarks A value of 100 percent equates to no clipping.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:CLOCk:SRATe

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:CLOCk:SRATe <val>
[:SOURce]:RADio:ARB:CLOCk:SRATe?
```

This command adjusts the sample clock rate.

The variable <val> is expressed in units of Hertz (Hz–MHz).

***RST** +1.00000000E+008

Range 1–1E8

Key Entry **ARB Sample Clock**

Remarks N/A

:GENerate:SINE

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:GENerate:SINE ["<file name>"][,<osr>],[<scale>],
[I|Q|IQ]
```

This command creates a file (using a specific file name) and stores a generated sine wave.

<osr> This variable sets the oversample ratio, which must be a value that is ≥ 4. If the specified over sample ratio is < 60 (the minimum number of samples), multiple periods are generated to create a waveform with at least 60 samples. The number of periods that will be created is 60 ÷ <osr> (quotient will round off to a whole number). A waveform with an oversample ratio ≥ 60 has one period.

The maximum value for the range below is determined by the option and available baseband memory.

***RST** N/A

Choices I Q IQ

Range *<osr> Option 001*: 4–8Msamples

Option 002: 4–32Msamples

Key Entry N/A

Remarks Executing this command without the "<file name>" variable will generate a factory default `SINE_TEST_WFM` file.

When using the variable "<file name>" for this command, the “@” or “:” character is not allowed.

The file is always generated as "WFM#: <file name>", where “#” is replaced by the baseband generator number.

:MARKer:CLEar

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:MARKer:CLEar "<file name>",<mkr_num>,<first_Point>,
<last_point>
```

This command clears markers from a waveform segment.

"<file name>" This variable specifies the name of the waveform segment file.

<mkr_num> This variable designates which marker is to be cleared (1 or 2).

<first_point> This variable defines the first point in a range of points (must be ≥ 1, and ≤ the total number of waveform points).

<last_point> This variable defines the last point in a range of points (must be ≥ 1, and ≤ the total number of waveform points).

***RST** N/A

Range <*first_Point*>: 1–# of waveform points

<*last_point*>: 1–# of waveform points

Choices <*mkr_num*>: 1 2

Key Entry **Marker 1 2** **First Mkr Point** **Last Mkr Point**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MARKer:CLEar:ALL

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:MARKer:CLEar:ALL "<file name>",<mkr_num>
```

This command clears all markers from a waveform segment simultaneously.

"<file name>" This variable specifies the name of the waveform segment file.

<mkr_num> This variable designates which marker is to be cleared (1 or 2).

***RST** N/A

Range N/A

Choices <*mkr_num*>: 1 2

Key Entry **Set Marker Off All Points**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MARKer:POLarity

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:MARKer:POLarity NEG|POS
[:SOURce]:RADio:ARB:MARKer:POLarity?
```

This command sets the polarity for both marker 1 and marker 2.

***RST** POS

Choices NEG POS

Key Entry **Marker Polarity Neg Pos**

Remarks N/A

:MARKer:RFBLank

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:MARKer:RFBLank ON|OFF|1|0
[:SOURce]:RADio:ARB:MARKer:RFBLank?
```

This command enables or disables RF blanking when marker 2 is low.

***RST** 0

Choices ON OFF 1 0

Key Entry **Mkr 2 RF Blank Off On**

Remarks Marker 2 represents the output on the EVENT 2 BNC connector.

:MARKer:ROTate

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:MARKer:ROTate "<file name>",<rotate_count>
```

This command shifts the marker bits in a waveform segment.

***RST** N/A

Range <*rotate_count*>: number of points in the waveform – 1

Key Entry N/A

Remarks To define the maximum allowable points in a waveform, refer to ":MARKer:[SET]" on page 446.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MARKer:[SET]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:MARKer:[SET] "<file name>",<mkr_num>,<first_point>,
<last_point>,<skip_count>
```

This command defines a marker over a range of points on a waveform segment.

"<file name>" This choice specifies the name of the waveform segment file.

<mkr_num> This variable designates which marker is to be cleared (1 or 2).

<first_point> This variable defines the first point in the range over which the marker will be placed. This number must greater than or equal to 1, and less than or equal to the total number of waveform points.

If you enter a value for either the first marker point or the last marker point that would make the first marker point occur after the last, the last marker point is automatically adjusted to match the first marker point.

<last_point> This variable defines the last point in the range over which the marker will be placed. This value must be greater than or equal to 1, and less than or equal to the total number of waveform points.

<skip_count> This variable creates a repeating pattern of markers.

Defining a skip count causes the marker to appear on the first point in the defined range, disappear over the number of points defined as the skip count, then reappear for one point. The pattern repeats until the end of the defined range. This enables you to set repetitively spaced markers. For example, a skip of 2 produces two points between each marker across the defined range.

***RST** N/A

Range <*first_Point*>: 1–# of waveform points

<*last_point*>: 1–# of waveform points <*skip_count*>: 0–65535

Choices <*mkr_num*>: 1 2

Key Entry **Marker 1 2** **First Mkr Point** **Last Mkr Point** **# Skipped Points**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:REFerence:EXTernal:FREQuency

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:REFerence:EXTernal:FREQuency <val>
[:SOURce]:RADio:ARB:REFerence:EXTernal:FREQuency?
```

This command allows you to enter the frequency of the applied external reference.

The variable <val> is expressed in units of Hertz (Hz–MHz).

***RST** +1.00000000E+007

Range 2.5E5–1E8

Key Entry **Reference Freq**

Remarks The value specified by this command is effective only when you are using an external ARB reference applied to the BASEBAND GEN REF IN rear panel connector.

To specify external as the ARB reference source type, refer to ":REFerence[:SOURce]" on page 447.

:REFerence[:SOURce]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:REFerence[:SOURce] INTernal|EXTernal
[:SOURce]:RADio:ARB:REFerence[:SOURce]?
```

This command selects either an internal or external reference for the waveform clock.

***RST** INT

Choices INTernal EXTernal

Key Entry **ARB Reference Ext Int**

Remarks If the EXTernal choice is selected, the external frequency value *must* be entered and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":REFerence:EXTernal:FREQuency" on page 447 to enter the external reference frequency.

:RETRigger

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:RETRigger ON|OFF|IMMediate
[:SOURce]:RADio:ARB:RETRigger?
```

This command enables or disables the ARB retriggering mode; the retrigger mode controls how the retriggering function performs while a waveform is playing.

ON (1) This choice specifies that if a trigger occurs while a waveform is playing, the waveform will retrigger at the end of the current waveform sequence and play once more.

OFF (0) This choice specifies that if a trigger occurs while a waveform is playing, the trigger will be ignored.

IMMediate This choice specifies that if a trigger occurs while a waveform is playing, the waveform will reset and replay from the start immediately upon receiving a trigger.

***RST** ON

Choices ON OFF IMMediate

Key Entry **On** **Off** **Immediate**

Remarks N/A

:SCALing

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:SCALing "<file name>",<val>
```

This command sets the scaling value of the selected waveform segment.

The variable <val> is expressed in units of percent.

***RST** N/A

Range <*val*>: 1–100

Key Entry **Scaling**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SEQuence

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:SEQuence "<file name>","<waveform>",<reps>,
<mkr1(1|0)>,<mkr2(1|0)>,{"<waveform>",<reps>,<mkr1(1|0)>,<mkr2(1|0)>}
[:SOURce]:RADio:ARB:SEQuence? "<file name>"
```

This command creates or defines a waveform sequence. The waveform file consists of the subsequent waveform segment files (combined in the same order in which the variables listed above).

"<file name>"	This variable specifies the name of the waveform sequence file.
"<waveform>"	This variable specifies the exact name of the waveform file.
<reps>	This variable edits the number times the waveform should repeat.
<mkr1(1|0)>	This variable toggles marker 1 on (1) or off (0).
<mk2(1|0)>	This variable toggles marker 2 on (1) or off (0).

***RST** N/A

Range <reps>: 1–65535

Key Entry **Build New Waveform Sequence** **Edit Selected Waveform Sequence** **Toggle Marker 1** **Toggle Marker 2** **Edit Repetitions**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax. compilations.

:RSCAling

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:RSCaling <val>
[:SOURce]:RADio:ARB:RSCaling?
```

This command adjusts the scaling value that is applied to a waveform while it is playing.

The variable <val> is expressed in units of percent.

***RST** +7.00000000E+001

Range 1–100

Key Entry **Waveform Runtime Scaling**

Remarks Runtime scaling does not alter the waveform data file.

:TRIGger:TYPE

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger:TYPE CONTinuous|SINGle|GATE|SADVance
[:SOURce]:RADio:ARB:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The waveform repeats continuously; the sequence restarts every time the previous playback is completed.
SINGle	The waveform segment or sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set high or low.
SADVance	The selected trigger controls the advance to the next segment in the sequence. To customize segment advance, refer to ":TRIGger:TYPE:SADVance[:TYPE]" on page 451.

***RST** CONT

Choices CONTinuous SINGle GATE SADVance

Key Entry **Continuous** **Single** **Gate** **Segment Advance**

Remarks The SADvance choice can only be activated when a waveform sequence is active.

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:ARB:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE	This choice immediately transmits a waveform that is continuously repeated.
TRIGger	This choice causes the waveform to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated waveform begins.
RESet	This choice immediately restarts a continuously repeated waveform upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 450.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:ARB:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select GATE as the trigger type, refer to ":TRIGger:TYPE" on page 450.

:TRIGger:TYPE:SADVance[:TYPE]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE] SINGle|CONTinuous
[:SOURce]:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE]?
```

This command customizes the segment advance trigger type setting.

SINGle This choice will play the next segment in the sequence only once.

CONTinuous This choice will instruct the sequencer to continually play the next segments in the waveform sequence in a continuous pattern.

***RST** CONT

Choices SINGle CONTinuous

Key Entry **Single** **Continuous**

Remarks This command is valid when SADVance has been selected as the trigger type.

To select SADVance as the trigger type, refer to ":TRIGger:TYPE" on page 450.

:TRIGger[:SOURce]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:ARB:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 452.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** EXT

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|EPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 452.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[SOURce]:EXTernal:DELay

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the value for the external trigger delay.

The variable <val> is expressed as seconds (µsec–sec).

***RST** +1.00000000E–003

Range 1E–8 to 4E1

Key Entry **Ext Delay Time**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 452.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 452.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity of the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 452.

:WAVeform

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB:WAVeform "WFM1|SEQ:<file_name>"
[:SOURce]:RADio:ARB:WAVeform?
```

This command selects the type of signal for the dual arbitrary waveform generator to generate.

WFM1	This choice selects a single waveform segment.
SEQ:<file_name>	This choice selects a sequence of segments. The appropriate file name of the sequence replaces the `<file name>` variable.

***RST** N/A

Choices WFM1 SEQ:<file_name>

Key Entry **Select Waveform**

Remarks N/A

[:STATe]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:ARB[:STATe] ON|OFF|1|0
[:SOURce]:RADio:ARB[:STATe]?
```

This command enables or disables the arbitrary waveform generator function.

***RST** 0

Choices ON OFF 1 0

Key Entry **ARB Off On**

Remarks N/A

EDGE Subsystem–Option 402 ([:SOURce]:RADio:EDGE)

:ALPHa

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:ALPHa <val>
[:SOURce]:RADio:EDGE:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 467.

:BBCLock

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:EDGE:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Choices INT EXT

Key Entry **Ext Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when

external mode is used.

This will be ignored if the external reference is set to EXTernal. To change the external reference type, refer to ":EREFerence" on page 466.

:BBT

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BBT <val>
[:SOURce]:RADio:EDGE:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +3.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 467.

:BURSt:SHAPe:FALL:DELay

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:DELay?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –16.2000 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal

generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 458 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FDELay

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FDELay?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –16.2000 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 457 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FALL:TIME

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:TIME?
```

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.2000–409.2000

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 459 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FTIMe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FTIMe?
```

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range 0.2000–409.2000

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and

maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 458 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RDELay

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RDELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –7.2000 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 460 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:DELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend

upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –7.2000 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 460 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:TIME?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.2000–16.4000

Key Entry **Rise Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 462 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RTIMe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RTIMe?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.2000–16.4000

Key Entry **Rise Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470. Refer to ":SRATe" on page 483 for a list of minimum and

maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 461 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:EDGE:BURSt:SHAPe[:TYPE]?
```

This command sets the burst shape type.

SINE This choice selects a burst shape defined by the burst rise and fall *RST values.

"<file name>" This choice selects a user-defined file from signal generator memory.

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:BURSt[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:EDGE:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Choices ON OFF 1 0

Key Entry **Data Format Pattern Framed**

Remarks N/A

:CHANnel

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:CHANnel EVM|ACP
[:SOURce]:RADio:EDGE:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** ACP

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 467.

:DATA

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|
P4|P8|P16|P32|P64
[:SOURce]:RADio:EDGE:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DATA:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:DATA:FIX4 <val>
[:SOURce]:RADio:EDGE:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the EDGE modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

To change the data type, refer to ":DATA" on page 464.

:DEFault

Supported All with Option 402

`[:SOURce]:RADio:EDGE:DEFault`

This command returns all of the EDGE modulation format parameters to factory settings. It does not affect any other signal generator parameters.

***RST** N/A

Range N/A

Key Entry **Restore EDGE Factory Default**

Remarks N/A

:EDATa:DELay

Supported All with Option 402

`[:SOURce]:RADio:EDGE:EDATa:DELay?`

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** +0.00000000E+000

Range N/A

Key Entry N/A

Remarks When the EDGE format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported All with Option 402

`[:SOURce]:RADio:EDGE:EDCLock SYMBol|NORMal`
`[:SOURce]:RADio:EDGE:EDCLock?`

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or

continuous) symbol sync signal.

***RST** NORM

Choices SYMBol NORMal

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 456 to select EXT as the data clock type.

:EREFerence

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:EREFerence INT|EXT
[:SOURce]:RADio:EDGE:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Choices INT EXT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 466 to enter the external reference frequency setting.

:EREFerence:VALue

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:EREFerence:VALue <val>
[:SOURce]:RADio:EDGE:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 466 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|IS95|
IS95_EQ|IS95_MOD|IS95_MOD_EQ|EDGE|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:EDGE:FILTer?
```

This command selects the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
EDGE	This choice selects Laurant's decomposition of a Gaussian filter with a 0.300 fixed BbT.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<User FIR>" This variable is any filter file that you have stored into memory.

***RST** EDGE

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_MOD IS95_EQ IS95_MOD_EQ EDGE AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **EDGE** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:IQ:SCALe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:IQ:SCALe <val>
[:SOURce]:RADio:EDGE:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +113

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:EDGE:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 470.

Refer to ":SRATe" on page 483 for a list of minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:EDGE:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

Remarks N/A

:MODulation:UFSK

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:UFSK "<file name>"
[:SOURce]:RADio:EDGE:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 470 to change the current

modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation:UIQ

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:UIQ "<file name>"
[:SOURce]:RADio:EDGE:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 470 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|GRAYQPSK|
OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|FSK16|C4FM|
QAM4|QAM16|QAM32|QAM64|QAM256|EDGE|UIQ|UFSK
[:SOURce]:RADio:EDGE:MODulation[:TYPE]?
```

This command sets the modulation type for the EDGE personality.

***RST** EDGE

Choices BPSK QPSK IS95QPSK GRAYQPSK OQPSK IS95OQPSK π4DQPSK PSK8 PSK16 D8PSK MSK FSK2 FSK4 FSK8 FSK16 C4FM QAM4 QAM16 QAM32 QAM64 QAM256 EDGE UIQ UFSK

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK**

IS-95 OQPSK **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **256QAM** **EDGE** **User I/Q** **User FSK**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:EDGE:POLarity[:ALL]?
```

This command sets the rotation direction for the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORM INVerted

Key Entry **Phase Polarity Normal Invert**

Remarks N/A

:SECondary:RECall

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current frame.

***RST** N/A

Range N/A

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 472.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 473.

:SECondary:SAVE

Supported All with Option 402

`[:SOURce]:RADio:EDGE:SECondary:SAVE`

This command saves the current frame configuration as the secondary frame with the filename `EDGE_SECONDARY_FRAME`.

***RST** N/A

Range N/A

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to ":SECondary:RECall" on page 471.

:SECondary:TRIGger[:SOURce]

Supported All with Option 402

`[:SOURce]:RADio:EDGE:SECondary:TRIGger[:SOURce] KEY|EXT|BUS`
`[:SOURce]:RADio:EDGE:SECondary:TRIGger[:SOURce]?`

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connection, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 487.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** N/A

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:SECondary[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:EDGE:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Choices ON OFF 1 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 472.

:SLOT0|[1]|2|3|4|5|6|7:CUSTom

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom PN9|PN11|PN15|PN20|
PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for framed data transmission.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 PN16 PN32 P64

Key Entry **PN9 PN15 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

Refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 481

:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4 <val>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

To change the data type, refer to ":SLOT0|[1]|2|3|4|5|6|7:CUSTom" on page 473.

:SLOT0|[1]|2|3|4|5|6|7:CUSTom:GUARd

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:
GUARd <24 or 27 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:GUARd?
```

This command defines the hexadecimal value for the guard time field in the selected custom timeslot.

***RST** *Timeslots 0 & 4*: #H7FFFFFF

Timeslots: 1, 2, 3, 5, 6, &7: #H0FFFFFF

Range *Timeslots 0 & 4*: #H0–#H7FFFFF

Timeslots: 1, 2, 3, 5, 6, &7: #H0–#H0FFFFFF

Key Entry G

Remarks The guard time field is always modulated (but not bursted), even when the timeslot is off.

If the guard time and T2 symbols of the current timeslot and the T1 symbols of the next timeslot do not match, the burst shape may not be smooth (even if the current timeslot is turned off).

To change the current timeslot type, refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 481.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:
ENCRyption PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|
P64|DMCS9|UMCS9|DMCS5|UMCS5|ETCHF43|UNCoded
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption?
```

This command selects the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) and the multiframe channel type for the current normal timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64 DMCS9 UMCS9 DMCS5 UMCS5 ETCHF43 UNCoded

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's Downlink MCS-9 Uplink MCS-9 Downlink MCS-5 Uplink MCS-5 E-TCH/F43.2 Uncoded**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

To change the current timeslot type, refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 481.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS5:DATA

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS5:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS5:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 5 (MCS-5) downlink channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks To select downlink MCS-5 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS9:DATA

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS9:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS9:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 9 (MCS-9) downlink channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks To select downlink MCS-9 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ETCH:F43:DATA

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ETCH:F43:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ETCH:F43:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced, circuit switched, full-rate traffic channel with 43.2 kbits per second of user data (E-TCH/F43.2).

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks To select E-TCH/F43.2 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4 <val>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for framed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the EDGE modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be selected as the data type.

To select FIX4 as the data type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS5:DATA

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS5:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS5:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 5 (MCS-5) uplink channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks To select uplink MCS-5 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS9:DATA

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS9:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS9:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 9 (MCS-9) uplink channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks To select uplink MCS-9 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:UNCoded

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:
UNCoded PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:
UNCoded?
```

This command sets the data type (pseudo-random number sequence) for an uncoded channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks To select uncoded as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 475.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:GUARd

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:
GUARd <24 or 27 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:GUARd?
```

This command sets the hexadecimal value for the guard time field in the selected normal timeslot.

***RST** *Timeslots 0 & 4*: #H7FFFFFF

Timeslots: 1, 2, 3, 5, 6, &7: #H0FFFFFF

Range *Timeslots 0 & 4*: #H0–#H7FFFFFF

Timeslots: 1, 2, 3, 5, 6, &7: #H0–#H0FFFFFF

Key Entry G

Remarks The guard time field is always modulated (but not bursted), even when the timeslot is off.

If the guard time and T2 symbols of the current timeslot and the T1 symbols of the next timeslot do not match, the burst shape may not be smooth (even if the current timeslot is turned off).

To change the current timeslot type, refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 481.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:T1

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T1 <9 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T1?
```

This command sets the hexadecimal value for the leading 9-bit tail field in the selected normal timeslot.

***RST** #H1FF

Range #H0–#H1FF

Key Entry T1

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:T2

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T2 <9 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T2?
```

This command sets the hexadecimal value for the trailing 9-bit tail field in the selected normal timeslot.

***RST** #H1FF

Range #H0–#H1FF

Key Entry **T2**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence TSC0|TSC1|
TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<78 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence?
```

This command sets the 78-bit training sequence code for a normal timeslot to one of eight values or to create a custom value.

***RST** #H3F3F9E49FFF3FF3F9E49

Range *<78 bit_pattern>*: #H0–#H3FFFFFFFFFFFFFFFFFFF

Choices TSC0 (3F3F9E49FFF3FF3F9E49) TSC1 (3F3C9E49E493FF3C9E49)
TSC2 (39FFF24F24F3F9FFF24F) TSC3 (39FF924F279FF9FF924F)
TSC4 (3FE4F3C93F9FFFE4F3C9) TSC5 (39FC93CF27FFF9FC93CF)
TSC6 (0F3F9249E4FFCF3F9249) TSC7 (093C927FE7F3C93C927F)
<78 *bit_pattern*>

Key Entry **TSC0** **TSC1** **TSC2** **TSC3** **TSC4** **TSC5** **TSC6** **TSC7** **Custom TS**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:LCAPacity:POWer

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:POWer MAIN|DELTa
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:STATe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:STATe ON|OFF|1|0
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:STATe?
```

This command enables or disables the operating state of the selected timeslot.

***RST** *Timeslot 0*: 1 *Timeslots 1–7*: 0

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7[:TYPE] CUSTom|NORMal|
NORMAL_ALL
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7[:TYPE]?
```

This command sets the timeslot type.

CUSTom This choice sets a generic, non-standard timeslot configuration for the selected timeslot, which allows for the modulation of the data pattern and guard bit fields.

NORMal This choice sets a normal timeslot configuration for the selected timeslot.

NORMAL_ALL This choice sets all timeslots to a normal timeslot configuration.

***RST** NORM

Choices CUSTom NORMal NORMAL_ALL

Key Entry **Custom** **Normal** **Normal All**

Remarks N/A

:SOUT:

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:EDGE:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks To change the synchronization output offset value, refer to ":SOUT:OFFSet" on page 482.

:SOUT:OFFSet

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SOUT:OFFSet <val>
[:SOURce]:RADio:EDGE:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data

pattern or timeslot.

The variable <val> is expressed in bits.

***RST** +0

Range –155 to 155

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT:" on page 482.

:SOUT:SLOT

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SOUT:SLOT <val>
[:SOURce]:RADio:EDGE:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +0

Range 0–7

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT:" on page 482.

:SRATe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:SRATe <val>
[:SOURce]:RADio:EDGE:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.70833333E+005

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 467, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well

as the actual filter response.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 470.

:TRIGger:TYPE

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:EDGE:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 485.
SINGle	The framed data sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:EDGE:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE	This choice immediately transmits a framed data sequence that is continuously repeated.
TRIGger	This choice causes the framed data sequence to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated framed data sequence begins.

RESet — This choice immediately restarts a continuously repeated framed data sequence upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 485.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:EDGE:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW — The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH — The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select GATE as the ARB trigger type, refer to ":TRIGger:TYPE" on page 485.

:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY — This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT — This choice enables triggering using an externally applied signal at the

PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 487.

BUS — This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** KEY

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|EPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 — This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 — This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 — This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 — This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 486.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the number of delay bits for the external trigger delay.

The variable <val> is expressed in bits.

***RST** +0

Range 0–1048576

Key Entry **Ext Delay Bits**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 486.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 486.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity of the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 486.

[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:EDGE[:STATe] ON|OFF|1|0
[:SOURce]:RADio:EDGE[:STATe]?
```

This command enables or disables the EDGE modulation format.

***RST** 0

Choices ON OFF 1 0

Key Entry **EDGE Off On**

Remarks Although the EDGE modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

GPS Subsystem–Option409 ([:SOURce]:RADio[1]|2|3|4:GPS)

:DATA

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:DATA PN9|PN15|FIX4|"<user file>"
[:SOURce]:RADio[1]|2|3|4:GPS:DATA?
```

This command sets the data type for the selected data mode.

***RST** PN9

Choices PN9 PN15 FIX4 "<user file>"

Key Entry **PN9** **PN15** **FIX4** **User file**

Remarks This command is only effective when the data mode is RAW or ENCoded. To set the data mode, refer to ":DMODe" .

:DMODe

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:DMODe RAW|ENCoded|TLM
[:SOURce]:RADio[1]|2|3|4:GPS:DMODe?
```

This command sets data mode.

RAW This choice modulates data onto the C/A (coarse acquisition) code at 50-bits per second. No parity bits are computed by the signal generator. Every 6 seconds, 300-bits from the source data are transmitted.

ENCoded This choice modulates data onto the C/A (coarse acquisition) code at 50-bits per second. The signal generator computes 6 parity bits for every 24 data bits from the selected data source. Every six seconds, 240-bits of the source data are transmitted along with 60-bits of computed parity.

TLM This choice transmits a standard default navigation data transmission which includes a telemetry word (TLM), a handover word (HOW), and default navigation data. The signal generator transmits an incrementing time-of-week (TOW) as part of the HOW.

***RST** RAW

Choices Raw Enc TLM

Key Entry **Data Mode Raw Enc TLM**

Remarks Since the TLM mode transmits default navigation data, there is no data selection for this mode.

For selecting the data type when RAW or ENCoded is the selection, refer to ":DATA" on page 491.

:DSHift

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:DSHift <val>
[:SOURce]:RADio[1]|2|3|4:GPS:DSHift?
```

This command sets the frequency and chip rate offsets to simulate a doppler shift.

The variable <val> is expressed in units of hertz (Hz to kHz).

***RST** +0.00000000E+000

Range –125 to 125

Key Entry **Doppler Shift**

Remarks N/A

:FILTer

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer?
```

This command sets the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower

passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ — This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection.

AC4Fm — This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

UGGaussian — This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<user FIR>" — This variable is any filter file that you have stored into memory.

***RST** RECT

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks N/A

:FILTer:ALPHa

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:ALPHa <val>
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:ALPHa?
```

This command sets the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum value (0), maximum value (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +2.20000000E-001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 492.

:FILTer:BBT

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:BBT <val>
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameters.

The filter BbT value can be set to the minimum value (0), the maximum value (1), or in between by using fractional numeric values (0.001–0.999)

***RST** +5.00000000E-001

Range 0.000–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 492.

:FILTer:CHANnel

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:CHANnel
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 492.

:IQPHase

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:IQPHase NORMal|INVerted
[:SOURce]:RADio[1]|2|3|4:GPS:IQPHase?
```

This command sets the I/Q phase for the GPS signal.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **IQ Phase Normal Invert**

Remarks N/A

:PCODe

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:PCODe <val>
[:SOURce]:RADio[1]|2|3|4:GPS:PCODe?
```

This command sets the P code power relative to the C/A code power.

***RST** –3

Range –40 to 0

Key Entry **P Code Pwr**

Remarks This command is normally used when the CAP (C/A+P) ranging mode choice is selected. Refer to ":RCODe" for selecting the ranging mode.

:RCODe

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:RCODe CA|P|CAP
[:SOURce]:RADio[1]|2|3|4:GPS:RCODe?
```

This command selects the ranging code for the GPS transmission.

CA This choice selects a 1023-bit pseudorandom C/A (coarse acquisition) code that is BPSK modulated onto the L1 (1575.42 MHz) carrier. The C/A code factory set chip rate is 1.023 Mcps using a 10.23 Mcps reference

clock.

P — This choice selects the precise (P) code which is a very long pseudorandom sequence that is BPSK modulated onto the L2 (1227.6 MHZ) carrier. The P code factory set chip rate is 10.23 Mcps using a 10.23 Mcps reference clock.

CAP — This choice permits both the C/A (coarse acquisition) and P (precise) codes to modulate the L1 (1575.42 MHz) carrier simultaneously by providing the P code on the Q component and the C/A code in quadrature on the I component.

***RST** CA

Choices CA P CAP

Key Entry **Ranging Code C/A P C/A+P**

Remarks N/A

:REFClk

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:REFClk [INT]|Ext
[:SOURce]:RADio[1]|2|3|4:GPS:REFClk?
```

This command sets the GPS reference clock to either internal or external.

INT — This selection sets the signal generator to use the internal chip clock.

EXT — This selection sets the signal generator to use an external chip clock which is supplied to the DATA CLOCK INPUT connector.

***RST** INT

Choices INT EXT

Key Entry **GPS Ref Clk**

Remarks N/A

:REFFreq

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:REFFreq <val><unit>
[:SOURce]:RADio[1]|2|3|4:GPS:REFFreq?
```

This command sets the GPS reference clock frequency. If an external source is being

used, its frequency must match the value set with this command

***RST** +1.02300000E+007

Range 1kCPS–12.5MCPS

Key Entry **GPS Ref (f0)**

Remarks Changing the GPS reference frequency will change the P and C/A code chip rates.

:SATid

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:SATid <val>
[:SOURce]:RADio[1]|2|3|4:GPS:SATid?
```

This command selects the pseudorandom number (PRN) code used for transmission.

Satellite identification numbers 1–32 are used for GPS satellites. Satellite identification numbers 33–37 are reserved for ground transmitter use in the real-world system.

***RST** +1

Range 1–37

Key Entry **Satellite ID**

Remarks N/A

[:STATe]

Supported All with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS[:STATe] ON|OFF|1|0
[:SOURce]:RADio[1]|2|3|4:GPS[:STATe]?
```

This command enables or disables the real-time GPS signal.

***RST** 0

Choices ON OFF 1 0

Key Entry **Real-time GPS Off On**

Remarks N/A

GSM Subsystem–Option 402 ([:SOURce]:RADio:GSM)

:ALPha

Supported All with Option 402

```
[:SOURce]:RADio:GSM:ALPHa <val>
[:SOURce]:RADio:GSM:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 511.

:BBCLock

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:GSM:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Choices INT[1] EXT[1]

Key Entry **BBG Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when

external mode is used.

This will be ignored if the external reference is set to EXTernal. To change the external refernce type, refer to ":EREFerence" on page 510.

:BBT

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BBT <val>
[:SOURce]:RADio:GSM:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +3.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 511.

:BRATe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BRATe <val>
[:SOURce]:RADio:GSM:BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.70833333E+005

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Mbps	1–50 Mbps
FSK2			
MSK			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
C4FM	2	2–100 Mbps	2–50 Mbps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry **Symbol Rate**

Remarks

When user-defined filters are selected using the command in section ":FILTer" on page 511, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see ":SRATe" on page 528).

A change in the bit rate value will affect the symbol rate value; refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514.

:BURSt:PN9

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:PN9 NORMal|QUICk
[:SOURce]:RADio:GSM:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Choices NORMal QUICk

Key Entry **PN9 Mode Normal Quick**

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPe:FALL:DELay

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –11.0625 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 502 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FALL:TIME

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.0625–127.9375

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 503 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FDELay

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:FDELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –11.0625 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal

generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 501 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FTIMe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:FTIMe?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +3.00000000E+000

Range 0.0625–127.9375

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 502 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RDELay

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:RDELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –8.0625 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 504 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –8.0625 to 99

Key Entry Rise Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 503 performs the same function; in

compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +3.00000000E+000

Range 0.0625–11.1875

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 505 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RTIMe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:GSM:BURSt:SHAPe:RTIMe?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +3.00000000E+000

Range 0.0625–11.1875

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514. Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 505 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:GSM:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either `SINE` or a user-defined file ("<file name>").

SINE — This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" — This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks N/A

:BURSt[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:GSM:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) — This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be

bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Choices ON OFF 1 0

Key Entry Data Format Pattern Framed

Remarks N/A

:CHANnel

Supported All with Option 402

```
[:SOURce]:RADio:GSM:CHANnel EVM|ACP
[:SOURce]:RADio:GSM:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** ACP

Choices EVM ACP

Key Entry Optimize FIR For Evm ACP

Remarks To change the current filter type, refer to ":FILTer" on page 511.

:DATA

Supported All with Option 402

```
[:SOURce]:RADio:GSM:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|
EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:GSM:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed

data transmission.

***RST** PN23

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DATA:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:GSM:DATA:FIX4 <val>
[:SOURce]:RADio:GSM:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the GSM modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported All with Option 402

```
[:SOURce]:RADio:GSM:DEFault
```

This command returns all of the GSM format parameters to their factory default conditions. It does not affect any other signal generator parameters.

***RST** N/A

Range N/A

Key Entry Restore GSM Factory Default

Remarks N/A

:DENCode

Supported All with Option 402

```
[:SOURce]:RADio:GSM:DENCode ON|OFF|1|0
[:SOURce]:RADio:GSM:DENCode?
```

This command enables or disables the differential data encoding function. Once this function is enabled, data bits are encoded prior to modulation; each modulated bit is 1 if the data bit is different from the previous one, or 0 if the data bit is the same as the previous one.

***RST** 1

Choices ON OFF 1 0

Key Entry **Diff Data Encode Off On**

Remarks N/A

:EDATa:DELay

Supported All with Option 402

```
[:SOURce]:RADio:GSM:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** N/A

Range N/A

Key Entry N/A

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported All with Option 402

```
[:SOURce]:RADio:GSM:EDCLock SYMBol|NORMal
[:SOURce]:RADio:GSM:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be

provided to the SYMBOL SYNC input connector.

NORMal — This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Choices SYMBol NORMal

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 498 to select EXT as the data clock type.

:EREFerence

Supported All with Option 402

```
[:SOURce]:RADio:GSM:EREFerence INT|EXT
[:SOURce]:RADio:GSM:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Choices INT EXT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 510 to enter the external reference frequency setting.

:EREFerence:VALue

Supported All with Option 402

```
[:SOURce]:RADio:GSM:EREFerence:VALue <val>
[:SOURce]:RADio:GSM:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 510 to select EXT (external source) as the reference for the bit-clock reference.

:FILTer

Supported All with Option 402

```
[:SOURce]:RADio:GSM:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:GSM:FILTer?
```

This command selects the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<User FIR>" This variable is any filter file that you have stored into memory.

***RST** GAUS

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:IQ:SCALe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:IQ:SCALe <val>
[:SOURce]:RADio:GSM:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:GSM:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 514.

Refer to ":SRATe" on page 528 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:GSM:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry Phase Dev

Remarks N/A

:MODulation:UFSK

Supported All with Option 402

```
[:SOURce]:RADio:GSM:MODulation:UFSK "<file name>"
[:SOURce]:RADio:GSM:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 514 to change the current

modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation:UIQ

Supported All with Option 402

```
[:SOURce]:RADio:GSM:MODulation:UIQ "<file name>"
[:SOURce]:RADio:GSM:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 514 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|
FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM256|UIQ|UFSK
[:SOURce]:RADio:GSM:MODulation[:TYPE]?
```

This command sets the modulation type for the GSM personality.

***RST** MSK

Choices BPSK QPSK IS95QPSK GRAYQPSK OQPSK IS95OQPSK π4DQPSK PSK8 PSK16 D8PSK MSK FSK2 FSK4 FSK8 FSK16 C4FM QAM4 QAM16 QAM32 QAM64 QAM256 UIQ UFSK

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **256QAM** **User I/Q** **User FSK**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:GSM:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Phase Polarity Normal Invert**

Remarks This command is useful for lower sideband mixing applications.

:SECondary:RECall

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

***RST** N/A

Range N/A

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 517.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 518.

:SECondary:SAVE

Supported All with Option 402

`[:SOURce]:RADio:GSM:SECondary:SAVE`

This command saves the current frame configuration as the secondary frame with the filename `GSM_SECONDARY_FRAME`.

***RST** N/A

Range N/A

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame state (saved in non-volatile signal generator memory), refer to ":SECondary:RECall" on page 516.

:SECondary:TRIGger[:SOURce]

Supported All with Option 402

`[:SOURce]:RADio:GSM:SECondary:TRIGger[:SOURce] KEY|EXT|BUS`
`[:SOURce]:RADio:GSM:SECondary:TRIGger[:SOURce]?`

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 532.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** N/A

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:SECondary[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:GSM:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Choices ON OFF 1 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 517.

:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption
PN9|PN15|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption?
```

This command creates and configures an access encrypted data field.

***RST** PN9

Choices PN9 PN15 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN15 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4 <val>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected access timeslot encryption field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAil

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAil <bit_pattern>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAil?
```

This command specifies the extended tail bits (8 bits) field for the selected access timeslot.

***RST** #H3A

Range #H00–#HFF

Key Entry **ET**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEQuence <bit_pattern>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEQuence?
```

This command specifies the synchronization sequence bits (41 bits) for the selected access timeslot.

***RST** #H096FF335478

Range #H0–#H1FFFFFFFFF

Key Entry **SS**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:ACCess:CUSTom

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom PN9|PN15|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom?
```

This command configures the data field for the selected custom timeslot.

***RST** PN9

Choices PN9 PN15 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9** **PN15** **FIX4** **User File** **Ext** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4 <val>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEQuence TSC0|
TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<bit_pattern>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEQuence?
```

This command changes the 26-bit dummy training sequence (TS) for the selected dummy timeslot.

***RST** #H0000000

Range <*bit_pattern*>: #H0–#H3FFFFFF

Choices TSC0 (0970897) TSC1 (0B778B7) TSC2 (10EE90E)
TSC3 (11ED11E) TSC4 (06B906B) TSC5 (13AC13A)
TSC6 (29F629F) TSC7 (3BC4BBC) <*bit_pattern*>

Key Entry **TSC0 TSC1 TSC2 TSC3 TSC4 TSC5 TSC6 TSC7 Custom TS**

Remarks When normal preset is selected, the preset hexadecimal value for TS reflects the GSM protocol, however you may use this command to enter a new value.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption
PN9|PN15|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64|TCHFS|CS1|DMCS1|UMCS1
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption?
```

This command creates and configures an encrypted data field for a normal timeslot.

***RST** PN9

Choices PN9 PN15 FIX4 "<file name>" EXT P4 P8 P16 P32
P64 TCHFS CS1 DMCS1 UMCS1

Key Entry **PN9 PN15 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's TCH/FS CS-1 Downlink MCS-1 Uplink MCS-1**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:CS1:DATA

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:CS1:DATA
PN9|PN15
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:CS1:DATA?
```

This command sets the bit pattern for the CS1 packet data traffic channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS1:DATA

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS1:
DATA PN9|PN15
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS1:
DATA?
```

This command sets the bit pattern for the downlink MCS1 packet data traffic channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4 <val>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected normal timeslot encryption field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:TCH:FS:DATA

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:TCH:FS:DATA
PN9|PN15
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:TCH:FS:DATA?
```

This command sets the bit pattern for the TCH/FS channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS1:DATA

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS1:
DATA PN9|PN15
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS1:
DATA?
```

This command sets the bit pattern for the uplink MCS1 packet data traffic channel.

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:STEal

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:STEal <val>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:STEal?
```

This command specifies the normal stealing bits for the selected timeslot. The single bit defines the value for both 1-bit fields.

***RST** #H0

Range #H0–#H1

Key Entry **S**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence
TSC0|TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<bit_pattern>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence?
```

This command changes the 26-bit training sequence (TS) for a normal timeslot. The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command. The hexadecimal values for the 8 training sequence codes are listed below:

***RST** #H0000000

Range <*bit_pattern*>: #H0–#H3FFFFFF

Choices TSC0 (0970897) TSC1 (0B778B7) TSC2 (10EE90E)
TSC3 (11ED11E) TSC4 (06B906B) TSC5 (13AC13A)
TSC6 (29F629F) TSC7 (3BC4BBC) <*bit_pattern*>

Key Entry **TSC0** **TSC1** **TSC2** **TSC3** **TSC4** **TSC5** **TSC6** **TSC7**
Custom TS

Remarks The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command.

:SLOT0|[1]|2|3|4|5|6|7:POWer

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:POWer MAIN|DELTa
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:POWer?
```

This command defines the RF output power level for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:STATe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:STATe ON|OFF|1|0
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:STATe?
```

This command enables or disables the operating state of the selected timeslot.

***RST** *Timeslot 0*: 1 *Timeslot 1–7*: 0

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption?
```

This command creates and configures an encrypted data field for a synchronization timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption:FIX4 <val>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected synchronization timeslot encryption field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEQuence <bit_pattern>
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEQuence?
```

This command customizes the training sequence (TS) for the selected synchronization timeslot. The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command.

***RST** #HB962040F2D45761B

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry TS

Remarks N/A

:SLOT0|[1]|2|3|4|5|6|7[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7[:TYPE] CUSTom|NORMal|
FCORrection|SYNC|DUMMy|ACCess|NORMAL_ALL
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

***RST** NORMAL

Choices CUSTom NORMal FCORrection SYNC DUMMy ACCess

NORMAL_ALL

Key Entry **Custom** **Normal** **FCorr** **Sync** **Dummy** **Access** **Normal All**

Remarks N/A

:SOUT

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:GSM:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks N/A

:SOUT:OFFSet

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SOUT:OFFSet <val>
[:SOURce]:RADio:GSM:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range –155 to 155

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 527.

:SOUT:SLOT

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SOUT:SLOT <val>
[:SOURce]:RADio:GSM:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +0

Range 0–7

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 527.

:SRATe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:SRATe <val>
[:SOURce]:RADio:GSM:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.70833333E+005

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 511, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well as the actual filter response (see ":BRATe" on page 499).

A change in the symbol rate value will affect the bit rate value; refer to ":BRATe" on page 499 for a list of the minimum and maximum symbol

rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 514.

:TRIGger:TYPE

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:GSM:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 530.
SINGle	The framed data sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:GSM:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE	This choice immediately transmits a framed data sequence that is continuously repeated.
TRIGger	This choice causes the framed data sequence to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated framed data sequence begins.

RESet This choice immediately restarts a continuously repeated framed data sequence upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 530.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:GSM:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select GATE as the ARB trigger type, refer to ":TRIGger:TYPE" on page 530.

:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:GSM:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the

rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 532.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** KEY

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|
EPT2|EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 531.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the number of delay bits for the external trigger delay.

The variable <val> is expressed in bits.

***RST** +0

Range 0–1048576

Key Entry **Ext Delay Bits**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 531.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 402

```
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity for the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 531.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 402

```
[:SOURce]:RADio[:GSM:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:GSM:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 531.

[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:GSM[:STATe] ON|OFF|1|0
[:SOURce]:RADio:GSM[:STATe]?
```

This command enables or disables the GSM modulation format.

***RST** 0

Choices ON OFF 1 0

Key Entry **GSM Off On**

Remarks Although the GSM modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

Input Subsystem–Option UN7 (:INPut:BERT[: BASeband])

:CGATe:DELay:CLOCk

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay:CLOCk <val>
:INPut:BERT[:BASeband]:CGATe:DELay:CLOCk?
```

This command sets the number of delay bits for the signal applied to the BER GATE IN rear panel connector.

One bit corresponds with one bit of delay for the input clock.

***RST** 1

Range 1–16384

Key Entry **Gate Clk Delay**

Remarks The gate delay mode must be set to CLOCk for this command to work. Refer to ":CGATe:DELay:MODE". Also, the gate and gate delay must be enabled for this command to work. Refer to ":CGATe[:STATe]" on page 537 and ":CGATe:DELay[:STATe]" on page 536.

:CGATe:DELay:MODE

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay:MODE TIME|CLOCk
:INPut:BERT[:BASeband]:CGATe:DELay:MODE:?
```

This command selects the operating mode of the gate delay.

TIME This choice selects the time mode which makes it possible to set the gate time delay in absolute time and the resolution.

CLOCk This choice selects the clock mode which enable you to set the gate delay by a set number of bits.

***RST** TIME

Choices TIME CLOCk

Key Entry **Gate Mode Time Clk**

Remarks The gate state and gate delay state must be enabled for this command

to work. Refer to ":CGATe[:STATe]" on page 537 and ":CGATe:DELay[:STATe]" on page 536.

:CGATe:DELay:TIME

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay:TIME <val><unit>
:INPut:BERT[:BASeband]:CGATe:DELay:TIME?
```

This command sets the delay time of the gate signal. The gate delay time must be the multiple of the minimum resolution value and if not, the delay resolution is automatically rounded to the nearest multiplied value of the gate time delay value.

The variable <val> is expressed in units of seconds (s), milliseconds (ms), microseconds (µs), and nanoseconds (ns).

***RST** +2.67000000E–008

Range 2.67 ns–1.0 s

Key Entry **Gate Time Delay**

Remarks The gate delay mode must be set to TIME for this command to work. Refer to ":CGATe:DELay:MODE" on page 535. Also, the gate and gate delay must be enabled for this command to work. Refer to ":CGATe[:STATe]" on page 537 and ":CGATe:DELay[:STATe]" on page 536.

To set the resolution, refer to ":CLOCk:DELAy:RESolution" on page 538.

:CGATe:DELay[:STATe]

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay[:STATe] ON|OFF|1|0
:INPut:BERT[:BASeband]:CGATe:DELay[:STATe]?
```

This command enables or disables the operating state of the gate delay.

ON This choice enables the gate delay adjustment function.

OFF This choice disables the gate delay adjustment function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Gate Delay Off On**

Remarks The gate must be enabled for this command to work. To enable the gate, refer to ":CGATe[:STATe]" on page 537.

:CGATe:POLarity

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:POLarity POSitive|NEGative
:INPut:BERT[:BASeband]:CGATe:POLarity?
```

This command sets the input polarity of the gate signal supplied to the BER GATE IN rear panel connector.

POS With this choice, the signal is valid when the gate signal is high.

NEG With this choice, the signal is valid when the gate signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **Gate Polarity Neg Pos**

Remarks N/A

:CGATe[:STATe]

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CGATe[:STATe] ON|OFF|1|0
:INPut:BERT[:BASeband]:CGATe[:STATe]?
```

This command sets the operating state of the clock gate function.

ON This choice enables the clock gate function.

OFF This choice disables the clock gate function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Gate Off On**

Remarks N/A

:CLOCk:DELAy:RESolution

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:DELay:RESolution <val><unit>
:INPut:BERT[:BASeband]:CLOCk:DELay:RESolution?
```

This command sets the resolution of the clock delay. The minimum resolution is 13.3 ns and it corresponds to 1/75 MHz. The 75 MHz is the sampling clock for the BERT board. The input value must be a multiple of the minimum resolution. If the set value is not a multiple value, the delay resolution is automatically rounded to the nearest multiple value with reference to the set value.

***RST** +1.33000000E–008

Range 13.3ns–80µs

Key Entry **Resolution**

Remarks The clock delay or the gate delay must be enabled for this command to work. Refer to ":CLOCk:DELAy[:STATe]" on page 539 and ":CGATe:DELay[:STATe]" on page 536. A change in the resolution value can affect both the clock and the gate delay time automatically.

:CLOCk:DELAy:TIME

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:DELay:TIME <val><unit>
:INPut:BERT[:BASeband]:CLOCk:DELay:TIME?
```

This command sets the clock signal delay time.

The variable <val> is expressed in units of seconds (s), milliseconds (ms), microseconds (µs), and nanoseconds (ns).

***RST** +2.67000000E–008

Range 26.7ns–999.9967600ms

Key Entry **Clock Time Delay**

Remarks The clock delay must be enabled for this command to work. Refer to ":CLOCk:DELAy[:STATe]" on page 539.

:CLOCk:DELAy[:STATe]

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:DELay[:STATe] ON|OFF|1|0
:INPut:BERT[:BASeband]:CLOCk:DELay[:STATe]?
```

This command sets the operating state of the clock delay function.

ON This choice enables the clock delay adjustment.

OFF This choice disables the clock delay adjustment.

***RST** 0

Choices ON OFF 1 0

Key Entry **Clock Delay Off On**

Remarks N/A

:CLOCk:POLarity

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:POLarity POSitive|NEGative
:INPut:BERT[:BASeband]:CLOCk:POLarity?
```

This command sets the input polarity of the clock signal supplied to the BER CLK IN rear panel connector.

POS With this choice, the signal is valid when the clock signal is high.

NEG With this choice, the signal is valid when the clock signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **Clock Polarity Neg Pos**

Remarks N/A

:DATA:POLarity

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:DATA:POLarity POSitive|NEGative
:INPut:BERT[:BASeband]:DATA:POLarity?
```

This command sets the input polarity of the data signal supplied to the BER DATA IN

rear panel connector.

POS	With this choice, the signal is valid when the data signal is high.
NEG	With this choice, the signal is valid when the data signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **Data Polarity Neg Pos**

Remarks N/A

:IMPedance

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:IMPedance OHM_75|HIGH
:INPut:BERT[:BASeband]:IMPedance?
```

This command sets the input termination mode of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

***RST** HIGH

Choices OHM_75 HIGH

Key Entry **Impedance 75 Ohm High**

Remarks N/A

:THReshold

Supported All with Option UN7

```
:INPut:BERT[:BASeband]:THReshold V0_7|V1_4|V1_65|V2_5
:INPut:BERT[:BASeband]:THReshold?
```

This command sets the threshold voltage level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

V0_7	This choice selects 0.7 volts (normal TTL) as the turn-on voltage for the input signal.
V1_4	This choice selects 1.4 volts (Schmit TTL) as the turn-on voltage for the input signal.
V1_65	This choice selects 1.65 volts (CMOS 3.3 volts is the maximum operating range) as the turn-on voltage for the input signal.

V2_5 This choice selects 2.5 volts (CMOS 5 volts is the maximum operating range) as the turn-on voltage for the input signal.

***RST** V1_4

Choices V0_7 V1_4 V1_65 V2_5

Key Entry **0.7V** **1.4V** **1.65V** **2.5V**

Remarks N/A

Measure Subsystem–Option 300 (:MEASure[:SCALar]:BERT:BTS:LOOPback)

:EDGE:MCS5[:SENSitivity]

Supported All with Option 300

`:MEASure[:SCALAR]:BERT:BTS:LOOPback:EDGE:MCS5[:SENSitivity]?`

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message "`Fail, –999.00`" is displayed.

There are two other status errors that may be returned; `SERR` or `DERR`.

`SERR` This indicates that RF synchronization is lost during search and the search is aborted.

`DERR` This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

***RST** N/A

Range N/A

Key Entry N/A

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

:EDGE:MCS9[:SENSitivity]

Supported All with Option 300

`:MEASure[:SCALAR]:BERT:BTS:LOOPback:EDGE:MCS9[:SENSitivity]?`

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with

the BTS, the message "Fail, –999.00" is displayed.

There are two other status errors that may be returned; SERR or DERR.

SERR This indicates that RF synchronization is lost during search and the search is aborted.

DERR This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

***RST** N/A

Range N/A

Key Entry N/A

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

:EDGE:UNCoded[:SENSitivity]

Supported All with Option 300

```
:MEASure[:SCALAR]:BERT:BTS:LOOPback:EDGE:UNCoded[:SENSitivity]?
```

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message "Fail, –999.00" is displayed.

There are two other status errors that may be returned; SERR or DERR.

SERR This indicates that RF synchronization is lost during search and the search is aborted.

DERR This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

***RST** N/A

Range N/A

Key Entry N/A

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

:GSM[:SENSitivity]

Supported All with Option 300

`:MEASure[:SCALAR]:BERT:BTS:LOOPback:GSM[:SENSitivity]?`

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message "`Fail, –999.00`" is displayed.

There are two other status errors that may be returned; `SERR` or `DERR`.

`SERR` This indicates that RF synchronization is lost during search and the search is aborted.

`DERR` This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

***RST** N/A

Range N/A

Key Entry N/A

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

Multitone Subsystem–Option 001 or 002 ([:SOURce]:RADio:MTONe:ARB)

Creating a Multitone Waveform

Use the following steps to create a multitone waveform:

1. Initialize the phase for the multitone waveform. Refer to ":SETup:TABLe:PHASe:INITialize" on page 549.
2. Assign the frequency spacing between the tones. Refer to ":SETup:TABLe:FSPacing" on page 548.
3. Define the number of tones within the waveform. Refer to ":SETup:TABLe:NTONes" on page 548.
4. Modify the power level, phase, and state of any individual tones. Refer to ":ROW" on page 550.

:REFerence:EXTernal:FREQuency

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:REFerence:EXTernal:FREQuency <val>
[:SOURce]:RADio:MTONe:ARB:REFerence:EXTernal:FREQuency?
```

This command allows you to enter the frequency of the applied external reference.

The variable <val> is expressed in units of Hertz (Hz–MHz).

***RST** +1.00000000E+007

Range 2.5E5–1E8

Key Entry **Reference Freq**

Remarks The value specified by this command is effective only when you are using an external ARB reference applied to the BASEBAND GEN REF IN rear panel connector.

To specify external as the ARB reference source type, refer to ":REFerence[:SOURce]" on page 546.

:REFerence[:SOURce]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:REFerence[:SOURce] INTernal|EXTernal
[:SOURce]:RADio:MTONe:ARB:REFerence[:SOURce]?
```

This command selects either an internal or external reference for the waveform clock.

***RST** INT

Choices INTernal EXTernal

Key Entry **ARB Reference Ext Int**

Remarks If the EXTernal choice is selected, the external frequency value must be entered and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":REFerence:EXTernal:FREQuency" on page 545 to enter the external reference frequency.

:SETup

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup "<file name>"
[:SOURce]:RADio:MTONe:ARB:SETup?
```

This command retrieves a multitone waveform file.

***RST** N/A

Range N/A

Key Entry **Load From Selected File**

Remarks The name of a multitone waveform file is stored in the signal generator file system of MTONE files. This information is held in memory until you send the command that turns the waveform on.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SETup:STORe

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:STORe "<file name>"
```

This command stores the current multitone waveform setup in the signal generator file system of MTONE files.

***RST** N/A

Range N/A

Key Entry **Store To File**

Remarks N/A

:SETup:TABLe

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe <freq_spacing>,
<num_tones>,{<phase>,<state>}
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe?
```

This command creates and configures a multitone waveform.

The frequency offset, power, phase, and state value are returned when a query is initiated. The output format is as follows:

```
<frequency offset>,<power>,<phase>,<state>
```

The variable <freq_spacing> is expressed in units of Hertz (Hz–MHz).

The variable <power> is expressed in units of decibels (dB).

***RST**

Tone	*<frequency offset>*	*<power>*	*<phase>*	*<state>*
Tone 1	-35000	+0.00000000E+000	+0	+1
Tone 2	-25000	+0.00000000E+000	+0	+1
Tone 3	-15000	+0.00000000E+000	+0	+1
Tone 4	-5000	+0.00000000E+000	+0	+1
Tone 5	+5000	+0.00000000E+000	+0	+1
Tone 6	+15000	+0.00000000E+000	+0	+1
Tone 7	+25000	+0.00000000E+000	+0	+1
Tone 8	+35000	+0.00000000E+000	+0	+1

Range *<freq_spacing>* (2 tones): 1E4–8E7 *<num_tones>*: 2–64

<freq_spacing> (>2 tones): 1E4 to (80 MHz ÷ (num_tones – 1))

<phase>: 0–359

Key Entry **Freq Spacing** **Number Of Tones** **Toggle State**

Remarks To set the frequency spacing, refer to ":SETup:TABLe:FSPacing" on page 548.

:SETup:TABLe:FSPacing

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:FSPacing <freq_spacing>
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:FSPacing?
```

This command sets the frequency spacing between the tones.

The variable <freq_spacing> is expressed in units of Hertz (Hz–MHz).

***RST** +1.00000000E+004

Range *<freq_spacing>* (2 tones): 1E4–8E7

<freq_spacing> (>2 tones): 1E4 to (80 MHz ÷ (num_tones – 1))

Key Entry **Freq Spacing**

Remarks To set frequency spacing and additional parameters required to create or configure a multitone waveform, refer to ":SETup:TABLe" on page 547.

This command is the second step in creating a multitone waveform. Refer to "Creating a Multitone Waveform" on page 545 for all four steps.

:SETup:TABLe:NTONes

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:NTONes <num_tones>
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:NTONes?
```

This command defines the number of tones in the multitone waveform.

***RST** +8

Range 2–64

Key Entry **Number Of Tones**

Remarks To specify the number of tones and additional parameters required to create or configure a multitone waveform, refer to ":SETup:TABLe" on page 547.

This command is the third step in creating a multitone waveform. Refer to "Creating a Multitone Waveform" on page 545 for all four steps.

:SETup:TABLe:PHASe:INITialize

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:PHASe:INITialize FIXed|RANDom
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:PHASe:INITialize?
```

This command initializes the phase in the multitone waveform table.

FIXed This choice sets the phase of all tones to the fixed value of 0 degrees.

RANDom This choice sets the phase of all tones to random values based on the setting on the random seed generator.

***RST** FIX

Choices FIXed RANDom

Key Entry **Initialize Phase Fixed Random**

Remarks To change the random number generator seed value, refer to ":SETup:TABLe:PHASe:INITialize:SEED" on page 549.

This command is the first step in creating a multitone waveform. Refer to "Creating a Multitone Waveform" on page 545 for all four steps.

:SETup:TABLe:PHASe:INITialize:SEED

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:PHASe:INITialize:SEED FIXed|RANDom
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:PHASe:INITialize:SEED?
```

This command initializes the random number generator seed that is used to generate the random phase values for the multitone waveform.

FIXed This choice sets the random number generator seed to a fixed value.

RANDom This choice sets the random number generator seed to a random value. This changes the phase value after each initialization of the phase.

***RST** FIX

Choices FIXed RANDom

Key Entry **Random Seed Fixed Random**

Remarks N/A

:ROW

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:ROW <row_number>,<power>,
<phase>,<state>
[:SOURce]:RADio:MTONe:ARB:SETup:TABLe:ROW? <row_number>
```

This command modifies the indicated tone (row) of the multitone waveform.

<row_number> The number of rows for this variable are determined by the :SETup:TABLe command.

The variable <power> is expressed in units of decibels (dB).

The variable <phase> is expressed in units of degrees (deg).

Frequency offset, power, phase, and state value are returned when a query is initiated. The output format is as follows:

```
<frequency offset>,<power>,<phase>,<state>
```

***RST** *frequency offset*: –3.50000000E+004 <*power*>: +0.00000000E+000 <*phase*>: +0.00000000E+000 <*state*>: 1

Range *frequency offset*: –4E7 to 4E7 <*power*>: –80 to 0 <*phase*>: 0–359 <*state*>: 1

Key Entry **Goto Row** **Toggle State**

Remarks Refer to ":SETup:TABLe" on page 547 for information on how to change the number of rows.

This command is the final step in creating a multitone waveform. Refer to "Creating a Multitone Waveform" on page 545 for all four steps.

[:STATe]

Supported All with Option 001 or 002

```
[:SOURce]:RADio:MTONe:ARB[:STATe] ON|OFF|1|0
[:SOURce]:RADio:MTONe:ARB[:STATe]?
```

This command enables or disables the multitone waveform generator function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Multitone Off On**

Remarks N/A

NADC Subsystem–Option 402 ([:SOURce]:RADio[:NADC])

:ALPha

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:ALPHa <val>
[:SOURce]:RADio[:NADC]:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +3.50000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks This command is effective only after choosing a root Nyquist or Nyquist filter; it does not effect other types of filters.

To change the current filter type, refer to ":FILTer" on page 566.

:BBCLock

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio[:NADC]:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Choices INT[1] EXT[1]

Key Entry **BBG Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BBT <val>
[:SOURce]:RADio[:NADC]:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry Filter BbT

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 566.

:BRATe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BRATe <val>
[:SOURce]:RADio[:NADC]:BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +4.86000000E+004

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Mbps	1–50 Mbps
FSK2			
MSK			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
C4FM	2	2–100 Mbps	2–50 Mbps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry **Symbol Rate**

Remarks

When user-defined filters are selected using the command in section ":FILTer" on page 566, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see ":SRATe" on page 581).

A change in the bit rate value will affect the symbol rate value; refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570.

:BURSt:PN9

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:PN9 NORMal|QUICk
[:SOURce]:RADio[:NADC]:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Choices NORMal QUICk

Key Entry **PN9 Mode Normal Quick**

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio[:NADC]:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either `SINE` or a user-defined file ("<file name>").

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks N/A

:BURSt:SHAPe:FALL:DELay

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 557 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FALL:TIME

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +5.00000000E+000

Range 0.1250–255.8750

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal

generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 557 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FDELay

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FDELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 556 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FTIMe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:FTIMe?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range 0.1250–255.8750

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 556 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RDELay

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RDELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –17.3750 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 559 performs the same

function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –17.3750 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 558 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +5.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 560 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RTIMe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio[:NADC]:BURSt:SHAPe:RTIMe?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +5.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570. Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 559 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio[:NADC]:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Choices ON OFF 1 0

Key Entry Data Format Pattern Framed

Remarks N/A

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio[:NADC]:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

SINE — This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" — This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks N/A

:CHANnel

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:CHANnel EVM|ACP
[:SOURce]:RADio[:NADC]:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM — This choice provides the most ideal passband.

ACP — This choice improves stopband rejection.

***RST** ACP

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 566.

:DATA

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|
EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio[:NADC]:DATA?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for unframed transmission.

***RST** PN23

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DATA:FIX4

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:DATA:FIX4 <val>
[:SOURce]:RADio[:NADC]:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the NADC modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:DEFault
```

This command returns all of the NADC modulation format parameters to factory settings. It does not affect any other signal generator parameters.

***RST** N/A

Range N/A

Key Entry **Restore NADC Factory Default**

Remarks N/A

:EDATa:DELay

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** N/A

Range N/A

Key Entry N/A

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:EDCLock SYMBol|NORMal
[:SOURce]:RADio[:NADC]:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Choices SYMBol NORMal

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 552 to select EXT as the data clock type.

:EREFerence

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:EREFerence INT|EXT
[:SOURce]:RADio[:NADC]:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Choices INT EXT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 565 to enter the external reference frequency setting.

:EREFerence:VALue

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:EREFerence:VALue <val>
[:SOURce]:RADio[:NADC]:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are

using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 565 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|IS95|
IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio[:NADC]:FILTer?
```

This command selects the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<User FIR>"	This variable is any filter file that you have stored into memory.

***RST** RNYQ

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:FRATe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:FRATe FULL|HALF
[:SOURce]:RADio[:NADC]:FRATe?
```

This command toggles between a full- or half-rate traffic channel.

FULL Selects two equally spaced timeslots of the frame. Since there are six timeslots per frame, timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.

HALF Selects one timeslot of the frame (6 individual timeslots per frame).

***RST** FULL

Choices FULL HALF

Key Entry **Rate Full Half**

Remarks N/A

:IQ:SCALe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:IQ:SCALe <val>
[:SOURce]:RADio[:NADC]:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio[:NADC]:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 570.

Refer to ":SRATe" on page 581 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio[:NADC]:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

Remarks N/A

:MODulation:UFSK

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:MODulation:UFSK "<file name>"
[:SOURce]:RADio[:NADC]:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 570 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation:UIQ

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:MODulation:UIQ "<file name>"
[:SOURce]:RADio[:NADC]:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 570 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|
FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM256|UIQ|UFSK
[:SOURce]:RADio[:NADC]:MODulation[:TYPE]?
```

This command sets the modulation type for the NADC personality.

***RST** P4DQPSK

Choices BPSK QPSK IS95QPSK GRAYQPSK OQPSK IS95OQPSK π4DQPSK PSK8 PSK16 D8PSK MSK FSK2 FSK4 FSK8 FSK16 C4FM QAM4 QAM16 QAM32 QAM64 QAM256 UIQ UFSK

Key Entry **BPSK QPSK IS-95 QPSK Gray Coded QPSK OQPSK IS-95 OQPSK π/4 DQPSK 8PSK 16PSK D8PSK MSK 2-Lvl FSK 4-Lvl FSK 8-Lvl FSK 16-Lvl FSK C4FM 4QAM 16QAM 32QAM 64QAM 256QAM User I/Q User FSK**

Remarks N/A

:REPeat

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:REPeat SINGle|CONTinuous
[:SOURce]:RADio[:NADC]:REPeat?
```

This command sets the rotation direction of the phase modulation vector.

SINGle This choice outputs one occurrence of the selected frame.

CONTinuous This choice outputs a continuous stream of the selected frame.

***RST** SING

Choices SINGle CONTinuous

Key Entry **Frame Repeat Single Cont**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio[:NADC]:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Polarity Normal Invert**

Remarks N/A

:SECondary:RECall

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

***RST** N/A

Range N/A

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 571.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 572.

:SECondary:SAVE

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SECondary:SAVE
```

This command saves the current frame configuration as the secondary frame with the filename NADC_SECONDARY_FRAME.

***RST** N/A

Range N/A

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to ":SECondary:RECall" on page 571.

:SECondary:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SECondary:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio[:NADC]:SECondary:TRIGger[:SOURce]?
```

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 585.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** N/A

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:SECondary[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio[:NADC]:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Choices ON OFF 1 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 571.

:SLOT[1]|2|3|4|5|6:DCUStom

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DCUStom
PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DCUStom?
```

This command configures the data field for the selected downlink custom timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4|5|6:DCUStom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DCUStom:FIX4 <val>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4|5|6:DTCHannel:CDLocator

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:
CDLocator <bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:CDLocator?
```

This command changes the 11-bit coded digital control channel locator (CDL) field.

***RST** #H000

Range #H0–#H7FF

Key Entry CDL

Remarks The preset hexadecimal value (when normal preset is selected) for CDL reflects the NADC protocol, however you can enter a new value by using this command.

:SLOT[1]|2|3|4|5|6:DTCHannel:CDVCcode

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:
CDVCcode <bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:CDVCcode?
```

This command changes the 12-bit coded digital verification color code (CDVCC).

***RST** #H000

Range #H0–#HFFF

Key Entry CDVCC

Remarks The preset hexadecimal value (when normal preset is selected) for CDVCC reflects the NADC protocol, however you can enter a new value by using this command.

:SLOT[1]|2|3|4|5|6:DTCHannel:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:
SACChannel <bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel.

***RST** #H000

Range #H0–#HFFF

Key Entry SACCH

Remarks The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd <bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd?
```

This command sets the 28-bit synchronization word as the active function. This is used for slot synchronization, equalizer training, and timeslot identification.

***RST** #HA91DE4A

Range #H0–#HFFFFFFF

Key Entry SYNC

Remarks N/A

:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA] PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for the selected downlink traffic channel timeslot during framed transmission.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **EXT** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]FIX4

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]:FIX4 <val>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4|5|6:POWer

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:POWer MAIN|DELTa
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:SLOT[1]|2|3|4|5|6:STATe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:STATe ON|OFF|1|0
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:STATe?
```

This command enables or disables the operating state of the selected timeslot.

***RST** *Timeslot 1*: 1 *Timeslots 2–6*: 0

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks N/A

:SLOT[1]|2|3|4|5|6:UCUStom

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom?
```

This command configures the data field for the selected uplink custom timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **EXT** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4|5|6:UCUStom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom:FIX4 <val>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4|5|6:UTCHannel:CDVCcode

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:
CDVCcode <bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:CDVCcode?
```

This command changes the 12-bit coded digital verification color code (CDVCC).

***RST** #H000

Range #H0–#HFFF

Key Entry CDVCC

Remarks The preset hexadecimal value (when normal preset is selected) for CDVCC reflects the NADC protocol, however you can enter a new value by using this command.

:SLOT[1]|2|3|4|5|6:UTCHannel:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:SACChannel
<bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel.

***RST** #H000

Range #H0–#HFFF

Key Entry SACCH

Remarks The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

:SLOT[1]|2|3|4|5|6:UTCHannel:SWORd

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:SWORd <bit_pattern>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:SWORd?
```

This command sets the 28-bit synchronization word as the active function. This is used for slot synchronization, equalizer training, and timeslot identification.

***RST** #HA91DE4A

Range #H0–#HFFFFFFFF

Key Entry **SYNC**

Remarks N/A

:SLOT[1]|2|3|4|5|6:UTCHannel[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel[:DATA] PN9|PN15|
FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel[:DATA]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for the selected uplink traffic channel timeslot during framed transmission.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **EXT** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4|5|6:UTCHannel[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel[:DATA]:FIX4 <val>
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4|5|6[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6[:TYPE] UCUStom|DCUStom|UTCH|
UTCH_ALL|DTCH|DTCH_ALL
[:SOURce]:RADio[:NADC]:SLOT[1]|2|3|4|5|6[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

***RST** *Timeslot 1*: UTCH *Timeslots 2–6*: UCUS

Choices UCUStom DCUStom UTCH UTCH_ALL DTCH DTCH_ALL

Key Entry **Up Custom** **Down Custom** **Up TCH** **Up TCH All** **Down TCH** **Down TCH All**

Remarks N/A

:SOUT

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio[:NADC]:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks N/A

:SOUT:OFFSet

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SOUT:OFFSet <val>
[:SOURce]:RADio[:NADC]:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range –323 to 323

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 580.

:SOUT:SLOT

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SOUT:SLOT <val>
[:SOURce]:RADio[:NADC]:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +1

Range 1–3

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 580.

:SRATe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:SRATe <val>
[:SOURce]:RADio[:NADC]:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.43000000E+004

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 566, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well as the actual filter response (see ":BRATe" on page 553).

A change in the symbol rate value will affect the bit rate value; refer to ":BRATe" on page 553 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 570.

:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 585.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** KEY

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:TRIGger:TYPE

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio[:NADC]:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous — The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 584.

SINGle — The framed data sequence plays once for every trigger received.

GATE — An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio[:NADC]:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE — This choice immediately transmits a framed data sequence that is continuously repeated.

TRIGger — This choice causes the framed data sequence to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated framed data sequence begins.

RESet — This choice immediately restarts a continuously repeated framed data sequence upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 583.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio[:NADC]:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry Gate Active Low High

Remarks To select GATE as the ARB trigger type, refer to ":TRIGger:TYPE" on page 583.

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|EJPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external

signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks To change the trigger source to EXT, refer to ":TRIGger[:SOURce]" on page 583.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the number of delay bits for the external trigger delay.

The variable <val> is expressed in bits.

***RST** +0

Range 0–1048576

Key Entry **Ext Delay Bits**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 583.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 583.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 402

```
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio[:NADC]:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity of the external trigger.

***RST** POS

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 583.

[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio[:NADC][:STATe] ON|OFF|1|0
[:SOURce]:RADio[:NADC][:STATe]?
```

This command enables or disables the NADC modulation format.

***RST** OFF

Choices ON OFF 1 0

Key Entry **NADC Off On**

Remarks Although the NADC modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)

:ALPha

Supported All with Option 402

```
[:SOURce]:RADio:PDC:ALPHa <val>
[:SOURce]:RADio:PDC:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 601.

:BBCLock

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:PDC:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Choices INT EXT

Key Entry **Ext Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BBT <val>
[:SOURce]:RADio:PDC:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 601.

:BRATe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BRATe <val>
[:SOURce]:RADio:PDC:BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +4.20000000E+004

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Mbps	1–50 Mbps
FSK2			
MSK			
C4FM	2	2–100 Mbps	2–50 Mbps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
QPSK	2	2–100 Mbps	2–50 Mbps
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 601, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see ":SRATe" on page 616).

A change in the bit rate value will affect the value of the symbol rate; refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604.

:BURSt:PN9

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:PN9 NORMal|QUICk
[:SOURce]:RADio:PDC:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Choices NORMal QUICk

Key Entry **PN9 Mode Normal Quick**

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPe:FALL:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:FALL:DELay?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 592 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FALL:TIME

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:FALL:TIME?
```

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 593 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FDELay

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:FDELay?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 591 performs the same

function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FTIMe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:FTIMe?
```

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range 0.1250–255.8750

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 591 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RDELay

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:RDELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –18.3750 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 594 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:RISE:DELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –18.3750 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 593 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:RISE:TIME?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 595 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RTIMe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:PDC:BURSt:SHAPe:RTIMe?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604. Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 595 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:PDC:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either `SINE` or a user-defined file ("<file name>").

SINE — This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" — This choice selects a user designated file from signal generator memory.

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks N/A

:BURSt[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:PDC:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) — This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Choices ON OFF 1 0

Key Entry **Data Format Pattern Framed**

Remarks N/A

:CHANnel

Supported All with Option 402

```
[:SOURce]:RADio:PDC:CHANnel EVM|ACP
[:SOURce]:RADio:PDC:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 601.

:DATA

Supported All with Option 402

```
[:SOURce]:RADio:PDC:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|
EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST** PN23

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DATA:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PDC:DATA:FIX4 <val>
[:SOURce]:RADio:PDC:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the protocols (modulation type, symbol rate, filter, and burst shape) selected for the PDC format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported All with Option 402

```
[:SOURce]:RADio:PDC:DEFault
```

This command returns all of the PDC modulation format parameters to factory settings. It does not affect any other signal generator parameters.

***RST** N/A

Range N/A

Key Entry **Restore PDC Factory Default**

Remarks N/A

:EDATa:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PDC:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** N/A

Range N/A

Key Entry N/A

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported All with Option 402

```
[:SOURce]:RADio:PDC:EDCLock SYMBol|NORMal
[:SOURce]:RADio:PDC:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Choices SYMBol NORMal

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 588 to select EXT as the data clock type.

:EREFerence

Supported All with Option 402

```
[:SOURce]:RADio:PDC:EREFerence INT|EXT
[:SOURce]:RADio:PDC:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Choices INT EXT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 600 to enter the external reference frequency setting.

:EREFerence:VALue

Supported All with Option 402

```
[:SOURce]:RADio:PDC:EREFerence:VALue <val>
[:SOURce]:RADio:PDC:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 600 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported All with Option 402

```
[:SOURce]:RADio:PDC:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:PDC:FILTer?
```

This command selects the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<User FIR>"	This variable is any filter file that you have stored into memory.

***RST** RYNQ

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:FRATe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:FRATe FULL|HALF
[:SOURce]:RADio:PDC:FRATe?
```

This command toggles between a full- or half-rate traffic channel.

FULL Selects two equally spaced timeslots of the frame. Since there are six timeslots per frame, timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.

HALF Selects one timeslot of the frame (6 individual timeslots per frame).

***RST** FULL

Choices FULL HALF

Key Entry **Rate Full Half**

Remarks N/A

:IQ:SCALe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:IQ:SCALe <val>
[:SOURce]:RADio:PDC:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:PDC:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 604.

Refer to ":SRATe" on page 616 for a list of minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:PDC:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

Remarks N/A

:MODulation:UFSK

Supported All with Option 402

```
[:SOURce]:RADio:PDC:MODulation:UFSK "<file name>"
[:SOURce]:RADio:PDC:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 604 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation:UIQ

Supported All with Option 402

```
[:SOURce]:RADio:PDC:MODulation:UIQ "<file name>"
[:SOURce]:RADio:PDC:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry User I/Q

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 604 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|
FSK2|FSK4|FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM256|
UIQ|UFSK
[:SOURce]:RADio:PDC:MODulation[:TYPE]?
```

This command sets the modulation type for the PDC personality.

***RST** P4DQPSK

Choices BPSK QPSK IS95QPSK GRAYQPSK OQPSK IS95OQPSK π4DQPSK PSK8 PSK16 D8PSK MSK FSK2 FSK4 FSK8

FSK16 C4FM QAM4 QAM16 QAM32 QAM64 QAM256 UIQ UFSK

Key Entry **BPSK QPSK IS-95 QPSK Gray Coded QPSK OQPSK IS-95 OQPSK π/4 DQPSK 8PSK 16PSK D8PSK MSK 2-Lvl FSK 4-Lvl FSK 8-Lvl FSK 16-Lvl FSK C4FM 4QAM 16QAM 32QAM 64QAM 256QAM User I/Q User FSK**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:PDC:POLarity[:ALL]?
```

This command sets the rotation direction for of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Phase Polarity Normal Invert**

Remarks N/A

:SECondary:RECall

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

***RST** N/A

Range N/A

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 606.

A secondary frame is not active until the secondary state is enabled. To

activate a secondary frame, refer to ":SECondary[:STATe]" on page 607.

:SECondary:SAVE

Supported All with Option 402

`[:SOURce]:RADio:PDC:SECondary:SAVE`

This command saves the current frame configuration as the secondary frame with the filename `PDC_SECONDARY_FRAME`.

***RST** N/A

Range N/A

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to ":SECondary:SAVE" on page 606.

:SECondary:TRIGger[:SOURce]

Supported All with Option 402

`[:SOURce]:RADio:PDC:SECondary:TRIGger[:SOURce] KEY|EXT|BUS`
`[:SOURce]:RADio:PDC:SECondary:TRIGger[:SOURce]?`

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 620.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** N/A

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:SECondary[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:PDC:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Choices ON OFF 1 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary[:STATe]" on page 607.

:SLOT0|[1]|2|3|4|5:DCUStom

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DCUStom?
```

This command configures the data field for the selected downlink custom timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:DCUSTom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DCUStom:FIX4 <val>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

Remarks FIX4 must already be defined as the data type.

To change the data type, refer to ":SLOT0|[1]|2|3|4|5:DCUStom" on page 607.

:SLOT0|[1]|2|3|4|5:DTCHannel:CCODe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:CCODe <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:CCODe?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

***RST** #H00

Range #H00–#HFF

Key Entry CC

Remarks N/A

:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

***RST** #H00000

Range #H0–#HFFFFF

Key Entry SACCH

Remarks N/A

:SLOT0|[1]|2|3|4|5:DTCHannel:SWORd

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:SWORd <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel:SWORd?
```

This command sets the 20-bit synchronization word as the active function. This is used for the control and traffic physical channels.

***RST** #H87A4B

Range #H0–#HFFFFF

Key Entry **SW**

Remarks N/A

:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel] PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]?
```

This command configures the data field for the selected downlink traffic channel field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4 <val>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4:POWer

Supported All with Option 402

```
[:SOURce]:RADio:PDC:DLINk:SLOT0|[1]|2|3|4:POWer MAIN|DELTa
[:SOURce]:RADio:PDC:DLINk:SLOT0|[1]|2|3|4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:SLOT0|[1]|2|3|4|5:STATe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:STATe ON|OFF|1|0
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:STATe?
```

This command enables or disables the operating state of the selected timeslot.

***RST** *Timeslot 0*: 1 *Timeslots 1–5*: 0

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks N/A

:SLOT0|[1]|2|3|4|5:UCUStom

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UCUStom?
```

This command configures the data field for the selected uplink custom timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:UCUStom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UCUStom:FIX4 <val>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5:UTCHannel:CCODe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:CCODe <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:CCODe?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when

normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

***RST** #H00

Range #H00–#HFF

Key Entry CC

Remarks N/A

:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

***RST** #H0000

Range #H0–#H7FFF

Key Entry SACCH

Remarks N/A

:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd?
```

This command sets the 20-bit synchronization word as the active function. This is used for the control and traffic physical channels.

***RST** #H785B4

Range #H0–#HFFFFF

Key Entry SW

Remarks N/A

:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel] PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern type for the uplink traffic channel field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4 <val>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT0|[1]|2|3|4|5:UVOX:CCODe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:CCODe <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:CCODe?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

***RST** #H00

Range #H00–#HFF

Key Entry CC

Remarks N/A

:SLOT0|[1]|2|3|4|5:UVOX:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SACChannel <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

***RST** #H0000

Range #H0–#H7FFF

Key Entry SACCH

Remarks N/A

:SLOT0|[1]|2|3|4|5:UVOX:SWORd

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SWORd <bit_pattern>
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5:UVOX:SWORd?
```

This command changes the synchronization word, which is used for slot synchronization, equalizer training, and timeslot identification.

***RST** *UTCH & UVOX*: 785B4 *DTCH*: 87A4B

Range #H0–#HFFFFF

Key Entry SW

Remarks The *RST hexadecimal value reflects the value specified by the indicated standard.

:SLOT0|[1]|2|3|4|5[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5[:TYPE] UCUStom|DCUStom|
UTCH|UTCH_ALL|UVOX|DTCH|DTCH_ALL
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

***RST** UTCH

Choices UCUStom DCUStom UTCH UTCH_ALL UVOX DTCH DTCH_ALL

Key Entry **Up Custom** **Down Custom** **Up TCH** **UP TCH All** **Up VOX** **Down TCH** **Down TCH All**

Remarks N/A

:SOUT

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:PDC:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks N/A

:SOUT:OFFSet

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SOUT:OFFSet <val>
[:SOURce]:RADio:PDC:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number bits.

***RST** +0

Range –279 to 279

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 615.

:SOUT:SLOT

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SOUT:SLOT <val>
[:SOURce]:RADio:PDC:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit signal at the EVENT 1 rear panel connector.

***RST** +0

Range 0–5

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 615.

:SRATe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:SRATe <val>
[:SOURce]:RADio:PDC:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +2.10000000E+004

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 601, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well as the actual filter response (see ":BRATe" on page 589).

A change in the symbol rate value will affect the value of the bit rate; refer to ":BRATe" on page 589 for a list of minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 604.

:TRIGger:TYPE

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:PDC:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 619.
SINGle	The framed data sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:PDC:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE This choice immediately transmits a framed data sequence that is continuously repeated.

TRIGger This choice causes the framed data sequence to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated framed data sequence begins.

RESet This choice immediately restarts a continuously repeated framed data sequence upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 618.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:PDC:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select GATE as the ARB trigger type, refer to ":TRIGger:TYPE" on page 618.

:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:PDC:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 620.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** KEY

Choices KEY EXT BUS

Key Entry **Trigger Key Ext Bus**

Remarks N/A

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|
EPT2|EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 620.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the number of delay bits for the external trigger delay.

The variable <val> is expressed in bits.

***RST** +0

Range 0–1048576

Key Entry **Ext Delay Bits**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 620.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 620.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 402

```
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity of the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 620.

[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PDC[:STATe] ON|OFF|1|0 [:SOURce]:RADio:PDC[:STATe]?
```

This command enables or disables the PDC modulation format.

***RST** OFF

Choices ON OFF 1 0

Key Entry **PDC Off On**

Remarks Although the PDC modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

PHS Subsystem–Option 402 ([:SOURce]:RADio:PHS)

:ALPha

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ALPHa <val>
[:SOURce]:RADio:PHS:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 642.

:BBCLock

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:PHS:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Choices INT[1] EXT[1]

Key Entry **BBG Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BBT <val>
[:SOURce]:RADio:PHS:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 642.

:BRATe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BRATe <val>
[:SOURce]:RADio:PHS:BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +3.84000000E+005

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Mbps	1–50 Mbps
FSK2			
MSK			
C4FM	2	2–100 Mbps	2–50 Mbps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
QPSK	2	2–100 Mbps	2–50 Mbps
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 642, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see ":SRATe" on page 649).

A change in the bit rate value will affect the symbol rate value; refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645.

:BURSt:PN9

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:PN9 NORMal|QUICk
[:SOURce]:RADio:PHS:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Choices NORMal QUICk

Key Entry **PN9 Mode Normal Quick**

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SCRamble:SEED

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SCRamble:SEED <16-bit val>
[:SOURce]:RADio:PHS:BURSt:SCRamble:SEED?
```

This command select a 16-bit scramble seed value for scrambling.

***RST** #H3FF

Range #H0–#H3FF

Key Entry **Scramble Seed**

Remarks Although values may be set using this command, it does not active that scramble function.

To enable the scrambling function, refer to ":BURSt:SCRamble[:STATe]" on page 626.

:BURSt:SCRamble[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SCRamble[:STATe] ON|OFF|1|0
[:SOURce]:RADio:PHS:BURSt:SCRamble[:STATe]?
```

This command enables or disables the operating state of the scramble function.

ON (1) This choice scrambles data on the related fields, using the seed setting.

OFF (0) This choice disables the scramble function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Scramble Off On**

Remarks To set the seed setting, refer to ":BURSt:SCRamble:SEED" on page 626.

:BURSt:SHAPe:FALL:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –22.1250 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 628 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FALL:TIME

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–255.8750

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 628 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FDELay

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:FDELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –22.1250 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 627 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FTIMe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:FTIMe?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–255.8750

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 627 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RDELay

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:RDELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –18.1250 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 630 performs the same

function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –18.1250 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 629 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–22.500

Key Entry **Rise Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 631 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RTIMe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:PHS:BURSt:SHAPe:RTIMe?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits.

***RST** +4.00000000E+001

Range 0.1250–22.500

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645. Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 630 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:PHS:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined

file ("<file name>").

SINE	This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.
"<file name>"	This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks N/A

:BURSt[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:PHS:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1)	This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots. If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.
OFF (0)	This choice enables the transmission of unframed data.

***RST** 0

Choices ON OFF 1 0

Key Entry **Data Format Pattern Framed**

Remarks N/A

:CHANnel

Supported All with Option 402

```
[:SOURce]:RADio:PHS:CHANnel EVM|ACP
[:SOURce]:RADio:PHS:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 642.

:DATA

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DATA PN9|PN11|PN15|PN20|PN23|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PHS:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST** PN23

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DATA:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DATA:FIX4 <val>
[:SOURce]:RADio:PHS:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the protocols (modulation type, symbol rate, filter, and burst shape) selected for the PHS format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:DEFault

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DEFault
```

This command returns all of the PHS modulation format parameters to factory settings. It does not affect any other signal generator parameters.

***RST** N/A

Range N/A

Key Entry **Restore PHS Factory Default**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:CUSTom

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:CUSTom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:CUSTom?
```

This command configures the data field for the selected downlink custom timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT**
4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's
64 1's & 64 0's

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DLINk:SLOT[1]|2|3|4:CUSTom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:CUSTom:FIX4 <val>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:DLINK:SLOT[1]|2|3|4:POWer

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:POWer MAIN|DELTa
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:SCHannel:CSID

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:CSID <bit_pattern>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:CSID?
```

This command changes the 42-bit cell station identification code (CSID) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for CSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H20200020001

Range #H0–#H3FFFFFFFFF

Key Entry **CSID**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:SCHannel:IDLE

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:IDLE <bit_pattern>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:IDLE?
```

This command changes the 34-bit idle (IDLE) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for IDLE reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H000000000

Range #H0–#H3FFFFFFFF

Key Entry **IDLE**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:SCHannel:PSID

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:PSID <bit_pattern>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:PSID?
```

This command changes the 28-bit personal station identification code (PSID) field in the synchronization channel of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for PSID reflects the PHS protocol, however you

can enter a new value with this command.

***RST** #H0000001

Range #H0–#H3FFFFFFFF

Key Entry **PSID**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:SCHannel:UWORd

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:UWORd <bit_pattern>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:SCHannel:UWORd?
```

This command changes the unique word (UW) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H50EF2993

Range #H0–#HFFFFFFFF

Key Entry **UW**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:STATe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:STATe ON|OFF|1|0
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:STATe?
```

This command enables or disables the operating state of the selected downlink timeslot.

***RST** *Timeslot 1*: 1 *Timeslots 2–4*: 0

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks N/A

:DLINk:SLOT[1]|2|3|4:TCHannel:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel:SACChannel
<bit_pattern>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

***RST** #H8000

Range #H0–#HFFFF

Key Entry SA

Remarks N/A

:DLINk:SLOT[1]|2|3|4:TCHannel:UWORd

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel:UWORd <bit_pattern>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel:UWORd?
```

This command changes the unique word (UW) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H3D4C

Range #H0–#HFFFF

Key Entry UW

Remarks N/A

:DLINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel
[:TCHannel] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|
P64
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]?
```

This command customizes the selected downlink traffic channel timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DLINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]:FIX4 <val>
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. To change the data type, refer to ":DLINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]" on page 638.

:DLINk:SLOT[1]|2|3|4[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4[:TYPE] CUSTom|TCH|TCH_ALL|SYNC
[:SOURce]:RADio:PHS:DLINk:SLOT[1]|2|3|4[:TYPE]?
```

This command sets the downlink timeslot type for the selected timeslot.

***RST** *Timeslot 1*: TCH *Timeslots 1–4*: CUSTom

Choices CUSTom TCH TCH_ALL SYNC

Key Entry **Custom TCH TCH All SYNC**

Remarks N/A

:EDATa:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PHS:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** N/A

Range N/A

Key Entry N/A

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported All with Option 402

```
[:SOURce]:RADio:PHS:EDCLock SYMBol|NORMal
[:SOURce]:RADio:PHS:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Choices SYMBol NORMal

Key Entry Ext Data Clock Normal Symbol

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 623 to select EXT as the data clock type.

:EREFerence

Supported All with Option 402

```
[:SOURce]:RADio:PHS:EREFerence INT|EXT
[:SOURce]:RADio:PHS:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Choices INT EXT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 641 to enter the external reference frequency setting.

:EREFerence:VALue

Supported All with Option 402

```
[:SOURce]:RADio:PHS:EREFerence:VALue <val>
[:SOURce]:RADio:PHS:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 641 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported All with Option 402

```
[:SOURce]:RADio:PHS:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:PHS:FILTer?
```

This command selects the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<User FIR>"	This variable is any filter file that you have stored into memory.

***RST** RNYQ

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:IQ:SCALe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:IQ:SCALe <val>
[:SOURce]:RADio:PHS:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +100

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:PHS:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 645.

Refer to ":SRATe" on page 649 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:PHS:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

Remarks N/A

:MODulation:UFSK

Supported All with Option 402

```
[:SOURce]:RADio:PHS:MODulation:UFSK "<file name>"
[:SOURce]:RADio:PHS:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 645 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation:UIQ

Supported All with Option 402

```
[:SOURce]:RADio:PHS:MODulation:UIQ "<file name>"
[:SOURce]:RADio:PHS:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 645 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|
FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM256|UIQ|UFSK
[:SOURce]:RADio:PHS:MODulation[:TYPE]?
```

This command sets the modulation type for the PHS personality.

***RST** P4DQPSK

Choices BPSK QPSK IS95QPSK GRAYQPSK OQPSK IS95OQPSK π4DQPSK PSK8 PSK16 D8PSK MSK FSK2 FSK4 FSK8 FSK16 C4FM QAM4 QAM16 QAM32 QAM64 QAM256 UIQ UFSK

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **256QAM** **User I/Q** **User FSK**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:PHS:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Phase Polarity Normal Invert**

Remarks N/A

:SECondary:RECall

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

***RST** N/A

Range N/A

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 646.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 647.

:SECondary:SAVE

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SECondary:SAVE
```

This command saves the current frame configuration as the secondary frame with the filename PHS_SECONDARY_FRAME.

***RST** N/A

Range N/A

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to ":SECondary:RECall" on page 646.

:SECondary:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SECondary:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:PHS:SECondary:TRIGger[:SOURce]?
```

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 653.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** N/A

Choices KEY EXT BUS

Key Entry **Trigger Key Ext Bus**

Remarks N/A

:SECondary[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:PHS:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Choices ON OFF 1 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 646.

:SOUT

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:PHS:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks N/A

:SOUT:OFFSet

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SOUT:OFFSet <val>
[:SOURce]:RADio:PHS:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range –239 to 239

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 648.

:SOUT:SLOT

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SOUT:SLOT <val>
[:SOURce]:RADio:PHS:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +0

Range 1–4

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 648.

:SRATe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:SRATe <val>
[:SOURce]:RADio:PHS:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +1.92000000E+005

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry **Symbol Rate**

Remarks

When user-defined filters are selected using the command in section ":FILTer" on page 642, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well as the actual filter response (see ":BRATe" on page 624).

A change in the symbol rate value will affect the bit rate value; refer to ":BRATe" on page 624 for a list of the minimum and maximum symbol

rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 645.

:TRIGger:TYPE

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:PHS:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 651.
SINGle	The framed data sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:PHS:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE	This choice immediately transmits a framed data sequence that is continuously repeated.
TRIGger	This choice causes the framed data sequence to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated framed data sequence begins.
RESet	This choice immediately restarts a continuously repeated framed data

sequence upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 651.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:PHS:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select GATE as the ARB trigger type, refer to ":TRIGger:TYPE" on page 651.

:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:PHS:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the

rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 653.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** KEY

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|
EPT2|EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 652.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the number of delay bits for the external trigger delay.

The variable <val> is expressed in bits.

***RST** +0

Range 0–1048576

Key Entry **Ext Delay Bits**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 652.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 652.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:PHS:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity of the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 652.

:ULINk:SLOT[1]|2|3|4:CUSTom

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:CUSTom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:CUSTom?
```

This command configures the data field for the selected uplink custom timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:ULINk:SLOT[1]|2|3|4:CUSTom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:CUSTom:FIX4 <val>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:ULINK:SLOT[1]|2|3|4:POWer

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:POWer MAIN|DELTa
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:SCHannel:CSID

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:CSID <bit_pattern>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:CSID?
```

This command changes the 42-bit cell station identification code (CSID) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for CSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H20200020001

Range #H0–#H3FFFFFFFFF

Key Entry **CSID**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:SCHannel:IDLE

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:IDLE <bit_pattern>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:IDLE?
```

This command changes the 34-bit idle (IDLE) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for IDLE reflects the PHS

protocol, however you can enter a new value with this command.

***RST** #H000000000

Range #H0–#H3FFFFFFFF

Key Entry **IDLE**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:SCHannel:PSID

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:PSID <bit_pattern>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:PSID?
```

This command changes the 28-bit personal station identification code (PSID) field in the synchronization channel of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for PSID reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H0000001

Range #H0–#H3FFFFFFFF

Key Entry **PSID**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:SCHannel:UWORd

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:UWORd <bit_pattern>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:SCHannel:UWORd?
```

This command changes the unique word (UW) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H050EF2993

Range #H0–#H0FFFFFFFF

Key Entry **UW**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:STATe

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:STATe ON|OFF|1|0
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:STATe?
```

This command enables or disables the operating state of the selected uplink timeslot.

***RST** *Timeslot 1*: 1 *Timeslots 2–4*: 0

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:TCHannel:SACChannel

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel:SACChannel
<bit_pattern>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

***RST** #H8000

Range #H0–#HFFFF

Key Entry **SA**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:TCHannel:UWORd

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel:UWORd <bit_pattern>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel:UWORd?
```

This command changes the unique word (UW) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

***RST** #H3D4C

Range #H0–#HFFFF

Key Entry **UW**

Remarks N/A

:ULINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel
[:TCHannel] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|
P64
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]?
```

This command selects the data pattern for the selected uplink traffic channel timeslot.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **EXT** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:ULINk:SLOT[1]|2|3|4:TCHannel[:TCHannel:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]:FIX4 <val>
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4:TCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:ULINk:SLOT[1]|2|3|4[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4[:TYPE] CUSTom|TCH|TCH_ALL|SYNC
[:SOURce]:RADio:PHS:ULINk:SLOT[1]|2|3|4[:TYPE]?
```

This command sets the uplink timeslot type for the selected uplink timeslot.

***RST** *Timeslot 1*: TCH *Timeslots 2–4*: CUSTom

Choices CUSTom TCH TCH_ALL SYNC

Key Entry **Timeslot Type**

Remarks N/A

[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:PHS[:STATe] ON|OFF|1|0
[:SOURce]:RADio:PHS[:STATe]?
```

This command enables or disables the PHS modulation format.

***RST** 0

Choices ON OFF 1 0

Key Entry **PHS Off On**

Remarks Although the PHS modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

Sense Subsystem–Options UN7 and 300 ([:SOURce]:SENSe:BERT)

:BTS:LOOPback:EDGE:ETCH:F43:BLOCk:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:ETCH:F43:CONTain

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:CONTain?
```

This command enables or disables the BER measurement for ETCH/F43 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the measurement.

***RST** 1

Choices ON OFF 1 0

Key Entry **BER Mode Off On**

Remarks N/A

:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

Remarks N/A

:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SELect] EBLock|
NONE
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBLock NONE

Key Entry **Block Erasure** **No Thresholds**

Remarks N/A

:BTS:LOOPback:EDGE:FTRigger:DELay

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:DELay <val>
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:DELay?
```

This command specifies the delay time of the frame trigger.

The variable <val> is expressed in symbols with a resolution of 0.25.

***RST** +0.00000000E+000

Range –1250 to 1250

Key Entry N/A

Remarks N/A

:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELay

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELay <val>
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELay?
```

This command specifies the delay time of the external frame trigger. This delay is the offset from the beginning of timeslot 0.

The variable <val> is expressed in symbols with a resolution of 0.25.

***RST** +0.00000000E+000

Range –1250 to 1250

Key Entry **Ext Frame Trigger Delay**

Remarks Refer to the *User's Guide* for information on how to calculate the delay value.

:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity POSitive|
NEGative
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity?
```

This command specifies the external frame trigger polarity.

POS This selects the reference edge to be the rising edge of the pulse.

NEG This selects the reference edge to be the falling edge of the pulse.

***RST** POS

Choices POSitive NEGative

Key Entry **External Frame Trigger Polarity Neg Pos**

Remarks N/A

:BTS:LOOPback:EDGE:FTRigger[SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger[:SELect] INTernal|EXTernal
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger[:SELect]?
```

This command specifies the frame trigger source to be used by the baseband generator.

INTernal This choice enables internal triggering.

EXTernal This choice enables the triggering by an externally applied signal at the rear panel connector.

***RST** INT

Choices INTernal EXTernal

Key Entry **Frame Trigger Source Int Ext**

Remarks To enable this command, the frame trigger synchronization source must be PDCH. Refer to ":BTS:LOOPback:EDGE:SYNC[:SOURce]" on page 676.

:BTS:LOOPback:EDGE:MCS5:BLOCk:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:BLOCk:COUNt <value>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:CONTain

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:CONTain?
```

This command enables or disables the BER measurement for MCS-5 channels in addition to the BLER measurement.

ON	With this choice, data bits of the specified number of blocks are measured.
OFF	This choice disables the measurement.

***RST** 1

Choices ON OFF 1 0

Key Entry **BER Mode Off On**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:ESENsitivity

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:ESENsitivity?
```

This command specifies the target error rate when performing a sensitivity search.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E–001

Range 1E–6 to 1

Key Entry **Target BER %**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:HAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search. The high amplitude value can not be lower than the low amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –9.00000000E+001

Range –136 to 20

Key Entry **High Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:LAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search. The low amplitude value can not be higher than the high amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –1.10000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:PAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –1.01000000E+002

Range –136.0 to 20

Key Entry **Pass Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt?
```

This command specifies the total number of blocks for each measurement during the sensitivity search.

***RST** +1200

Range 1–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:SBLock:INITial

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:INITial <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:INITial?
```

This command specifies the total number of blocks to be measured at the beginning of each measurement during the sensitivity search.

***RST** +600

Range 1–1500000

Key Entry **Initial Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock <value>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

Remarks N/A

:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to

prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock — This choice enables you to specify the number of erased blocks or bit errors.

NONE — This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBLock NONE

Key Entry **Block Erasure** **No Thresholds**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:BLOCk:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

Only even values can be entered. If odd numbers are entered, the value increments by one to make it an even value.

***RST** +600

Range 2–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:CONTain

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:CONTain?
```

This command enables or disables the BER measurement for MCS-9 channels in addition to the BLER measurement.

ON — With this choice, data bits of the specified number of blocks are measured.

OFF — This choice disables the measurement.

***RST** 1

Choices ON OFF 1 0

Key Entry **BER Mode Off On**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:ESENsitivity

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:ESENsitivity?
```

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 1E–6 to 1

Key Entry **Target BER %**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:HAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search. The high amplitude value can not be lower than the low amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –8.00000000E+001

Range –136.0 to 20

Key Entry **High Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:LAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search. The low amplitude value can not be higher than the high amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –1.00000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:PAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –9.15000000E+001

Range –136.0 to 20

Key Entry **Pass Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:SBLock:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:COUNt?
```

This command specifies the total number of blocks to be measured at each measurement during the sensitivity search.

Only even values can be entered. If odd numbers are entered, the value increments by

one to make it an even value.

***RST** +1200

Range 2–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:SBLock:INITial

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:INITial <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:INITial?
```

This command specifies the total number of blocks to be measured at the beginning of each measurement during the sensitivity search.

Only even values can be entered. If odd numbers are entered, the value increments by one to make it an even value.

***RST** +600

Range 2–1500000

Key Entry **Initial Block Count**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

Remarks N/A

:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock — This choice enables you to specify the number of non-erased blocks that contain bit errors.

NONE — This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBLock NONE

Key Entry **Block Erasure** **No Thresholds**

Remarks N/A

:BTS:LOOPback:EDGE:MEASurement:STOP

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement:STOP
```

This command immediately stops any current measurement and releases the PRBS synchronization. After the synchronization is released, a new PRBS synchronization is attempted.

***RST** N/A

Range N/A

Key Entry **Stop Measurement**

Remarks N/A

:BTS:LOOPback:EDGE:MEASurement:TSLot

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement:TSLot 0|1|2|3|4|5|6|7
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement:TSLot?
```

This command specifies the timeslot number in which the measurement is to be

performed.

The following EDGE timeslot configuration conditions will generate error message "-221 Settings Conflict":

- If the specified timeslot does not have one of the BLER/BER measurable channel types, which are uncoded, E-TCH/43.2NT, MCS-9, and MCS-5.
- If the specified timeslot type is not set to "NORMal."

***RST** +0

Choices 0 1 2 3 4 5 6 7

Key Entry **Timeslot**

Remarks This command couples the selected timeslot number with the EDGE configuration.

Changing the timeslot configuration with EDGE on will not generate an error message if EDGE BERT is off and the timeslot is off.

:BTS:LOOPback:EDGE:MEASurement[:MODE]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement[:MODE] BLER|SSEarch
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement[:MODE]?
```

This command specifies the measurement mode.

BLER This choice specifies BLER% as the measurement mode.

SSEarch This choice specifies sensitivity search as the measurement mode.

***RST** BLER

Choices BLER SSEarch

Key Entry **Measurement Mode BLER% Search**

Remarks If the BLER% measurement is already running, this command will abort the BLER% measurement.

:BTS:LOOPback:EDGE:SINVert

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SINVert ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:SINVert?
```

This command sets the operating state of the spectrum inverting function.

ON This choice specifies that the EDGE demodulator invert the spectrum of the received RF signal.

OFF This choice leaves the spectrum of the received RF signal unaffected.

***RST** 1

Choices ON OFF 1 0

Key Entry **Spectrum Invert Off On**

Remarks N/A

:BTS:LOOPback:EDGE:SYNC:AGAin

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC:AGAin
```

This command adjusts the input signal level of the internal demodulator. Use this adjustment when switching from BCH synchronization to PDCH synchronization.

***RST** N/A

Range N/A

Key Entry **Adjust Gain**

Remarks This command is ignored unless the status displays ”Waiting for PDCH.”

:BTS:LOOPback:EDGE:SYNC:RF

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC:RF
```

This command releases the current synchronization with the BTS and immediately starts to try to synchronize to either a BCH or PDCH signal as selected with the

SYNC[:SOURce] command. This command will also stop the current measurement.

***RST** N/A

Range N/A

Key Entry **Synchronize to BCH/PDCH**

Remarks N/A

:BTS:LOOPback:EDGE:SYNC[:SOURce]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC[:SOURce] BCH|PDCH
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC[:SOURce]?
```

This command specifies the synchronization source from the BTS under test.

BCH This choice specifies the traffic channel as the synchronization source.

PDCH This choice specifies the packet data channel as the synchronization source.

***RST** BCH

Choices BCH PDCH

Key Entry **Sync Source BCH PDCH**

Remarks N/A

:BTS:LOOPback:EDGE:TRIGger[:SOURce]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:TRIGger[:SOURce] IMMediate|KEY|EXT|BUS
:SENSe:BERT:BTS:LOOPback:EDGE:TRIGger[:SOURce]?
```

This command determines the trigger source for the EDGE loopback bit error rate measurement.

IMMediate This choice begins the measurement directly after synchronization has been achieved.

KEY This choice begins the measurement when the front panel **Trigger** key is pressed, provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.

EXT This choice begins the measurement as soon as a trigger signal is applied to the rear panel connector provided that synchronization has

been achieved. If synchronization has not occurred, the trigger is ignored.

BUS — This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

***RST** KEY

Choices IMMediate KEY EXT BUS

Key Entry **Immediate** **Trigger Key** **Ext** **Bus**

Remarks An inherent variable delay will always exist when starting a measurement because the measurement must await the start of the next speech frame after the trigger. The delay can vary between 0 and 23 ms (5 frames) depending on where the trigger falls within the TDMA multiframe.

A trigger is ignored unless the EDGE loopback operating state is turned on.

:BTS:LOOPback:EDGE:ULINk:OFFSet

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ULINk:OFFSet <val>
:SENSe:BERT:BTS:LOOPback:EDGE:ULINk:OFFSet?
```

This command specifies, in symbols, the amount of compensation for the insertion of equipment such as fading simulators into the uplink RF path.

***RST** +0

Range –500 to 10000

Key Entry **Uplink Timing Advance**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:BIT:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:BIT:COUNt <value>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:BIT:COUNt?
```

This command specifies the total number of bits to be measured for the uncoded channel.

***RST** +139200

Range 1392–2147483647

Key Entry **Bit Count**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:ESENsitivity

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:ESENsitivity?
```

This command specifies the target error rate when performing a sensitivity search.

***RST** +2.00000000E-002

Range 1E–6 to 1

Key Entry **Target BER %**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:HAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search. The high amplitude value can not be lower than the low amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –8.50000000E+001

Range –136.0 to 20

Key Entry **High Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:LAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search. The low amplitude value can not be higher than the high amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –1.05000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:PAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –9.50000000E+001

Range –136.0 to 20

Key Entry **Pass Amplitude**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNt?
```

This command specifies the total number of bits to be measured during a sensitivity search for the uncoded channel.

***RST** +139200

Range 1392–2147483647

Key Entry **Bit Count**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial?
```

This command specifies the total number of bits to be measured at the beginning of the sensitivity search for the uncoded channel.

***RST** +13920

Range 1392–2147483647

Key Entry **Initial Bit Count**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT?
```

This command specifies the number of block erasures or bit errors, depending on the measurement channel type, for the threshold limit to stop the measurement.

***RST** +2784

Range 0–2147483647

Key Entry **Error Count**

Remarks N/A

:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SELect] EBIT|NONE
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to

prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBIT This choice enables you to specify the number of bit errors.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBIT NONE

Key Entry **Error Count** **No Thresholds**

Remarks N/A

:BTS:LOOPback:EDGE[:STATe]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE[:STATe] ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE[:STATe]?
```

This command sets the operating state of the EDGE loopback bit error rate (BER) function.

ON This choice enables the EDGE loopback BER function.

OFF This choice disables the EDGE loopback BER function.

***RST** 0

Choices ON OFF 1 0

Key Entry **EDGE BERT Off On**

Remarks Although you can configure the measurement parameters while the operating state is off, any command triggers sent will be ignored until the operating state is turned on.

:BTS:LOOPback:GSM:CS1:BLOCk:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:CS1:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:GSM:CS1:CONTain

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:CS1:CONTain?
```

This command enables or disables the BER measurement for CS-1 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the BER measurement.

***RST** 1

Choices ON OFF 1 0

Key Entry **BER Mode Off On**

Remarks N/A

:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

Remarks N/A

:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBLock NONE

Key Entry **Block Erasure** **No Thresholds**

Remarks N/A

:BTS:LOOPback:GSM:CS4:BLOCk:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:BLOCk:COUNt <value>
:SENSe:BERT:BTS:LOOPback:GSM:CS4:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1 to 1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:GSM:CS4:CONTain

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:CS4:CONTain?
```

This command enables or disables the BER measurement for CS-4 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are

measured.

OFF — This choice disables the BER measurement.

***RST** 1

Choices ON OFF 1 0

Key Entry **BER Mode Off On**

Remarks N/A

:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock?
```

This command specifies the threshold limit to stop the measurement which is the number of erased blocks that contain bit errors.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

Remarks N/A

:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock — This choice enables you to specify the number of erased blocks.

NONE — This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBLock NONE

Key Entry **Block Erasure** **No Thresholds**

Remarks N/A

:BTS:LOOPback:GSM:ESENsitivity

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:GSM:ESENsitivity?
```

This command specifies the target error rate when performing a sensitivity search.

***RST** +2.00000000E-002

Range 1E–6 to 1

Key Entry **Target BER%**

Remarks N/A

:BTS:LOOPback:GSM:FRAMe:CIB

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:CIB?
```

This query returns the total number of Class Ib bits to be measured which are calculated from the total number of frames specified to be measured.

***RST** N/A

Range N/A

Key Entry N/A

Remarks N/A

:BTS:LOOPback:GSM:FRAMe:CII

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:CII?
```

This query returns the total number of Class II bits to be measured which are calculated from the total number of frames specified to be measured.

***RST** N/A

Range N/A

Key Entry N/A

Remarks N/A

:BTS:LOOPback:GSM:FRAMe:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:COUNt?
```

This command determines the length of the measurement specified by the total number of frames included in one measurement.

***RST** +100

Range 1–6000000

Key Entry **Frame Count**

Remarks N/A

:BTS:LOOPback:GSM:HAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:GSM:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –9.00000000E+001

Range –136.0 to 20

Key Entry **High Amplitude**

Remarks N/A

:BTS:LOOPback:GSM:LAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:GSM:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –1.15000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

Remarks N/A

:BTS:LOOPback:GSM:MCS1:BLOCk:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

Remarks N/A

:BTS:LOOPback:GSM:MCS1:CONTain

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:CONTain?
```

This command enables or disables the BER measurement for MCS-1 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the BER measurement.

***RST** 1

Choices ON OFF 1 0

Key Entry **BER Mode Off On**

Remarks N/A

:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

Remarks N/A

:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBLock NONE

Key Entry **Block Erasure** **No Thresholds**

Remarks N/A

:BTS:LOOPback:GSM:MEASurement:STOP

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement:STOP
```

This command stops any current measurement and releases the current PRBS synchronization. After the synchronization is released, a new PRBS synchronization is attempted.

***RST** N/A

Range N/A

Key Entry **Stop Measurement**

Remarks N/A

:BTS:LOOPback:GSM:MEASurement:TSLot

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement:TSLot 0|1|2|3|4|5|6|7
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement:TSLot?
```

This command specifies the timeslot number in which the measurement is to be performed. This command couples the selected timeslot number with the GSM configuration.

The following GSM timeslot configuration conditions will generate error message "-221 Settings Conflict":

- If the specified timeslot E field fails to designate either MPN9 or MPN15.
- If the specified timeslot is not set to "Normal."

***RST** +0

Choices 0 1 2 3 4 5 6 7

Key Entry **Timeslot**

Remarks Changing the timeslot configuration with GSM on will not generate error messages if GSM BERT is off and the timeslot is off.

:BTS:LOOPback:GSM:MEASurement[:MODE]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement[:MODE] BER|SSEarch
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement[:MODE]?
```

This command specifies the measurement mode.

BER This choice specifies BER% as the measurement mode.

SSEarch This choice specifies sensitivity search as the measurement mode.

***RST** BER

Choices BER SSEarch

Key Entry **Measurement Mode BER% Search**

Remarks If the BER% measurement is already running, this command will abort the BER% measurement.

:BTS:LOOPback:GSM:PAMPlitude

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:GSM:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –1.04000000E+002

Range –136.0 to 20

Key Entry **Pass Amplitude**

Remarks N/A

:BTS:LOOPback:GSM:SFRame:COUNt

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:COUNt?
```

This command specifies the total number of frames to be measured for the final measurements during the sensitivity search.

***RST** +100

Range 1–6000000

Key Entry **Frame Count**

Remarks N/A

:BTS:LOOPback:GSM:SFRame:INITial

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:INITial <val>
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:INITial?
```

This command specifies the number of frames to be measured while sensitivity search is running rough searching to gain search speed. It is the first phase of sensitivity search.

***RST** +26

Range 1–6000000

Key Entry **Initial Frame Count**

Remarks N/A

:BTS:LOOPback:GSM:SINVert

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SINVert ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:SINVert?
```

This command sets the operating state of the spectrum inverting function.

ON This choice specifies that the GSM demodulator invert the spectrum of the received RF signal.

OFF This choice leaves the spectrum of the received RF signal unaffected.

***RST** 1

Choices ON OFF 1 0

Key Entry **Spectrum Invert Off On**

Remarks N/A

:BTS:LOOPback:GSM:STOP:CRITeria:CIB

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CIB <val>
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CIB?
```

This command specifies the threshold number of Class Ib errors to stop the measurement.

***RST** 300

Range 0–1000000

Key Entry **Class Ib Bit Error**

Remarks Refer to ":BTS:LOOPback:GSM:STOP:CRITeria[:SELect]" on page 692 for information on the use of the file variables.

:BTS:LOOPback:GSM:STOP:CRITeria:CII

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CII <val>
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CII?
```

This command specifies the threshold number of Class II errors to stop the measurement.

***RST** 300

Range 0–1000000

Key Entry **Class II Bit Error**

Remarks Refer to ":BTS:LOOPback:GSM:STOP:CRITeria[:SELect]" on page 692 for information on the use of the file variables.

:BTS:LOOPback:GSM:STOP:CRITeria:FERasure

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:FERasure <val>
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:FERasure?
```

This command specifies the threshold number of erased frames to stop the measurement.

***RST** 120

Range 0–1000000

Key Entry **Frame Erasure**

Remarks Refer to ":BTS:LOOPback:GSM:STOP:CRITeria[:SELect]" for information on the use of the file variables.

:BTS:LOOPback:GSM:STOP:CRITeria[:SELect]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria[:SELect] FERasure|CIB|CII|
ANY|NONE
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria[:SELect]?
```

This command sets the threshold criteria used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no

later than 200 ms after the threshold is exceeded.

FERasure	This selection ends the measurement when the number of erased frames exceeds the specified threshold.
CIB	This selection ends the measurement when the number of Class Ib errors detected exceeds the specified threshold.
CII	This selection ends the measurement when the number of Class II errors detected exceeds the specified threshold.
ANY	This selection ends the measurement when any of the above stop measurement threshold criteria is exceeded.
NONE	This selection disables the stop measurement threshold criteria function, so that the measurement runs for the specified number of speech frames.

***RST** NONE

Choices FERasure CIB CII ANY NONE

Key Entry **Frame Erasure** **Class Ib Bit Error** **Class II Bit Error** **Exceeds Any Thresholds** **No Thresholds**

Remarks N/A

:BTS:LOOPback:GSM:SYNC:RF

Supported All with Option 300

`:SENSe:BERT:BTS:LOOPback:GSM:SYNC:RF`

This command releases the current synchronization with the BTS and immediately starts to try to synchronize to either a BCH or TCH signal as selected with the `SYNC[:SOURce]` command. This command will also stop the current measurement.

***RST** N/A

Range N/A

Key Entry **Synchronize to BCH/TCH**

Remarks The test equipment can use a BCH signal from the BTS to determine the required transmit timeslot, frame and multiframe timing. The BCH signal is always transmitted in timeslot 0 and contains multiframe information. Use BCH when a BCH subset is present

which contains SCH bursts with a properly coded T2 parameter.

Use TCH when providing a TCH/FS training sequence from the BTS. However, only one timeslot from the BTS can be active at a time and you must specify to the receiver which timeslot is being received since it has no absolute reference (unlike a BCH signal, which is always transmitted in timeslot 0).

:BTS:LOOPback:GSM:SYNC[:SOURce]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SYNC[:SOURce] BCH|TCH
:SENSe:BERT:BTS:LOOPback:GSM:SYNC[:SOURce]?
```

This command specifies the synchronization source from the BTS under test.

BCH — This choice specifies the broadcast channel as the synchronization source.

TCH — This choice specifies the traffic channel as the synchronization source.

***RST** BCH

Choices BCH TCH

Key Entry **Sync Source BCH TCH**

Remarks N/A

:BTS:LOOPback:GSM:TRIGger[:SOURce]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:TRIGger[:SOURce] IMMediate|KEY|EXT|BUS
:SENSe:BERT:BTS:LOOPback:GSM:TRIGger[:SOURce]?
```

This command determines the trigger source for the GSM loopback bit error rate measurement.

IMMediate — This choice begins the measurement directly after synchronization has been achieved.

KEY — This choice begins the measurement when the front panel **Trigger** key is pressed, provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.

EXT — This choice begins the measurement as soon as a trigger signal is applied to the rear panel connector provided that synchronization has

been achieved. If synchronization has not occurred, the trigger is ignored.

BUS — This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

***RST** KEY

Choices IMMediate KEY EXT BUS AUX

Key Entry **Immediate** **Trigger Key** **Ext** **Bus** **Aux**

Remarks An inherent variable delay will always exist when starting a measurement because the measurement must await the start of the next speech frame after the trigger. The delay can vary between 0 and 23 ms (5 frames) depending on where the trigger falls within the TDMA multiframe.

A trigger is ignored unless the GSM loopback operating state is turned on.

:BTS:LOOPback:GSM:ULINk:OFFSet

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:ULINk:OFFSet <value>
:SENSe:BERT:BTS:LOOPback:GSM:ULINk:OFFSet?
```

This command specifies the amount of compensation for the insertion of equipment such as fading simulators into the uplink RF path.

***RST** +0

Range –500 to 10000

Key Entry **Uplink Timing Advance**

Remarks N/A

:BTS:LOOPback:GSM[:STATe]

Supported All with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM[:STATe] ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM[:STATe]?
```

This command turns on and off the operating state of the GSM loopback bit error rate function. Although you can configure the measurement parameters while the operating state is off, any command triggers sent will be ignored until the operating state is turned

on.

***RST** 0

Choices ON OFF 1 0

Key Entry **GSM BERT Off On**

Remarks N/A

[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA ALL_0|ALL_1
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA?
```

This command selects the bit parameter of the special pattern ignore function.

ALL_0 This choice ignores more than 80 bits of 0's when they are detected.

ALL_1 This choice ignores more than 80 bits of 1's when they are detected.

***RST** ALL_0

Choices ALL_0 ALL_1

Key Entry **Spcl Pattern 0's 1's**

Remarks This command is valid only when the special pattern ignore function is on. Refer to "[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe]" on page 696.

[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe]

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe] ON|OFF|1|0
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe]?
```

This command enables or disables the special pattern ignore function.

ON This choice detects more than 80 bits of 0's or 1's in the incoming bit stream and ignores these bits when making BER measurements. To select 0's or 1's refer to "[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA" on page 696

OFF This choice disables the detect mode for the BER measurement.

***RST** OFF

Choices ON OFF 1 0

Key Entry **Spcl Pattern Ignore Off On**

Remarks N/A

[:BASeband]:PRBS[:DATA]

Supported All with Option 300

```
:SENSe:BERT[:BASeband]:PRBS[:DATA] PN9|PN11|PN15|PN20|PN23
:SENSe:BERT[:BASeband]:PRBS[:DATA]?
```

This command selects the incoming data pattern for making BER measurements.

PN9–PN23 These choices select an internally generated pseudo-random pattern for BER measurements.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23

Key Entry **PN9 PN11 PN15 PN20 PN23**

Remarks N/A

[:BASeband]:RSYNc:THReshold

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:RSYNc:THReshold <val>
:SENSe:BERT[:BASeband]:RSYNc:THReshold?
```

This command specifies the threshold level for the resynchronizing function.

***RST** 0.40

Range 0.05–0.40

Key Entry **Resync Limits**

Remarks This command is valid only when the BERT resynchronizing function is on. Refer to "[:BASeband]:RSYNc[:STATe]" on page 698

[:BASeband]:RSYNc[:STATe]

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:RSYNc[:STATe] ON|OFF|1|0
:SENSe:BERT[:BASeband]:RSYNc[:STATe]?
```

This command sets the operating state of the resynchronization function.

ON This choice enables the resynchronization function.

OFF This choice disables the resynchronization function.

***RST** ON

Choices ON OFF 1 0

Key Entry **BERT Resync Off On**

Remarks N/A

[:BASeband]:STATe

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:STATe ON|OFF|1|0
:SENSe:BERT[:BASeband]:STATe?
```

This command sets the operating state of the bit error rate test (BERT) measurement.

ON This choice enables the BERT measurement.

OFF This choice disables the BERT measurement.

***RST** OFF

Choices ON OFF 1 0

Key Entry **BERT Off On**

Remarks N/A

[:BASeband]:STOP:CRITeria:EBIT

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:STOP:CRITeria:EBIT <val>
:SENSe:BERT[:BASeband]:STOP:CRITeria:EBIT?
```

This command specifies the threshold limit to stop the measurement.

***RST** 100

Range 0–1000000000

Key Entry **Error Count**

Remarks When the stop mode criteria is set to EBIT, the signal generator monitors the error bits and when it exceeds the set value, the signal generator stops the current BER measurement and waits for the next trigger.

EBIT must be the selection for this command to work. To select EBIT refer to "[:BASeband]:STOP:CRITeria[:SELect]".

[:BASeband]:STOP:CRITeria[:SELect]

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:STOP:CRITeria[:SELect] EBIT|NONE
:SENSe:BERT[:BASeband]:STOP:CRITeria[:SELect]?
```

This command determines which threshold criteria is used to prematurely stop the measurement.

EBIT This choice enables a specified number of bit errors to prematurely stop the measurement.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Choices EBIT NONE

Key Entry **Error Count** **No Thresholds**

Remarks The measurement will terminate no later than 200 ms after the threshold is exceeded.

[:BASeband]:TBITs

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:TBITs <val>
:SENSe:BERT[:BASeband]:TBITs?
```

This command specifies the total bit count to be measured in one measurement cycle.

***RST** +10000

Range 100–4294967295

Key Entry **Total Bits**

Remarks N/A

[:BASeband]:TRIGger:BDELay

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:BDELay <val>
:SENSe:BERT[:BASeband]:TRIGger:BDELay?
```

This command specifies the number of bits to delay the trigger signal.

***RST** 0

Range 0–65535

Key Entry **Delay Bits**

Remarks This command is valid only when the trigger bit delay function is on. Refer to "[:BASeband]:TRIGger:BDELay:STATe".

[:BASeband]:TRIGger:BDELay:STATe

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:BDELay:STATe ON|OFF|1|0
:SENSe:BERT[:BASeband]:TRIGger:BDELay:STATe?
```

This command sets the operating state of the trigger delay function.

ON This choice enables the trigger delay function.

OFF This choice disables the trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Bit Delay Off On**

Remarks This command needs to be set to ON before the number of bits for the trigger delay can be set. Refer to "[:BASeband]:TRIGger:BDELay".

[:BASeband]:TRIGger:COUNt

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:COUNt <val>
:SENSe:BERT[:BASeband]:TRIGger:COUNt?
```

This command sets the number of times the bit error rate test (BERT) measurements

will repeat.

***RST** 1

Range 0–65535

Key Entry **Cycle Count**

Remarks With 0 set, the BER measurements are repeated until you set the BERT operating state is set to off. Refer to "[:BASeband]:STATe" on page 698.

[:BASeband]:TRIGger:POLarity

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:POLarity POSitive|NEGative
:SENSe:BERT[:BASeband]:TRIGger:POLarity?
```

This command selects the polarity of the trigger signal.

POSitive This choice triggers on the rising edge of the input data signal.

NEGative This choice triggers on the falling edge of the input data signal.

***RST** POS

Choices POSitive NEGative

Key Entry **Aux I/O Trigger Polarity Pos Neg**

Remarks This command is valid only when the trigger source AUX is selected. Refer to "[:BASeband]:TRIGger[:SOURce]" on page 701

[:BASeband]:TRIGger[:SOURce]

Supported All with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger[:SOURce] IMMediate|KEY|EXT|BUS|AUX
:SENSe:BERT[:BASeband]:TRIGger[:SOURce]?
```

This command selects the triggering type for starting the bit error rate test (BERT) measurements.

IMMediate This choice begins the measurement directly after synchronization has been achieved.

KEY This choice begins the measurement when the front panel **Trigger** key is pressed, provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.

EXT	This choice begins the measurement as soon as a trigger signal is applied to the rear panel connector provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.
BUS	This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.
AUX	This choice triggers an event using the rear panel AUX I/O connector pin #22. Refer to the *User's Guide*.

***RST** KEY

Choices IMMediate KEY EXT BUS AUX

Key Entry **Immediate** **Trigger Key** **Ext** **Bus** **Aux I/O**

Remarks N/A

TETRA Subsystem–Option 402 ([:SOURce]:RADio:TETRa)

:ALPha

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:ALPHa <val>
[:SOURce]:RADio:TETRa:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +3.50000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 716.

:BBCLock

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:TETRa:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Choices INT[1] EXT[1]

Key Entry **BBG Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BBT <val>
[:SOURce]:RADio:TETRa:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 716.

:BRATe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BRATe <val>
[:SOURce]:RADio:TETRa:BRATe?
```

This command sets the bit rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +3.60000000E+004

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Mbps	1–50 Mbps
FSK2			
MSK			
C4FM	2	2–100 Mbps	2–50 Mbps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
QPSK	2	2–100 Mbps	2–50 Mbps
QPSKIS95			
QPSKISAT			
D8PSK	3	3–100 Mbps	3–50 Mbps
EDGE			
FSK8			
PSK8			
FSK16	4	4–100 Mbps	4–50 Mbps
PSK16			
QAM16			
QAM32	5	5–100 Mbps	5–50 Mbps
QAM64	6	6–100 Mbps	6–50 Mbps
QAM256	7	8–100 Mbps	8–50 Mbps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 716, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated and will impact the relative timing of the modulated data, as well as the actual filter response (see ":SRATe" on page 741).

A change in the bit rate value will affect the symbol rate value; refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720.

:BURSt:PN9

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:PN9 NORMal|QUICk
[:SOURce]:RADio:TETRa:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Choices NORMal QUICk

Key Entry **PN9 Mode Normal Quick**

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SCRamble:SEED

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SCRamble:SEED <32-bit val>
[:SOURce]:RADio:TETRa:BURSt:SCRamble:SEED?
```

This command sets the 32-bit scramble seed value.

***RST** #HFFFFFFFF

Range #H0–#HFFFFFFFF

Key Entry **Scramble Seed**

Remarks Although values may be set using this command, it does not active that scramble function.

Refer to ":BURSt:SCRamble[:STATe]" on page 706 to enable the scrambling function.

:BURSt:SCRamble[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SCRamble[:STATe] ON|OFF|1|0
[:SOURce]:RADio:TETRa:BURSt:SCRamble[:STATe]?
```

This command enables or disables the scramble function.

ON (1) This choice scrambles data on the related fields, using the seed setting.

OFF (0) This choice disables the scramble function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Scramble Off On**

Remarks To set the seed value, refer to ":BURSt:SCRamble:SEED" on page 706.

:BURSt:SHAPe:FALL:DELay

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 708 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FALL:TIME

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–50

Key Entry Fall Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 709 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FDELay

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FDELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry Fall Delay

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 707 performs the same

function; in compliance withe the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:FTIMe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:FTIMe?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–50

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 707 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RDELay

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RDELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –14.3750 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal

generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 710 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –14.3750 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 709 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 711 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe:RTIMe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:TETRa:BURSt:SHAPe:RTIMe?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +8.00000000E+000

Range 0.1250–22.5000

Key Entry Rise Time

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720. Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 710 performs the same function;

in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:TETRa:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

SINE — This choice selects a state that is defined by the burst rise and fall *RST values as the default burst shape type.

"<file name>" — This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Choices SINE "<file name>"

Key Entry **Sine** **User File**

Remarks N/A

:BURSt[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:TETRa:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) — This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) — This choice enables the transmission of unframed data.

***RST** 0

Choices ON OFF 1 0

Key Entry **Data Format Pattern Framed**

Remarks N/A

:CHANnel

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:CHANnel EVM|ACP
[:SOURce]:RADio:TETRa:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 716.

:DATA

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:DATA PN9|PN11|PN15|PN20|PN23|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:DATA?
```

This command sets the data pattern for unframed transmission.

***RST** PN23

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file

name syntax.

:DATA:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:DATA:FIX4 <val>
[:SOURce]:RADio:TETRa:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the TETRa modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. To change the data type, refer to ":DATA" on page 713.

:DEFault

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:DEFault
```

This command returns all of the TETRA modulation format parameters to factory settings. It does not affect any other signal generator parameters.

***RST** N/A

Range N/A

Key Entry **Restore TETRA Factory Default**

Remarks N/A

:EDATa:DELay

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** N/A

Range N/A

Key Entry N/A

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:EDCLock SYMBol|NORMal
[:SOURce]:RADio:TETRa:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Choices SYMBol NORMal

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 703 to select EXT as the data clock type.

:EREFerence

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:EREFerence INT|EXT
[:SOURce]:RADio:TETRa:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Choices INT EXT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value

must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 716 to enter the external reference frequency setting.

:EREFerence:VALue

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:EREFerence:VALue <val>
[:SOURce]:RADio:TETRa:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 715 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:TETRa:FILTer?
```

This command selects the pre-modulation filter type.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This

filter is only used for IS-95 baseband filtering.

IS95_MOD — This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ — This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

AC4Fm — This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

UGGaussian — This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<User FIR>" — This variable is any filter file that you have stored into memory.

***RST** RNYQ

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<user FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:IQ:SCALe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:IQ:SCALe <val>
[:SOURce]:RADio:TETRa:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +65

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:TETRa:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 720.

Refer to ":SRATe" on page 741 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:TETRa:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

Remarks N/A

:MODulation:UFSK

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:MODulation:UFSK "<file name>"
[:SOURce]:RADio:TETRa:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 720 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation:UIQ

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:MODulation:UIQ "<file name>"
[:SOURce]:RADio:TETRa:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

***RST** N/A

Range N/A

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 720 to change the current modulation type.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:MODulation[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|
FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM256|UIQ|UFSK
[:SOURce]:RADio:TETRa:MODulation[:TYPE]?
```

This command sets the modulation type for the TETRA personality.

***RST** P4DQPSK

Choices BPSK QPSK IS95QPSK GRAYQPSK OQPSK IS95OQPSK π4DQPSK PSK8 PSK16 D8PSK MSK FSK2 FSK4 FSK8 FSK16 C4FM QAM4 QAM16 QAM32 QAM64 QAM256 UIQ UFSK

Key Entry **BPSK QPSK IS-95 QPSK Gray Coded QPSK OQPSK IS-95 OQPSK π/4 DQPSK 8PSK 16PSK D8PSK MSK 2-Lvl FSK 4-Lvl FSK 8-Lvl FSK 16-Lvl FSK C4FM 4QAM 16QAM 32QAM 64QAM 256QAM User I/Q User FSK**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:TETRa:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Phase Polarity Normal Invert**

Remarks N/A

:SECondary:RECall

Supported All with Option 402

`[:SOURce]:RADio:TETRa:SECondary:RECall`

This command recalls the secondary frame configuration, overwriting the current state.

***RST** N/A

Range N/A

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 721.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 722.

:SECondary:SAVE

Supported All with Option 402

`[:SOURce]:RADio:TETRa:SECondary:SAVE`

This command saves the current frame configuration as the secondary frame with the filename `TETRa_SECONDARY_FRAME`.

***RST** N/A

Range N/A

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to ":SECondary:RECall" on page 721.

:SECondary:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SECondary:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:TETRa:SECondary:TRIGger[:SOURce]?
```

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT — This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 744.

BUS — This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** N/A

Choices KEY EXT BUS

Key Entry **Trigger Key Ext Bus**

Remarks N/A

:SECondary[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:TETRa:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Choices ON OFF 1 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 721.

:SLOT[1]|2|3|4:DCCustom

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom?
```

This command configures the downlink continuous custom timeslot data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT

P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT**
4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's
64 1's & 64 0's

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:DCCustom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:DCNormal:B1

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:B1 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:B1?
```

This command sets the first 14 broadcast bits for the selected downlink continuous normal timeslot.

***RST** #H0000

Range #H0–#H3FFF

Key Entry **B1**

Remarks N/A

:DCNormal:B2

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:B2 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:B2?
```

This command sets the last 16 broadcast bits for the selected downlink continuous normal timeslot.

***RST** #H0000

Range #H0–#HFFFF

Key Entry **B2**

Remarks N/A

:SLOT[1]|2|3|4:DCNormal:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:
TSEQuence <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal:TSEQuence?
```

This command sets the normal training sequence bits (30-bit midamble) for the selected downlink continuous normal timeslot.

***RST** #H343A74

Range #H0–#H3FFFFF

Key Entry **TS**

Remarks When 1E90DE is selected, the data fields are scrambled as separate logical channels.

:SLOT[1]|2|3|4:DCNormal[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal[:DATA] PN9|PN11|
PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal[:DATA]?
```

This command configures the selected downlink continuous normal timeslot data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:DCNormal[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCNormal[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous normal timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4:DCSync:B

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:B <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:B?
```

This command sets the broadcast bits for the selected downlink continuous synchronization timeslot.

***RST** #H00000000

Range #H0–#H3FFFFFFF

Key Entry **B**

Remarks N/A

:SLOT[1]|2|3|4:DCSync:FCOR

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:FCOR <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:FCOR?
```

This command sets the frequency correction bits for the selected downlink continuous synchronization timeslot.

***RST** #HFF0000000000000000FF

Range #H0–#HFFFFFFFFFFFFFFFFFFFF

Key Entry **FCOR**

Remarks N/A

:SLOT[1]|2|3|4:DCSync:SSB

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:SSB <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:SSB?
```

This command sets the synchronization block bits for the selected downlink synchronization continuous timeslot.

***RST** #H00000000000000000000000000000000

Range #H0–#HFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

Key Entry **SSB**

Remarks N/A

:SLOT[1]|2|3|4:DCSync:STS

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:STS <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:STS?
```

This command sets the synchronization training sequence for the selected downlink continuous synchronization timeslot.

***RST** #H30673A7067

Range #H0–#H3FFFFFFFFF

Key Entry **STS**

Remarks N/A

:SLOT[1]|2|3|4:DCSync[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA] PN9|PN11|
PN15|PN20|PN23FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]?
```

This command configures the selected downlink continuous synchronization timeslot data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous synchronization timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4:DDCustom

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDCustom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDCustom?
```

This command configures the downlink discontinuous custom timeslot data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:DDCustom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDCustom:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDCustom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4:DDNormal:B1

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:B1 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:B1?
```

This command sets the first 14 broadcast bits for the selected downlink discontinuous

normal timeslot.

***RST** #H0000

Range #H0–#H3FFF

Key Entry **B1**

Remarks N/A

:SLOT[1]|2|3|4:DDNormal:B2

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:B2 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:B2?
```

This command sets the last 16 broadcast bits for the selected downlink continuous normal timeslot.

***RST** #H0000

Range #H0–#HFFFF

Key Entry **B2**

Remarks N/A

:SLOT[1]|2|3|4:DDNormal:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:TSEQuence <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:TSEQuence?
```

This command specifies the normal training sequence bits (30-bit midamble) for the selected downlink discontinuous normal timeslot.

***RST** #H343A74

Range #H0–#H3FFFFFFF

Key Entry **TS**

Remarks When 1E90DE is selected, the data fields are scrambled as separate logical channels.

:SLOT[1]|2|3|4:DDNormal[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal[:DATA] PN9|PN11|
PN15|PN20|PN23FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal[:DATA]?
```

This command configures the selected downlink discontinuous normal timeslot data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:DDNormal[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous normal timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SLOT[1]|2|3|4:DDSync:B

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:B <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:B?
```

This command sets the broadcast bits for the selected downlink discontinuous synchronization timeslot.

***RST** #H00000000

Range #H0–#H3FFFFFFF

Key Entry **B**

Remarks N/A

:SLOT[1]|2|3|4:DDSync:FCOR

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:FCOR <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:FCOR?
```

This command sets the frequency correction bits for the selected downlink discontinuous synchronization timeslot.

***RST** #HFF0000000000000000FF

Range #H0–#HFFFFFFFFFFFFFFFFFFFF

Key Entry **FCOR**

Remarks N/A

:SLOT[1]|2|3|4:DDSync:SSB

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:SSB <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:SSB?
```

This command sets the synchronization block bits for the selected downlink synchronization discontinuous timeslot.

***RST** #H00000000000000000000000000000000

Range #H0–#HFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

Key Entry **SSB**

Remarks N/A

:SLOT[1]|2|3|4:DDSync:STS

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:STS <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:STS?
```

This command sets the synchronization training sequence for the selected downlink discontinuous synchronization timeslot.

***RST** #H30673A7067

Range #H0–#H3FFFFFFFFF

Key Entry **STS**

Remarks N/A

:SLOT[1]|2|3|4:DDSync[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA] PN9|PN11|
PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA]?
```

This command configures the selected downlink discontinuous synchronization timeslot data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:DDSync[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous synchronization timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. To change the data type, refer to ":SLOT[1]|2|3|4:DCNormal[:DATA]" on page 724.

:SLOT[1]|2|3|4:POWer

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:POWer MAIN|DELTa
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Choices MAIN DELTa

Key Entry **Timeslot Ampl Main Delta**

Remarks N/A

:SLOT[1]|2|3|4:STATe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:STATe ON|OFF|1|0
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:STATe?
```

This command enables or disables the selected timeslot.

***RST** *Timeslot 1*: 1 *Timeslot 2-4*:

Choices ON OFF 1 0

Key Entry **Timeslot Off On**

Remarks Continuous timeslots cannot be disabled.

:SLOT[1]|2|3|4:UC1:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC1:TSEQuence <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC1:TSEQuence?
```

This command specifies the extended training sequence bits (30-bit midamble) for the selected uplink control 1 timeslot.

***RST** #H2743A743

Range #H0–#H3FFFFFFF

Key Entry **TS**

Remarks N/A

:SLOT[1]|2|3|4:UC1[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA] PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA]?
```

This command configures the selected uplink control 1 data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:UC1[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA]:FIX4?
```

This command configures the uplink control 1 data field FIX4 value for the selected

timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks N/A

:SLOT[1]|2|3|4:UC2:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC2:TSEQuence <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC2:TSEQuence?
```

This command specifies the extended training sequence bits (30-bit midamble) for the selected uplink control 2 timeslot.

***RST** #H2743A743

Range #H0–#H3FFFFF

Key Entry **TS**

Remarks N/A

:SLOT[1]|2|3|4:UC2[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC2[:DATA] PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC2[:DATA]?
```

This command configures the selected uplink control 2 data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:UC2[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC2[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UC2[:DATA]:FIX4?
```

This command configures the uplink control 2 data field FIX4 value for the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks N/A

:SLOT[1]|2|3|4:UCUStom

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UCUStom?
```

This command configures the uplink custom data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:UCUStom:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UCUStom:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UCUStom:FIX4?
```

This command configures the selected uplink custom data field to FIX4 (4-bit repeating

sequence data pattern).

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks N/A

:SLOT[1]|2|3|4:UNORmal:TSEQuence

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UNORmal:TSEQuence <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UNORmal:TSEQuence?
```

This command specifies the extended training sequence bits (22-bit midamble) for the selected uplink normal timeslot.

***RST** #H343A74

Range #H0–#H3FFFFF

Key Entry **TS**

Remarks When 1E90DE is selected, the data fields are scrambled as separate logical channels.

:SLOT[1]|2|3|4:UNORmal[:DATA]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UNORmal[:DATA] PN9|PN11|
PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UNORmal[:DATA]?
```

This command configures the selected uplink normal data field.

***RST** PN9

Choices PN9 PN11 PN15 PN20 PN23 FIX4 "<file name>" EXT P4 P8 P16 P32 P64

Key Entry **PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:SLOT[1]|2|3|4:UNORmal[:DATA]:FIX4

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UNORmal[:DATA]:FIX4 <val>
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UNORmal[:DATA]:FIX4?
```

This command configures the uplink normal data field FIX4 value for the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks N/A

:SLOT[1]|2|3|4[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4[:TYPE] UCUStom|UC1|UC2|
UNORmal|DDNormal|DDSync|DCNormal|DCSync|DCCustom|DDCustom
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

***RST** *Timeslot 1*: UCUS *Timeslot 2-4*: UNOR

Choices UCUStom UC1 UC2 UNORmal DDNormal DDSync DCNormal DCSync DCCustom DDCustom

Key Entry **Up Custom** **Up Control 1** **Up Control 2** **Up Normal** **Dn Normal Disc** **Dn Sync Disc** **Dn Normal Cont** **Dn Sync Cont** **Dn Custom Cont** **Dn Custom Disc**

Remarks When downlink is selected and the frame is uplink, the following mapping is made to convert the uplink protocols to downlink; an error

will be generated.

From	To (Continuous Downlink)	To (Discontinuous Downlink)
UC1	DCCustom	DDCustom
UC2	DCCustom	DDCustom
UCUSTom	DCCustom	DDCustom
UNORmal	DCNormal	DDNormal

When uplink is selected and the frame is downlink, the following mapping is made to convert the downlink protocols to uplink; an error will be generated.

From	To
DCCustom/ DDCustom	UCUSTom
DCNormal/ DDNormal	UNORmal
DCSync/ DDSync	UCUSTom

When continuous downlink protocols are selected, all timeslots must be on, and they cannot be turned off. Any attempts to do so will generate an error.

:SOUT

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:TETRa:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Choices FRAME SLOT ALL

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks To change the synchronization output offset value, refer to ":SOUT:OFFSet" on page 740.

:SOUT:OFFSet

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SOUT:OFFSet <val>
[:SOURce]:RADio:TETRa:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

***RST** +0

Range –509 to 509

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 739.

:SOUT:SLOT

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SOUT:SLOT <val>
[:SOURce]:RADio:TETRa:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +1

Range 1–4

Key Entry **Begin Timeslot #**

Remarks SLOT must be selected as the output signal type for the EVENT 1 rear panel connector.

To change the output of the EVENT1 rear panel connector to SLOT,

refer to ":SOUT" on page 739.

:SRATe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:SRATe <val>
[:SOURce]:RADio:TETRa:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of bits per second (bps–Mbps) and the maximum range value is dependent upon the source of data (internal or external), the modulation type, and filter.

***RST** +1.80000000E+004

Range

Modulation Type	*Bits per Symbol*	*Internal Data*	*External Serial Data*
BPSK	1	1–50 Msps	1–50 Msps
FSK2			
MSK			
C4FM	2	1–50 Msps	1–25 Msps
FSK4			
OQPSK			
OQPSK195			
P4QPPSK			
QAM4			
QPSK			
QPSKIS95			
QPSKISAT			
D8PSK	3	1–33.33 Msps	1–16.67 Msps
EDGE			
FSK8			
PSK8			
FSK16	4	1–25 Msps	1–12.5 Msps
PSK16			
QAM16			
QAM32	5	1–20 Msps	1–10 Msps
QAM64	6	1–16.67 Msps	1–8.33 Msps
QAM256	7	1–12.50 Msps	1–6.25 Msps

Key Entry Symbol Rate

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 716, the upper bit rate will be restricted in line with

the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well as the actual filter response (see ":BRATe" on page 704).

A change in the symbol rate value will affect the bit rate value; refer to ":BRATe" on page 704 for a list of the minimum and maximum bit rate values.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 720.

:TRIGger:TYPE

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:TETRa:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 743.
SINGle	The framed data sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger:TYPE:CONTinuous[:TYPE] FREE|
TRIGger|RESet
[:SOURce]:RADio:TETRa:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This command customizes the continuous trigger selection.

FREE This choice immediately transmits a framed data sequence that is continuously repeated.

TRIGger This choice causes the framed data sequence to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated framed data sequence begins.

RESet This choice immediately restarts a continuously repeated framed data sequence upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 742.

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:TETRa:TRIGger:TYPE:GATE:ACTive?
```

This command toggles the polarity of the active state of the external gating input signal; GATE must be selected as the arb trigger type.

LOW The sequence runs while the selected external control gating signal is low and restarts when the gate returns to the high level.

HIGH The sequence runs while the selected external control gating signal is high and restarts when the gate returns to the low level.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select GATE as the ARB trigger type, refer to ":TRIGger:TYPE" on page 742.

:TRIGger[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 744.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

***RST** KEY

Choices KEY EXT BUS

Key Entry **Trigger Key** **Ext** **Bus**

Remarks N/A

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|
EPT2|EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the

PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 744.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal:DELay?
```

This command specifies the number of delay bits for the external trigger delay.

The variable <val> is expressed in bits.

***RST** +0

Range 0–1048576

Key Entry **Ext Delay Bits**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 744.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal:DELay:STATe
ON|OFF|1|0
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 744.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:TETRa:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity of the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 744.

[:STATe]

Supported All with Option 402

```
[:SOURce]:RADio:TETRa[:STATe] ON|OFF|1|0
[:SOURce]:RADio:TETRa[:STATe]?
```

This command enables or disables the TETRA modulation format.

***RST** OFF

Choices ON OFF 1 0

Key Entry **TETRA Off On**

Remarks Although the TETRA modulation is enabled with this command, the

RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

Wideband CDMA ARB Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP:ARB)

:CLIPping:I

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:I <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:I?
```

This command limits the modulation level of the waveform's I component to a percentage of full scale.

The variable <val> is expressed in units of percent.

***RST** +1.00000000E+002

Range 10–100

Key Entry **Clip III To**

Remarks N/A

:CLIPping:POSition

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:POSition PRE|POST
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:POSition?
```

This command specifies whether a waveform is clipped before (PRE) or after (POST) FIR filtering.

***RST** PRE

Choices PRE POST

Key Entry **Clip At PRE POST FIR Filter**

Remarks N/A

:CLIPping:Q

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:Q <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:Q?
```

This command limits the modulation level of the waveform's Q component to a percentage of full scale.

The variable <val> is expressed in units of percent.

***RST** +1.00000000E+002

Range 10–100

Key Entry **Clip |Q| To**

Remarks N/A

:CLIPping:TYPE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:TYPE IJQ|IORQ
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping:TYPE?
```

This command selects either IJQ or IORQ as the clipping type.

IJQ The combined I and Q waveform will be clipped (circular clipping).

IORQ The I and Q components of the waveform are clipped independently (rectangular clipping). I and Q can be clipped to different levels using this mode.

***RST** IJQ

Choices IJQ IORQ

Key Entry **Clipping Type |I+jQ| |I|,|Q|**

Remarks N/A

:CLIPping[:IJQ]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping[:IJQ] <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:CLIPping[:IJQ]?
```

This command clips (limits) the modulation level of the combined I and Q waveform to a percentage of full scale.

The variable <val> is expressed in units of percent.

***RST** +1.00000000E+002

Range 10–100

Key Entry **Clip |I+jQ| To**

Remarks N/A

:CRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:CRATe <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:CRATe?
```

This command sets the chip rate value.

***RST** +3.84000000E+006

Range 3456000–4224000

Key Entry **Chip Rate**

Remarks N/A

:FILTer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer RNYQuist|NYQuist|GAUSsian|
RECTangle|WCDMA|AC4Fm|IS2000SRDS|UGGaussian|"<User FIR>"
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer?
```

This command selects the pre-modulation filter type.

WCDMA	This choice selects a 0.22 Nyquist filter optimized for ACP.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
IS2000SR3DS	This choice selects an IS-2000 standard, spread rate 3 direct spread filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter

(Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<User FIR>" This variable is any filter file that you have stored into memory.

***RST** WCDMA

Choices RNYQuist NYQuist GAUSsian RECTangle WCDMA AC4Fm IS2000SRDS UGGaussian "<User FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **WCDMA** **APCO 25 C4FM** **IS-95** **UN3/4 GSM Gaussian** **IS-2000 SR3 DS** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:FILTer:ALPHa

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer:ALPHa <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer:ALPHa?
```

This command sets the alpha value for the Nyquist or root Nyquist filter.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +2.20000000E–001

Range 0.000–1.000

Key Entry **FiLter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 749.

:FILTer:BBT

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer:BBT <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 749.

:FILTer:CHANnel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer:CHANnel EVM|ACP
[:SOURce]:RADio:WCDMa:TGPP:ARB:FILTer:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** ACP

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":FILTer" on page 749.

:IQMap

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:IQMap NORMal|INVert
[:SOURce]:RADio:WCDMa:TGPP:ARB:IQMap?
```

This command selects whether or not the I/Q outputs will be inverted.

NORMal This choice selects normal polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVert

Key Entry **I/Q Mapping Normal Invert**

Remarks N/A

:LINK

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK DOWN|UP
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK?
```

This command selects either a downlink or uplink channel configuration.

***RST** DOWN

Choices DOWN UP

Key Entry Link Down Up

Remarks N/A

:LINK:DOWN:OACP

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:OACP ADJ|ALT
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:OACP?
```

This command selects the channel power optimization type for any downlink channel W-CDMA setup.

ADJ This choice optimizes for adjacent channel power.

ALT This choice optimizes for alternate channel power.

***RST** ADJ

Choices ADJ ALT

Key Entry Optimize ACP ADJ ALT

Remarks This command is operational for any downlink channel W-CDMA setup.

To change the current W-CDMA setup information, refer to ":LINK:DOWN:SETup" on page 753.

:LINK:DOWN:SETup

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup DPCH1|DPCH3|PPSCH|
PPDPCH1|PPDPCH3|TM1D16|TM1D32|TM1D64|TM2|TM3D16|TM3D32|TM4|MCARrier|
"<file name>"
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup?
```

This command defines the multicarrier waveform.

DPCH1	This choice selects 1 dedicated physical channel.
DPCH3	This choice selects 3 dedicated physical channels.
PPSCH	This choice selects a primary command control physical channel (PCCPCH) with a synchronization channel (SCH).
PPDPCH1	This choice selects a primary command control physical channel (PCCPCH) with a dedicated physical channel (DPCH).
PPDPCH3	This choice selects a primary command control physical channel (PCCPCH) with 3 dedicated physical channels.
TM1D16	This choice selects a test model 1 with 16 dedicated physical channels.
TM1D32	This choice selects a test model 1 with 32 dedicated physical channels.
TM1D64	This choice selects a test model 1 with 64 dedicated physical channels.
TM2	This choice selects a test model 2.
TM3D16	This choice selects a test model 3 with 16 dedicated physical channels.
TM3D32	This choice selects a test model 3 with 32 dedicated physical channels.
TM4	This choice selects a test model 4.

***RST** DPCH1

Choices DPCH1 DPCH3 PPSCH PPDPCH1 PPDPCH3 TM1D16 TM1D32 TM1D64 TM2 TM3D16 TM3D32 TM4 MCARrier "<file name>"

Key Entry **1 DPCH** **3 DPCH** **PCCPCH + SCH** **PCCPCH + SCH + 1 DPCH** **PCCPCH + SCH + 3 DPCH** **Test Model 1 w/ 16 DPCH** **Test Model 1 w/ 32 DPCH** **Test Model 1 w/ 64 DPCH** **Test Model 2** **Test Model 3 w/ 16 DPCH** **Test Model 3 w/ 32 DPCH** **Test Model 4**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:LINK:DOWN:SETup:MCARrier

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:`MCARrier
CAR2|CAR3|CAR4|<"file name">
`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier?`

This command defines the type of multicarrier W-CDMA setup.

`CAR2` a standard 2-carrier setup with the following settings:

Carrier 1: PCCPCH + SCH, –7.5 MHz frequency offset, 0 dB power

Carrier 2: PCCPCH + SCH, 7.5 MHz frequency offset, 0 dB power

CAR3 a standard 3-carrier setup with the following settings:

Carrier 1: PCCPCH + SCH, –5 MHz frequency offset, 0 dB power

Carrier 2: PCCPCH + SCH, 0 kHz frequency offset, 0 dB power

Carrier 3: PCCPCH + SCH, 5 MHz frequency offset, 0 dB power

CAR4 a standard 4-carrier setup with the following settings:

Carrier 1: PCCPCH + SCH, –7.5 MHz frequency offset, 0 dB power

Carrier 2: PCCPCH + SCH, –2.5 MHz frequency offset, 0 dB power

Carrier 3: PCCPCH + SCH, 2.5 MHz frequency offset, 0 dB power

Carrier 4: PCCPCH + SCH, 7.5 MHz frequency offset, 0 dB power

***RST** CAR2

Choices CAR2 CAR3 CAR4 "<file name>"

Key Entry **2 Carriers** **3 Carriers** **4 Carriers**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:LINK:DOWN:SETup:MCARrier:CLIPping:I

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping:I <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping:I?
```

This command limits the modulation level of the waveform's I component to a percentage of full scale.

The variable <val> is expressed in units of percent.

***RST** +1.00000000E+002

Range 10–100

Key Entry **Clip III To**

Remarks N/A

:LINK:DOWN:SETup:MCARrier:CLIPping:Q

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping:Q <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping:Q?
```

This command limits the modulation level of the waveform's Q component to a percentage of full scale.

The variable <val> is expressed in units of percent.

***RST** +1.00000000E+002

Range 10–100

Key Entry **Clip |Q| To**

Remarks N/A

:LINK:DOWN:SETup:MCARrier:CLIPping:TYPE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping:TYPE
IJQ|IORQ
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping:TYPE?
```

This command selects either IJQ or IORQ as the clipping type.

IJQ The combined I and Q waveform will be clipped (circular clipping).

IORQ The I and Q components of the waveform are clipped independently (rectangular clipping). I and Q can be clipped to different levels using this mode.

***RST** IJQ

Choices IJQ IORQ

Key Entry **Clipping Type |I+jQ| |I|,|Q|**

Remarks N/A

:LINK:DOWN:SETup:MCARrier:CLIPping[:IJQ]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:
CLIPping[:IJQ] <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:CLIPping[:IJQ]?
```

This command clips (limits) the modulation level of the combined I and Q waveform to a percentage of full scale.

The variable <val> is expressed in units of percent.

***RST** +1.00000000E+002

Range 10–100

Key Entry **Clip |I+jQ| To**

Remarks N/A

:LINK:DOWN:SETup:MCARrier:INCRement:SCRamble

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:INCRement:
SCRamble ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:INCRement:
SCRamble?
```

This command enables or disables the auto-increment of scramble codes between carriers.

***RST** 0

Choices ON OFF 1 0

Key Entry **Increment Scramble Code Off On**

Remarks N/A

:LINK:DOWN:SETup:MCARrier:INCRement:TIMing

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:INCRement:
TIMing ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:INCRement:
TIMing?
```

This command enables or disables the auto-increment of timing offsets between carriers.

***RST** 0

Choices ON OFF 1 0

Key Entry **Increment Timing Offset Off On**

Remarks N/A

:LINK:DOWN:SETup:MCARrier:STORe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:
STORe "<file name>"
```

This command stores the current multicarrier setup information.

The stored file contains information including the digital modulation format, number of carriers, frequency spacing, and power settings for the multicarrier setup.

***RST** N/A

Choices N/A

Key Entry **Store Custom W-CDMA State**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:LINK:DOWN:SETup:MCARrier:TABLe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:TABLe INIT|
APPend|<carrier_num>,DPCH1|DPCH3|PPSCH|PPDPCH1|PPDPCH3|TM1D16|TM1D32|
TM1D64|TM2|TM3D16|TM3D32|"<file name>",<freq_offset>,<power>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:TABLe?
<carrier_num>
```

This command defines the multicarrier format and waveform.

Use INIT to clear the table and define the parameters for the first carrier; use APPend to add new channels. To edit an existing carrier, use its carrier number (<carrier_num>).

The variable <freq_offset> is expressed in units of Hertz (kHz–MHz).

The variable <power> is expressed in units of decibels (dB).

The carrier type, frequency offset, and power level are returned when a query is initiated. The output format is as follows:

```
<carrier type>,<freq_offset>,<power>
```

INIT	This choice clears the current information and creates a new one-row table, allowing for further definition using additional parameters.
APPend	This choice adds rows to an existing table. The maximum number of rows for one table is 16.
DPCH1	This choice selects 1 dedicated physical channel.
DPCH3	This choice selects 3 dedicated physical channels.
PPSCH	This choice selects a primary command control physical channel (PCCPCH) with a synchronization channel (SCH).
PPDPCH1	This choice selects a primary command control physical channel (PCCPCH) with a dedicated physical channel (DPCH).
PPDPCH3	This choice selects a primary command control physical channel (PCCPCH) with 3 dedicated physical channels.
TM1D16	This choice selects a test model 1 with 16 dedicated physical channels.
TM1D32	This choice selects a test model 1 with 32 dedicated physical channels.
TM1D64	This choice selects a test model 1 with 64 dedicated physical channels.
TM2	This choice selects a test model 2.
TM3D16	This choice selects a test model 3 with 16 dedicated physical channels.

TM3D32	This choice selects a test model 3 with 32 dedicated physical channels.
TM4	This choice selects a test model 4.
<MCARrier>	This variable specifies the number of multicarriers.

***RST** *carrier type*: PPSCH <*freq_offset*>: +7.50000000E+006 <*power*>: +0.00000000E+000

Range <*freq_offset*>: –37.5E6 to 37.5E6 <*power*>: –40 to 0

Choices INIT APPend <carrier_num> DPCH1 DPCH3 PPSCH PPDPCH1 PPDPCH3 TM1D16 TM1D32 TM1D64 TM1D64 TM2 TM3D16 TM3D32 TM4 MCARrier "<file name>" <freq_offset> <power>

Key Entry **1 DPCH** **3 DPCH** **PCCPCH + SCH** **PCCPCH + SCH + 1 DPCH** **PCCPCH + SCH + 3 DPCH** **Test Model 1 w/ 16 DPCH** **Test Model 1 w/ 32 DPCH** **Test Model 1 w/ 64 DPCH** **Test Model 2** **Test Model 3 w/ 16 DPCH** **Test Model 3 w/ 32 DPCH** **Test Model 4**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":LINK:DOWN:SETup:TABLe:APPLy" on page 760.

:LINK:DOWN:SETup:MCARrier:TABLe:NCARriers

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:MCARrier:TABLe:NCARriers?`

This command queries the number of carriers specified for the W-CDMA multicarrier waveform.

***RST** +2

Choices N/A

Key Entry N/A

Remarks N/A

:LINK:DOWN:SETup:STORe

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:STORe "<file name>"`

This command stores the current downlink setup information into the memory catalog with the entered file name.

Along with the contents of the W-CDMA channel table editor (channel types, Walsh code, power levels, PN offset, and data), this command stores the following information to the signal generator memory:

FIR filter
FIR filter file name
FIR filter alpha
FIR filter BbT
FIR filter channel (EVM or ACP)
I/Q mapping
link
spread type
spread rate
ARB reference clock source (internal or external)
ARB reference clock frequency
clipping
multicarrier spacing
radio configuration

***RST** N/A

Range N/A

Key Entry **Store Custom W-CDMA State**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:LINK:DOWN:SETup:TABLe:APPLy

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:TABLe:APPLy`

This command generates a W-CDMA signal based on the current values in the W-CDMA channel setup table editor.

***RST** N/A

Choices N/A

Key Entry **Apply Channel Setup**

Remarks N/A

:LINK:DOWN:SETup:TABLe:CHANnel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:TABLe:CHANnel INIT|
APPend|<chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,
<timing_offset>,<TFCI>,<TPC>,<scramble_code>,STANdard|RALTernate|
LALTernate,<scramble_offset>,RANDom|PN9|PINDicator|<data_val>,
<TFCI_power>,<TPC_power>,<pilot_power>,<pilot_bits>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:TABLe:CHANnel? <chan_num>
```

This command sets up the W-CDMA downlink channel parameters.

Use INIT to clear the table editor and define the parameters for the first channel; use APPend to add new channels. To edit an existing channel, use its channel number <chan_num>.

The <power>, <TFCI_power>, <TPC_power>, and <pilot_power> variables are expressed in units of decibels (dB).

The channel type, symbol rate, spread code, power, timing offset, TFCI value, TPC value, scramble code, scramble type, scramble offset, data type, TFCI power, TPC power, pilot power, and the number of pilot bits are returned when a query is initiated. The output format is as follows:

```
<chan_type>,<symbol_rate>,<spread_code>,<power>,<tDPCH_offset>,<TFCI>,
<TPC>,<scramble_code>,<scramble_type>,<scramble_code>,<scramble_offset>,
<data_type>,<TFCI_power>,<TPC_power>,<pilot_power>,<pilot_bits>
```

INIT	This choice clears the current information and creates a new one-row table, allowing for further definition using additional parameters.
APPend	This choice adds a row to an existing table.
<chan_num>	This variable sets the physical channel number.
<chan_type>	This variable sets the channel type.
<timing_offset>	This variable sets the symbol offset.
<TFCI>	This variable sets the transport format combination indicator.

<TPC>	This variable sets the transmit power control.
STANdard	This choice sets the scramble type to standard.
RALTernate	This choice sets the scramble type to right alternate.
LALTernate	This choice sets the scramble type to left alternate.
RANDom	This choice sets a randomly generated pseudo-random sequence pattern as output data.
PN9	This choice sets an internally generated 9-bit pseudo-random sequence pattern as output data.
PINDicator	This choice sets the paging indicator channel (PICH).
<data_val>	This variable sets the data value.
<TFCI_power>	This variable sets the transport format combination indicator power offset.
<TPC_power>	This variable sets the transport power control power offset.
<pilot_power>	This variable sets the pilot power offset.
<pilot_bits>	This variable sets the number of pilot bits that will be in the dedicated physical channel (DPCH).

Table 1 Variables and Channel Types

	SSCH	CPICH	PCCPCH	SCCPCH	PICH	DPCH	OCNS	PSCH
Channel number	X	X	X	X	X	X	X	X
Symbol rate	N/A	N/A	N/A	X	N/A	X	X	N/A
Spread code	N/A	X	X	X	X	X	X	N/A
Power	X	X	X	X	X	X	X	X
Symbol offset	N/A	N/A	N/A	N/A	X	X	N/A	N/A
TFCI	N/A	N/A	N/A	X	N/A	X	N/A	N/A
TPC	N/A	N/A	N/A	N/A	N/A	X	N/A	N/A
Scramble code	X	X	X	X	X	X	X	N/A
Standard	X	X	X	N/A	X	X	X	N/A
Right alternate	X	X	X	N/A	X	X	X	N/A
Left alternate	X	X	X	N/A	X	X	X	N/A

Table 1 Variables and Channel Types

	SSCH	CPICH	PCCPCH	SCCPCH	PICH	DPCH	OCNS	PSCH
Scramble offset	X	X	X	X	X	X	X	N/A
Random	N/A	N/A	X	X	X	X	X	N/A
PN9	N/A	N/A	X	X	X	X	X	N/A
Paging Indicator	N/A	N/A	N/A	N/A	X	N/A	N/A	N/A
Data value	N/A	N/A	X	N/A	X	X	X	N/A
TFCI power	N/A	N/A	N/A	N/A	X	N/A	N/A	N/A
Pilot power offset	N/A	N/A	N/A	N/A	X	N/A	N/A	N/A
Pilot bits	N/A	N/A	N/A	X	X	N/A	N/A	N/A

***RST** *<chan_type>:* DPCH*<symbol_rate>:* +3.00000000E+004
<spread_code>: +8 *<scramble_offset>:* +0.00000000E+000
power: +0.00000000E+000 *<tDPCH_offset>:* +0 *<TFCI>:* +0
<TPC>: #H5555 *<scramble_code>:* +0 *scramble type:* STAN
<TFCI_power>: +0.00000000E+000
<TPC_power>: +0.00000000E+000 *<pilot_power>:* +0.00000000E+000
<pilot_bits>: +4

Range *<power>:* –40 to 0 *<tDPCH_offset>:* 0–149 *<TFCI>:* 0–1023
<TPC>: 0000–7FFF *<scramble_code>:* 0–511
<scramble_offset>: 0–15 *<data_val>:* 00000000–11111111
<TFCI_power>: –20 to 20 *<TPC_power>:* –20 to 20
<pilot_power>: 0000–7FFF *<pilot_bits>:* 0–511

SCCPCH Channel

<symbol_rate>	*<spread_code>*	**<pilot_bits>*
15 ksps	0–256	0,8
30 ksps	0–128	0,8
60 ksps	0–64	0,8
120 ksps	0–32	0,8
240 ksps	0–16	0,16
480 ksps	0–8	0,16
960 ksps	0–4	0,16

All Other Channels

<symbol_rate>	*<spread_code>*	*<pilot_bits>*
7.5 ksps	0–511	4
15 ksps	0–255	2,4,8
30 ksps	0–127	4,8
60 ksps	0–63	8
120 ksps	0–31	8
240 ksps	0–15	16
480 ksps	0–7	16
960 ksps	0–3	16

Choices INIT APPend STANdard RALTernate LALTernate RANDom PN9 PINDicator

Key Entry **Channel Type** **Symbol Rate** **First Spread Code** **Power** **Spread Code** **TFCI Field Off On** **Scramble Code** **Scramble Offset** **Random** **PN9** **Standard** **Left Alternate** **Right Alternate** **PCCPCH** **SCCPCH** **PSCH** **SSCH** **CPICH** **DPCH** **PICH** **OCNS**

Field Entry `Spread Code` `Power` `Timing Offset` `TFCI` `Scramble Code` `TFCI Power` `TPC Power` `Pilot Power` `Pilot Bits` `Data` `Scramble Type` `Scramble Offset`

Remarks For additional information, refer to the 3GPP TS 25.211 (V 3.7) standard.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":LINK:DOWN:SETup:TABLe:APPLy" on page 760.

:LINK:DOWN:SETup:TABLe:NCHannels?

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:TABLe:NCHannel?`

This command queries the number of channels being used for the carrier.

***RST** 1

Choices N/A

Key Entry N/A

Remarks N/A

:LINK:DOWN:SETup:TABLe:PADJust

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:SETup:TABLe:PADJust EQUal|SCALe`

This command sets the code domain power.

EQUal This choice will adjust all channel powers to have equal energy per symbol, referenced to 7.5 ksps and increasing by 3 dB for each doubling of the symbol rate.

SCALe This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

***RST** N/A

Choices EQUal SCALe

Key Entry **Equal Energy per Symbol** **Scale To 0dB**

Remarks This command is available in downlink only.

:LINK:DOWN:TFCI

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:TFCI ON|OFF|1|0`
`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:DOWN:TFCI?`

This command enables or disables the transport format combination indicator (TFCI) field for all channels.

***RST** 1

Choices ON OFF 1 0

Key Entry **TCFI Field Off On**

Remarks N/A

:LINK:UP:OACP

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:OACP ADJ|ALT`
`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:OACP?`

This command selects the channel power optimization type for any uplink channel W-CDMA setup.

ADJ This choice optimizes for adjacent channel power.

ALT This choice optimizes for alternate channel power.

***RST** ADJ

Choices ADJ ALT

Key Entry **Optimize ACP ADJ ALT**

Remarks This command is only operational for any uplink channel W-CDMA setup.

To change the current W-CDMA setup information, refer to ":LINK:UP:SETup" on page 767.

:LINK:UP:SCRAMBLE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SCRAMBLE <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SCRAMBLE?
```

This command sets the scramble code for the uplink.

***RST** #H000000

Range #H0–FFFFFFF

Key Entry **Scramble Code**

Remarks N/A

:LINK:UP:SDPDch

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SDPDch I|Q
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SDPDch?
```

This command selects whether the second dedicated physical data channel (SDPDCH) will be put onto I or Q.

***RST** Q

Choices I Q

Key Entry **Second DPDCH I Q**

Remarks N/A

:LINK:UP:SETup

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup DPCCH|DDPDCH1|DDPDCH2|
DDPDCH3|DDPDCH4|DDPDCH5|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup?
```

This command selects a dedicated physical control channel (DPCCH) for uplink with the option to add one or more dedicated physical data channel (DPDCH) or a previously stored setup.

DPCCH	This choice selects 1 dedicated physical control channel.
DDPDCH1	This choice selects 1 dedicated physical control channel and 1 dedicated physical data channel.
DDPDCH2	This choice selects 1 dedicated physical control channel and 2 dedicated physical data channel.
DDPDCH3	This choice selects 1 dedicated physical control channel and 3 dedicated physical data channel.
DDPDCH4	This choice selects 1 dedicated physical control channel and 4 dedicated physical data channel.
DDPDCH5	This choice selects 1 dedicated physical control channel and 5 dedicated physical data channel.

***RST** DPCCH

Choices DPCCH DDPDCH1 DDPDCH2 DDPDCH3 DDPDCH4 DDPDCH5 "<file name>"

Key Entry **DPCCH** **DPCCH + 1 DPDCH** **DPCCH + 2 DPDCH** **DPCCH + 3 DPDCH** **DPCCH + 4 DPDCH** **DPCCH + 5 DPDCH** **Custom WCDMA State**

Remarks Refer to “File Name Variables” on page 14 for information on the file name syntax.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:LINK:UP:SETup:TABLe:APPLy” on page 768.

:LINK:UP:SETup:STORe

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:STORe "<file name>"`

This command stores the current state into a designated file name.

***RST** N/A

Range N/A

Key Entry **Store To File**

Remarks You can recall a saved state from signal generator memory (non-volatile) by executing the following commands (using a designated file name):

For downlink, refer to ":LINK:DOWN:SETup" on page 753.

For uplink, refer to ":LINK:UP:SETup" on page 767.

Refer to "File Name Variables" on page 14 for information on the file name syntax.

:LINK:UP:SETup:TABLe:APPLy

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:TABLe:APPLy`

This command applies the signal based on the current values in the W-CDMA channel setup table editor.

***RST** N/A

Range N/A

Key Entry **Apply Channel Setup**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:LINK:UP:SETup:TABLe:CHANnel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:TABLe:CHANnel
INIT|APPend|<chan_num>,<chan_type>,<symbol_rate>,<spread_code>,
<power>,<TFCI>,<TCP>,RANDom|<data_val>,<fbi_bits_count>,<fbi_bits_value>
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:TABLe:CHANnel? <chan_num>
```

This command defines the channel parameters of the signal.

Use INIT to clear the table editor and define the parameters for the first channel; use APPend to add new channels. To edit an existing channel, use its channel number <chan_num>.

The variable <power> is expressed in units of decibels (dB).

The channel type, symbol rate, spread code, power, TFCI value, TPC value, data value, FBI bit count, and FBI bit value are returned when a query is initiated. The output format is as follows:

```
<chan_type>,<symbol_rate>,<spread_code>,<power>,<TFCI>,<TCP>,<data_val>,
<fbi_bits_count>,<fbi_bits_value>
```

INIT	This choice clears the current information and creates a new one-row table, allowing for further definition using additional parameters.
APPend	This choice adds a row to an existing table.
RANDom	This choice selects random data format for the digital modulation signal.
<fbi_bits_count>	This variable sets the number of feedback information (FBI) bits.
<fbi_bits_value>	This variable sets the value of the FBI bits.

***RST** *<chan_type>:* DPCH *<symbol_rate>:* +1.50000000E+
<spread_code>: +0 *<power>:* +0.00000000E+000 *<TFCI>:* +0
<TPC>: #H5555 *<data_val>:* RAND *<FBI Bits Count:* +0
<FBI Bit Count: +0

Range *<power>:* –40 to 0 *<data_val>:* 00000000–11111111
<fbi_bits_count>: 0–2 *<fbi_bits_value>:* 0–3

<symbol_rate>	*<spread_rate>*
7.5 ksps	0–511
15 ksps	0–255

<*symbol_rate*>	<*spread_rate*>
30 ksps	0–127
60 ksps	0–63
120 ksps	0–31
240 ksps	0–15
480 ksps	0–7
960 ksps	0–3

Choices INIT APPend <chan_num> <chan_type> symbol_rate <spread_code> <power> TFCI TCP RANDom <data_val> <fbi_bits_count> <fbi_bits_value>

Key Entry **Channel Type Symbol Rate First Spread Code Power Spread Code TFCI Field Off On Scramble Code Scramble Offset Random**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":LINK:UP:SETup:TABLe:APPLy" on page 768.

:LINK:UP:SETup:TABLe:GUNit

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:TABLe:GUNit DB|LINear|INDex
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:TABLe:GUNit?
```

This command selects the uplink power measurement units.

DB	The power is set in decibels-exponential.
LINear	The power is set to increase linearly.
INDex	The power is set at an index level - steps.

***RST** DB

Choices DB LINear INDex

Key Entry **Gain Unit dB Lin Index**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":LINK:UP:SETup:TABLe:APPLy" on page 768.

:LINK:UP:SETup:TABLe:NCHannel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:SETup:TABLe:NCHannels?
```

This command queries the setup table for the number of uplink channels.

***RST** 1

Choices N/A

Key Entry N/A

Remarks N/A

:LINK:UP:TFCI

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:TFCI ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP:ARB:LINK:UP:TFCI?
```

This command enables or disables the transport format combination indicator (TFCI) field for all channels in the table.

***RST** 1

Choices ON OFF 1 0

Key Entry **TCFI Field Off On**

Remarks N/A

:REFerence:EXTernal:FREQuency

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:REFerence:EXTernal:FREQuency <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:REFerence:EXTernal:FREQuency?
```

This command sets the external reference frequency.

The variable <val> is expressed in Hertz (Hz).

***RST** +1.00000000E+007

Range 2.5E5–1E8

Key Entry **Reference Freq**

Remarks The value specified by this command is effective only when you are using an external ARB reference applied to the BASEBAND GEN REF IN rear panel connector.

To specify external as the ARB reference source type, refer to ":REFerence[:SOURce]" on page 772.

:REFerence[:SOURce]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:REFerence[:SOURce] INTernal|EXTernal
[:SOURce]:RADio:WCDMa:TGPP:ARB:REFerence[:SOURce]?
```

This command selects either an internal or external reference for the waveform clock.

***RST** 0

Choices INTernal EXTernal

Key Entry **ARB Reference Ext Int**

Remarks If the EXTernal choice is selected, the external frequency value must be entered and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":REFerence[:SOURce]" on page 772 to enter the external reference frequency.

:RETRigger

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:RETRigger ON|OFF|IMMediate
[:SOURce]:RADio:WCDMa:TGPP:ARB:RETRigger?
```

This command sets the retrigger mode.

ON This choice specifies that if a trigger occurs while a waveform is initiated, the waveform will retrigger at the end of the previous waveform sequence and play once more.

OFF This choice specifies that if a trigger occurs while a waveform is initiated, the action will be ignored.

IMMediate This choice specifies that if a trigger occurs while a waveform is playing, the waveform will reset and replay from the start immediately upon receiving a trigger.

***RST** 0

Choices ON OFF IMMediate

Key Entry **Retrigger Mode Off On**

Remarks N/A

:REVision

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:REVision?
```

This command checks the version for the arbitrary waveform generator firmware.

***RST** 3GPP 06-2001

Choices N/A

Key Entry N/A

Remarks N/A

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger:CONTinuous[:TYPE] FREE|
TRIGger|RESet
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger:CONTinuous[:TYPE]?
```

This command sets the trigger type.

FREE This choice immediately transmits a waveform that is continuously repeated.

TRIGger This choice causes the waveform to wait for a trigger. Once a trigger is received, the transmission of a continuously repeated waveform begins.

RESet This choice immediately restarts a continuously repeated waveform upon receiving a trigger.

***RST** FREE

Choices FREE TRIGger RESet

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

Remarks To select CONTinuous as the trigger type, refer to ":TRIGger:TYPE" on page 774.

:TRIGger:TYPE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger:TYPE CONTinuous|SINGLE|GATE
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger:TYPE?
```

This command sets the arbitrary waveform trigger type.

CONTinuous	The waveform repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 773.
SINGle	The waveform segment or sequence plays once for every trigger received.
GATE	An external trigger signal interrupts a segment's playback. The active level can be set high or low when the external signal returns to the active state of the playback. To change the polarity of the gated trigger, refer to":TRIGger:TYPE:GATE:ACTive" on page 774.

***RST** CONT

Choices CONTinuous SINGle GATE

Key Entry **Continuous** **Single** **Gated**

Remarks N/A

:TRIGger:TYPE:GATE:ACTive

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger:TYPE:GATE:ACTive?
```

This command sets the arb trigger gate polarity; GATE must first be selected as the trigger type.

LOW	This choice outputs a trigger signal when the signal level at the PATT TRIG IN rear panel connector is in a low state.
HIGH	This choice outputs a trigger signal when the signal level at the PATT TRIG IN rear panel connector is in a high state.

***RST** HIGH

Choices LOW HIGH

Key Entry **Gate Active Low High**

Remarks To select a GATE as the trigger type, refer to ":TRIGger:TYPE" on page 774.

:TRIGger[:SOURce]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]?
```

This command sets the trigger source.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 776.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

Choices KEY EXT BUS

Key Entry **Trigger Key** **Bus** **Ext**

Remarks N/A

:TRIGger[:SOURce]:EXTernal:DELay

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal:DELay?
```

This command sets the arbitrary waveform generator's external trigger delay.

The variable <val> is expressed in units of seconds (µsec–ksec).

***RST** +1.00000000E–003

Range 1E–8 to 4E1

Key Entry **Ext Delay Time**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 775.

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal:DELay:
STATe ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the arbitrary waveform generator's external trigger delay.

***RST** 0

Choices ON OFF 1 0

Key Entry **Ext Delay Off On**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 775.

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal:
SLOPe POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity for the external trigger.

***RST** NEG

Choices POSitive NEGative

Key Entry **Ext Polarity Neg Pos**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 775.

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal
[:SOURce] EPT1|EPT2|EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:WCDMa:TGPP:ARB:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command specifies which PATT TRIG IN connection, rear panel connector or AUX

I/O connector, will be used to accept an externally applied trigger signal.

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATT TRIG IN rear panel connector for the external signal connection.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear panel AUX I/O connector for the external signal connection.

***RST** EPT1

Choices EPT1 EPT2 EPTRIGGER1 EPTRIGGER2

Key Entry **Patt Trig In 1** **Patt Trig In 2**

Remarks This command is effective only if an external trigger is selected as the trigger source. Refer to ":TRIGger[:SOURce]" on page 775.

For more information about the rear panel AUX I/O connector pin configuration, refer to the *User's Guide*.

[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP:ARB[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP:ARB[:STATe]?
```

This command enables or disables the W-CDMA modulation format.

ON (1) This choice enables the W-CDMA modulation capability and sets up the internal hardware to generate the currently selected W-CDMA signal selection.

OFF (0) This choice disables the W-CDMA baseband signal capability.

***RST** 0

Choices ON OFF 1 0

Key Entry **W-CDMA Off On**

Remarks This choice also activates the I/Q state and sets the I/Q source to internal.

Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP[:BBG])

:BBCLock

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:BBCLock?
```

This command selects the baseband generator chip clock source for the radio channel.

***RST** INT

Choices INT[1] EXT[1]

Key Entry **BBG Chip Clock Ext Int**

Remarks Refer to ":BBCLock:EXT:RATE" on page 779 for the EXT input clock rate selections.

:BBCLock:EXT:RATE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:BBCLock:EXT:RATE X1|X2|X4
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:BBCLock:EXT:RATE?
```

This command sets the external clock rate for the baseband generator.

X1 This choice sets an input clock rate that is identical to the chip clock (3.84 MHz).

X2 This choice sets an input clock rate than is two times the rate of the chip clock.

X4 This choice sets an input clock rate that is four times the rate of the chip clock.

***RST** X1

Choices X1 X2 X4

Key Entry **Ext Clock Rate x1 x2 x4**

Remarks This command only applies to uplink.

:DLINk:APPLy

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:APPLy
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:APPLy?
```

This command immediately starts the channel coding generation process according to the channel setup and data entered for the downlink physical and transport channels.

***RST** N/A

Range N/A

Key Entry **Apply Channel Setup**

Remarks If pre-computing is required, then a progress bar will appear on the signal generator's display.

:DLINk:AWGN:CN

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:CN <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:CN?
```

This command sets the in band carrier to noise ratio (C/N) value in the AWGN carrier to noise.

***RST** –10.2

Range –20 to 20

Field Entry `C/N value`

Remarks N/A

:DLINk:AWGN:CPower

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:CPower?
```

This query returns the carrier power of the RF signal.

***RST** 0

Range N/A

Field Entry `C Power`

Remarks N/A

:DLINk:AWGN:ECNO

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:ECNO <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:ECNO?
```

This command sets the Ec/No value of the Ec Ref channel.

The variable <val> is expressed in decibels (dB).

***RST** 0

Range –30 to 30

Field Entry `Ec/No value`

Remarks N/A

:DLINk:AWGN:ECRPower

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:ECRPower?
```

This query returns the carrier noise power in the Ec Ref channel.

***RST** 0

Range N/A

Field Entry `Ec Ref Power`

Remarks N/A

:DLINk:AWGN:ECRef

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:ECRef DPCH1|DPCH2|PCCPCH|
PICH|CPICH
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:ECRef?
```

This command selects the reference used for the Ec/No value.

DPCH1 This choice selects 1 dedicated physical channel.

DPCH2 This choice selects 2 dedicated physical channel.

PCCPCH	This choice selects a primary command control physical channel.
PICH	This choice selects a paging indicator channel.
CPICH	This choice selects a common pilot channel.

***RST** DPCH1

Choices DPCH1 DPCH2 PCCPCH PICH CPICH

Key Entry **DPCH + 1** **DPCH + 2** **PCCPCH** **PICH** **CPICH**

Remarks White noise is a frequency spectrum that is uniform over a specific frequency band. White noise has equal power per hertz over the specific frequency band.

:DLINk:AWGN:FNBW

Supported All with Option 400 and 403

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:FNBW?`

This query returns the flat noise bandwidth value.

***RST** +6.1440000E+006

Range N/A

Key Entry N/A

Remarks N/A

:DLINk:AWGN:NPower

Supported All with Option 400 and 403

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:NPower?`

This query returns the in-band noise power portion of the total RF power.

***RST** +0

Range N/A

Key Entry N/A

Remarks N/A

:DLINk:AWGN[:STATe]

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:STATe ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:AWGN:STATe?
```

This command enables or disables the additive white gaussian noise (AWGN) physical channel.

***RST** 0

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks N/A

:DLINk:BBCLock

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:BBCLock?
```

This command selects the baseband generator chip clock source for the channel.

***RST** INT

Choices INT[1] EXT[1]

Key Entry **BBG Data Clock Ext Int**

Remarks N/A

:DLINk:CARB:CMODe:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:CCODe?
```

This command sets the channel code for the chip ARB based dedicated physical channel (DPCH) in compressed mode.

***RST** 6

Range 0–511

Field Entry Channel Code

Remarks N/A

:DLINk:CARB:CMODe:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:
DATA PN9|PN15
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:DATA?
```

This command sets the data pattern for the dedicated physical channel (DPCH) in compressed mode (CM).

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks The data pattern contains one frame of each normal DPCH frame with a chosen slot structure. CM is enabled via spread factor reduction using a single frame method.

:DLINk:CARB:CMODe:FOFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:FOFFset <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:FOFFset?
```

This command sets the frame offset for the dedicated physical channel (DPCH) in compressed mode.

***RST** 0

Range 0–149

Field Entry `Frame Offset`

Remarks N/A

:DLINk:CARB:CMODe:FSTRuct

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:FSTRuct A|B
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:FSTRuct?
```

This command selects the frame structure for the downlink compressed mode.

A This choice maximizes the transmission gap length in a compressed frame.

B This choice optimized for power control during a compressed frame.

***RST** A

Choices A B

Key Entry **A** **B**

Remarks N/A

:DLINk:CARB:CMODe:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:POWer?
```

This command sets the power for the downlink compressed mode.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

Remarks N/A

:DLINk:CARB:CMODe:PRATio

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:PRATio <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:PRATio?
```

This command sets the playback ratio for the downlink compressed mode.

***RST** 2

Range 0–4096

Field Entry `Playback Ratio`

Remarks The value that is set represents the number of normal frames played between each compressed frame.

For example: 1:30

30 represents the uncompressed (normal) DPCH frames. The 30

frames will be played and then 1 compressed DPCH frame. The sequence then repeats.

:DLINk:CARB:CMODe:SCTYpe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:
SCTYpe NORMal|RIGHt|LEFT
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:SCTYpe?
```

This command sets the scramble type for the downlink compressed mode.

NORMal	This choice selects scramble codes 0–8191 (16x511+15=8191).
RIGHt	This choice selects scramble codes 8192–16383 (Normal+8192).
LEFT	This choice selects scramble codes 16384–24575 (Normal+16384).

***RST** NORM

Choices NORMal RIGHt LEFT

Key Entry **Normal** **Right** **Left**

Remarks N/A

:DLINk:CARB:CMODe:SFORmat

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:SFORmat <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:SFORmat?
```

This command sets the slot format value for the dedicated physical channel (DPCH) in compressed mode. This value is used for both compressed and uncompressed frames.

***RST** +11

Range 1–15

Field Entry `Slot Format`

Remarks N/A

:DLINk:CARB:CMODe:SSCodeos

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:SSCodeos <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:SSSCodeos?
```

This command sets the secondary scramble code offset for the dedicated physical channel (DPCH) in compressed mode.

***RST** +0

Range 0–15

Field Entry SecScr Code OS

Remarks N/A

:DLINk:CARB:CMODe:TFIRst

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:TFIRst <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:TFIRst?
```

This command sets the first slot at which a gap appears.

***RST** 7

Range 0–7

Field Entry Tfirst

Remarks N/A

:DLINk:CARB:CMODe:TGL

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:TGL <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:TGL?
```

This command sets the number of slots in the gap.

***RST** 7

Range 1–7

Field Entry Tgl

Remarks N/A

:DLINk:CARB:CMODe[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe[:STATe]?
```

This command enables or disables the downlink dedicated physical channel (DPCH) in compressed mode.

***RST** 0

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks N/A

:DLINk:CPICh:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CPICh:CCODe?
```

This query returns the common paging indicator channel (CPICH) channel code value.

***RST** +0

Range N/A

Key Entry N/A

Remarks The channelization code is always expected to be 0.

:DLINk:CPICh:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CPICh:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CPICh:POWer?
```

This command sets the power level for the common paging indicator channel (CPICH).

The variable <val> is expressed in units of decibels (dB).

***RST** –3.30000000E+000

Range –40 to 0

Field Entry Power

Remarks N/A

:DLINk:CPICh[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CPICh[:STATe]
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CPICh[:STATe]?
```

This command enables or disables the common paging indicator channel (CPICH).

***RST** 1

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks N/A

:DLINk:CRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CRATe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CRATe?
```

This command adjusts the chip rate.

The variable <val> is expressed in units of cycle per second (cps).

***RST** +3.84000000E+006

Range 1000–4250000

Field Entry `Chip Rate`

Remarks The chip rate is equivalent to the spreading rate.

:DLINk:DPCH[1]:BALance

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]:BALance <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]:BALance?
```

This command sets DPCH1 power while scaling the power of all available OCNS channels in order to maintain a total power of 0 dB.

The variable <val> is expressed in units of decibels (dB).

***RST** N/A

Range N/A

Key Entry **DPCH Channel Balance**

Remarks At least one DPCH and one OCNS channel must be on prior to channel balancing. Refer to ":DLINk:DPCH[1]|2[:STATe]" on page 797 and ":DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe]" on page 803.

The command `[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]:BINitialize` must be initiated prior to channel balancing.

:DLINk:DPCH[1]:BINitialize

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]:BINitialize`

This command initializes the DPCH1 or DPCH2 power of the OCNS channel balancing.

***RST** N/A

Range N/A

Key Entry N/A

Remarks To insure proper balancing, this command must be called before the channel balancing.

:DLINk:DPCH[1]|2:ALL[:STATe]

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:ALL[:STATe] ON|OFF|1|0`

This command enables or disables both of the downlink dedicated physical channels.

***RST** N/A

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to ":DLINk:APPLy" on page 780.

To query the state of the individual channel, refer to ":DLINk:DPCH[1]|2[:STATe]" on page 797

:DLINk:DPCH[1]|2:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:CCODe?
```

This command sets the downlink dedicated physical channel (DPCH) code number.

***RST** *DPCH 1*: 10 *DPCH 2*: 11

Range 0–511

Field Entry Chan Code

Remarks The channel code is coupled with the slot format and symbol rate. Refer to ":DLINk:DPCH[1]|2:SLOTformat" on page 794 and ":DLINk:DPCH[1]|2:SRATe" on page 794.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA PN9|PN15|FIX4|
"<file name>"|TGRA|TGRB
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA?
```

This command configures the data pattern for the downlink dedicated physical channel (DPCH).

TGRA	This choice selects transport channel A.
TGRB	This choice selects transport channel B.
"<file name>"	This variable specifies a data pattern that has been stored in memory.

***RST** PN9

Choices PN9 PN15 FIX4 "<file name>" TGRB TGRB

Key Entry **PN9 PN15 FIX4 "User File" Transp Chan A Transp Chan B**

Remarks The data is now independent, on each of the DPCH channels. The data

is limited to PN9 and PN15 when the DPCH is in slot format 16.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA:FIX4?
```

This command sets the data type to a FIX4 pattern for the downlink dedicated physical channel (DPCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range: 0–15

Key Entry FIX4

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA:POWer?
```

This command sets the power level for the downlink dedicated physical channel (DPCH).

The variable <val> is expressed in units of decibels (dB).

***RST** –1.02000000E+001

Range: –40 to 0

Field Entry Power

Remarks N/A

:DLINK:DPCH[1]|2:RCSetup

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]|2:RCSetup REF122|REF64|
REF144|REF384|AMR122|ISDN
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]|2:RCSetup?
```

This command configures the downlink reference measurement setup for the transport channel.

REF122	This choice configures the transport channel per the 3G TS 25.101 specification to a downlink reference measurement channel 12.2 kbps rate.
REF64	This choice configures the transport channel per the 3G TS 25.101 specification to a downlink reference measurement channel 64 kbps rate.
REF144	This choice configures the transport channel per the 3G TS 25.101 specification to a downlink reference measurement channel 144 kbps rate.
REF384	This choice configures the transport channel per the 3G TS 25.101 specification to a downlink reference measurement channel 384 kbps rate.
AMR122	This choice configures the transport channel per the 3G TS 25.944 specification to a downlink reference measurement channel AMR 12.2 kbps rate.
ISDN	This choice configures the transport channel as follows: 64 kbps rate, channel 1 with 4 blocks of 640 and channel 2 with 1 block of 148.

***RST** N/A

Choices REF122 REF64 REF144 REF384 AMR122 UDI64 ISDN

Key Entry

12.2 kbps (25.101 v3.7)	**64 kbps (25.101 v3.7)**	**144 kbps (25.101 v3.7)**	**384 kbps (25.101 v3.7)**
AMR 12.2 (25.944 v3.5)	**UDI ISDN (25.944 v3.5)**		

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:SLOTformat

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA:SLOTformat <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:DATA:SLOTformat?
```

This command configures the slot format for the dedicated physical channel (DPCH).

***RST** 0

Range: 0–16

Field Entry Slot Format

Remarks The slot format is coupled with the channel code and symbol rate. The transmit power control (TPC), the transport format combination indicator (TFCI), and the Pilot bits are also set as per specification and not displayed.

For a description of slot formats, see the 3GPP Technical Specifications (TS 25.211 v3.7).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:SRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:SRATe?
```

This query returns the symbol rate for the downlink dedicated physical channel.

***RST** +7.50000000E+003

Range: N/A

Key Entry N/A

Remarks N/A

:DLINk:DPCH[1]|2:SSCodeos

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:SSCodeos <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:SSCodeos?
```

This command sets the secondary scrambling code offset for the downlink dedicated physical channel (DPCH).

***RST** +0

Range: 0–15

Field Entry `2nd Scr Offset`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:TFCI:PATTern

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TFCI:PATTern <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TFCI:PATTern?
```

This command sets a 10-bit pattern for the transport format combination indicator (TFCI) for the dedicated physical channel (DPCH).

While the variable <val> is expressed in binary or decimal formats, the query returns only decimal values.

***RST** +0

Range: 0–1023

Field Entry `TFCI Pat`

Remarks The TFCI is optional and describes the services in use (for example, voice or data).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:TOFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TOFFset <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TOFFset?
```

This command adjusts the timing offset for the dedicated physical channel (DPCH).

The variable <val> is expressed in chips.

***RST** +0

Range: 0–149

Field Entry `tDPCH Offset`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:TPC:NUMSteps

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TPC:NUMSteps <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TPC:NUMSteps?
```

This command sets the number of steps for increasing/decreasing the user's equipment (UE) power.

***RST** +1

Range: 1–80

Field Entry `TPC Steps`

Remarks The command is used with the transmit power control (TPC) patterns up/down (UDOWn), down/up (DUP), all down(DALL), all up (UALL), external (EXT), or user file (<"file name">. Refer to ":DLINk:DPCH[1]|2:TPC:PATTern" on page 796

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2:TPC:PATTern

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TPC:PATTern UDOWn|DUP|
UALL|DALL|EXT|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TPC:PATTern?
```

This command controls the power of the user's equipment (UE). The increase/decrease direction for UE power level changes is determined by the transmit power control (TPC) pattern.

UDOWn This choice repetitively steps up and down the TPC pattern.

DUP	This choice repetitively steps down and up the TPC pattern.
UALL	This choice consecutively steps up the TPC pattern.
DALL	This choice consecutively steps down the TPC pattern.
EXT	This choice specifies an external TPC pattern.

***RST** UDOW

Choices UDOWn DUP UALL DALL EXT "<file name>"

Key Entry **All Down** **All Up** **Down/Up** **Up/Down** **Ext** **User File**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk:DPCH[1]|2[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:ALL[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:ALL[:STATe]?
```

This command enables or disables the dedicated physical channels (DPCH1 or DPCH2).

***RST** *DPCH1*: 1 *DPCH2*: 0

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to ":DLINk:APPLy" on page 780.

:DLINk:FILTer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer RNYQuist|NYQuist|GAUSsian|
RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<User FIR>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer?
```

This command selects the filter type for the downlink configuration.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter

(above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD — This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ — This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

UGGaussian — This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

AC4Fm — This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

"<User FIR>" — This variable is any filter file that you have stored into memory.

***RST** RNYQ

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<User FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:DLINk:FILTer:ALPHa

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:ALPHa <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:ALPHa?
```

Execute this command to change the alpha value for a Nyquist or root Nyquist filter.

***RST** +2.20000000E–001

Range 0–1

Key Entry **Filter Alpha**

Remarks This command is effective only after selection of a root Nyquist or Nyquist filter; it does not affect other types of filters. To change the current filter type, refer to ":DLINk:FILTer" on page 797.

:DLINk:FILTer:BBT

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:BBT <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:BBT?
```

Execute this command to change the bandwidth-multiplied-by-bit-time filter parameter value.

***RST** +5.00000000E–001

Range 0.0000–1.0

Key Entry **Filter BbT**

Remarks This command is effective only after selection of a Gaussian filter; it does not affect other types of filters. To change the current filter type, refer to ":DLINk:FILTer" on page 797.

:DLINk:FILTer:CHANnel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:CHANnel EVM|ACP
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:CHANnel?
```

Execute this command to optimize a filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection. This feature only applies to root Nyquist and Nyquist filters.

***RST** EVM

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":DLINk:FILTer" on page 797.

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:ALL[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:ALL[:STATe] ON|OFF|1|0
```

This command enables or disables all of the orthogonal channel noise simulator (OCNS) channels.

***RST** +0

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks To query the state of the individual channel, refer to ":DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe]" on page 803.

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:CCODE?
```

This command sets the channel code number for the downlink orthogonal channel noise simulator (OCNS).

***RST** +24

Range 0–255

Field Entry Chan Code

Remarks The channel code is coupled with the symbol rate. Refer to ":DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SRATe" on page 802.

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:DATA PN9|PN15
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:DATA?
```

This command configures the data pattern for the downlink orthogonal channel noise simulator (OCNS).

***RST** PN9

Choices PN9 PN15

Key Entry **PN9** **PN15**

Remarks N/A

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:POWer?
```

This command sets the power level for the orthogonal channel noise simulator (OCNS).

The variable <val> is expressed in units of decibels (dB).

***RST** –1.200000000E+001

Range –40 to 0

Field Entry `Power`

Remarks N/A

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:SRATe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:SRATe?
```

This command selects the symbol rate for the orthogonal channel noise simulator (OCNS).

The choices are expressed in units of kilo symbols per second (ksps).

***RST** +1.50000000E+004

Choices <*val*>: 7.5E3 15E3 30E3 60E3 120E3 240E3 480E3 960E3

Key Entry **7.5 ksps** **15 ksps** **30 ksps** **60 ksps** **120 ksps** **240 ksps** **480 ksps** **960 ksps**

Remarks The symbol rate is coupled with the channel code. Refer to ":DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:CCODe" on page 800.

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCodeos

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:SSCodeos <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:SSCodeos?
```

This command sets the secondary scrambling code offset for the orthogonal channel noise simulator (OCNS).

***RST** +0

Range 0–15

Field Entry `2nd Scr Offset`

Remarks N/A

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:TOFFset <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16:TOFFset?
```

This command adjusts the timing offset for the orthogonal channel noise simulator (OCNS) channel.

***RST** +0

Range: 0–149

Field Entry `tOCNS Offset`

Remarks N/A

:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16[:STATe]?
```

This command enables or disables the orthogonal channel noise simulator (OCNS) channel.

***RST** +0

Choices ON OFF 1 0

Field Entry `On/Off`

Remarks N/A

:DLINk:PADJust

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PADJust EQUal|SCALe
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PADJust?
```

This command adjusts the code domain power levels of all downlink channels.

EQUal This choice will adjusts all channel powers to equal power settings.

SCALe This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

***RST** EQU

Choices EQUal SCALe

Key Entry **Equal Powers** **Scale To 0dB**

Remarks N/A

:DLINk:PCCPch:BCHData

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:BCHData PN9|PN15|FIX4|
"<file name>"|TRANspch
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:BCHData?
```

This command sets the broadcast channel (BCH) data format that will be transmitted on the physical common control physical channel (PCCPCH).

TRANspch This choice selects a dedicated transport channel data pattern.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX4

Choices PN9 PN15 FIX4 "<file name>" TRANspch

Key Entry **PN9** **PN15** **FIX4** **User File** **Transport CH**

Remarks N/A

:DLINk:PCCPch:BCHData:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:BCHData:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:BCHData:FIX4?
```

This command sets a fixed 4-bit data pattern for the primary common control physical channel (PCCPCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Key Entry FIX4

Remarks N/A

:DLINk:PCCPch:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:CCODe?
```

This command sets the primary common control physical channel (PCCPCH) code to the desired code number.

***RST** +1

Range 0–255

Field Entry Channel Code

Remarks N/A

:DLINk:PCCPch:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch:POWer?
```

This command sets the power level for the primary common control physical channel (PCCPCH).

The variable <val> is expressed in units of decibels (dB).

***RST** –5.30000000E+000

Range –40 to 0

Field Entry Power

Remarks N/A

:DLINk:PCCPch[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PCCPch[:STATe]?
```

This command enables or disables the primary common control physical channel (PCCPCH).

***RST** 1

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks N/A

:DLINk:PICH:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:CCODe?
```

This command sets the paging indicator channel (PICH) code to the desired code number.

***RST** +3

Range 0–255

Field Entry Channel Code

Remarks N/A

:DLINk:PICH:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:DATA PN9|PN15|FIX4|
"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:DATA?
```

This command configures the data pattern for the downlink paging indicator channel (PICH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9

Choices PN9 PN15 FIX4 "<file name>"

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks N/A

:DLINk:PICH:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:DATA:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:DATA:FIX4?
```

This command sets a fixed 4-bit data pattern to be transmitted on a paging indicator channel (PICH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Key Entry **FIX4**

Remarks N/A

:DLINk:PICH:PIBits

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:PIBits?
```

This query returns the number of bits in the paging indicator field.

***RST** +288

Range N/A

Field Entry `PI Bits`

Remarks N/A

:DLINk:PICH:PINDicator

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:PINDicator?
```

This query returns the number of paging indicator fields per frame.

***RST** +144

Range N/A

Field Entry Paging Indicator

Remarks N/A

:DLINk:PICH:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:POWer?
```

This command sets the power level of the paging indicator channel (PICH).

The variable <val> is expressed in units of decibels (dB).

***RST** –8.300000000E+000

Range –40 to 0

Field Entry Power

Remarks N/A

:DLINk:PICH[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH[:STATe]?
```

This command enables or disables the paging indicator channel (PICH).

***RST** 0

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks N/A

:DLINk:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:POLarity NORMal|INVverted
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:POLarity?
```

This command selects the phase polarity of the downlink signal.

NORMal This choice selects normal polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Phase Polarity Normal Invert**

Remarks N/A

:DLINk:PSCH:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PSCH:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PSCH:POWer?
```

This command sets the power level for the primary synchronization physical channel (PSCH).

The variable <val> is expressed in units of decibels (dB).

***RST** –8.30000000E+000

Range –40 to 0

Field Entry `Power`

Remarks N/A

:DLINk:PSCH[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PSCH[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PSCH[:STATe]?
```

This command enables or disables the primary synchronization physical channel (PSCH).

***RST** 1

Choices ON OFF 1 0

Field Entry PSCH State

Remarks N/A

:DLINk:SCH[:STATe]

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SCH[:STATe] ON|OFF|1|0`

This command enables or disables the primary and secondary synchronization channel (SSCH).

***RST** 1

Choices ON OFF 1 0

Key Entry Channel State Off On

Remarks To query the state of the individual channel, refer to ":DLINk:PSCH[:STATe]" on page 809 and ":DLINk:SSCH[:STATe]" on page 811.

:DLINk:SCRamblecode

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SCRamblecode <val>`
`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SCRamblecode?`

This command selects the scramble code number.

***RST** +0

Range 0–511

Field Entry Scrambling Code

Remarks N/A

:DLINk:SSCH:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SSCH:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SSCH:POWer?
```

This command sets the power level for the secondary synchronization channel (SSCH).

The variable <val> is expressed in units of decibels (dB).

***RST** –8.30000000E+000

Range –40 to 0

Field Entry SSCH Power

Remarks N/A

:DLINk:SSCH:SSGRoup

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SSHC:SSGRoup?
```

This command query returns the secondary scramble code group for the secondary synchronization channel (SSCH).

***RST** +0

Range N/A

Field Entry SSCH 2nd Scramble Group

Remarks N/A

:DLINk:SSCH[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:SSCH[:STATe] ON|OFF|1|0
```

This command enables or disables the secondary synchronization channel (SSCH).

***RST** 1

Choices ON OFF 1 0

Field Entry SSCH State

Remarks N/A

:DLINk:TSETup

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:TSETup REFSensitiv|MAXinput|ACS|BLOCking|SPURious|INTermod|PERFreq`

This command configures the test setup for the downlink channels.

`REFSensitivity`	This choice selects reference sensitivity. This is the minimum receiver input power measured at the antenna connector.
`MAXinput`	This choice selects maximum input interference. The receiver is stressed with high-levels of interference from unwanted signals.
`ACS`	This choice selects adjacent channel selectivity (ACS). This is the receiver ability to receive a wanted signal at the assigned channel frequency with the presence of adjacent signals. ACS is the ratio of the receiver filter attenuation (on the assigned channel) to the receive filter attenuation on the adjacent channel(s).
`BLOCking`	This choice selects the blocking characteristics. This is a measure of the receiver ability to receive a wanted signal at the assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels.
`SPURious`	This choice selects spurious emission power. The emissions are generated or amplified by a receiver.
`INTermod`	This choice selects intermodulation. Third order intermodulation (TIO) or higher mixing of the two interfering RF signals signal in the band of the desired channel.
`PERFreq`	This choice selects the performance requirement of the dedicated channel. This is a static propagation conditions that is determined by the maximum block error rate (BLER) allowed when the receiver input signal is at a specified E_b/N_o limit.

***RST** N/A

Choices `REFSensitivity` `MAXinput` `ACS` `BLOCking` `SPURious` `INTermod` `PERFreq`

Key Entry **Ref Sensitivity** **Max Input** **ACS** **Blocking** **Spurious Response** **Intermod** **Performance Req**

Remarks N/A

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BLKSize

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
BLKSize <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
BLKSSize?
```

This command sets the coupling block size for the selected dedicated transport channel (DCH).

***RST** 20

Range 0–5000

Field Entry `Blk Size`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BPFRame

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
BPFRame?
```

This query returns the block per frame for the selected dedicated transport channel (DCH).

***RST** 20

Range N/A

Key Entry N/A

Remarks N/A

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
BRATe?
```

This query returns the block rate for the selected dedicated transport channel (DCH).

***RST** 20

Range N/A

Key Entry N/A

Remarks N/A

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BSSize

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
BSSize <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
BSSize?
```

This command sets the coupling block set size for the selected dedicated transport channel (DCH).

***RST** 20

Range 0–5000

Key Entry **Blk Size**

Remarks This value is only used when the DCH positioning is “fixed”.

To change the DCH positioning, refer to “:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:POSition” on page 817.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINk:APPLy” on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:CODE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
CODE HCONv|TCONv|TURBo|NONE
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
CODE?
```

This command selects the encoder type.

HCONv This choice selects coding with the 1/2 rate convolutional encoder.

TCONv This choice selects coding with the 1/3 rate convolutional encoder.

TURBo This choice selects coding with the turbo coder.

NONE This choice selects no coding.

***RST** HCON

Choices HCONv TCONv TURBo NONE

Key Entry **1/2 Conv** **1/3 Conv** **Turbo** **None**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:CRC

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
CRC <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
CRC?
```

This command sets the number of cyclic redundancy check (CRC) bits for the dedicated transport channel (DCH).

***RST** 8

Choices 0 8 12 16 24

Field Entry `CRC Size`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
DATA PN9|FIX4|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
DATA?
```

This command configures the data for the downlink dedicated transport channel (DCH) selected.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9

Choices PN9 FIX4 "<file name>"

Key Entry **PN9** **FIX4** **"<User File>"**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
DATA:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
DATA:FIX4?
```

This command sets a fixed data type to be transmitted on the selected downlink dedicated transport channel (DCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Key Entry **FIX4**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:NBLocks

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
NBLocks <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
NBLocks?
```

This command sets the number of blocks transmitted by the active downlink dedicated transport channel (DCH).

***RST** 1

Range 1–8

Field Entry # of Blocks

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:POSition

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
POSition FLEXible|FIXed
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
POSition?
```

This command selects the coupling mode.

FLEXible This choice makes the block set size (BBSize) not editable and the track's block size. Setting the BBSize while flexible will result in a error message.

FIXed This choice makes the BBSize editable. The block size is also editable, but limited to two values, either equal to BBSize or 0. If attempting to set the value outside the two values, it will result in an error message and the block size being set equal to the BBSize.

***RST** FLEX

Choices FLEXible FIXed

Key Entry **Transp Position Flexible Fixed**

Remarks N/A

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:PPERcentage

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
PPERcentage?
```

This query returns the percentage of the total bits removed from or added to the fully coded channel.

***RST** N/A

Range N/A

Key Entry N/A

Remarks N/A

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:RMATch

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
RMATch <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
RMATch?
```

This command sets the rate matching attribute.

***RST** 1

Range 1–256

Field Entry `Rate Match Attr`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:TTI

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
TTI 10000|20000|40000|80000
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|6:
TTI?
```

This command sets the transmission time interval (TTI) allowed for the dedicated channel (DCH) to transmit.

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

***RST** 10000

Choices 10000 20000 40000 80000

Field Entry `TTI`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":DLINk:APPLy" on page 780.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|
6[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]:DCH[1]|2|3|4|5|
6[:STATe]?
```

This command enables or disables the selected dedicated transport channel (DCH).

***RST** *DCH 1*:1 *DCH 2–6*:0

Choices ON OFF 1 0

Key Entry **TrCH State Off On**

Remarks DCH1 reset value cannot be turned off. The channels must be turned on sequentially. If one channel is turned off then all higher numbered channels will automatically be turned off.

If the parameter is changed, the apply command must be executed after the change. Refer to ":DLINk:APPLy" on page 780.

:LINK

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:LINK DOWN|UP
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:LINK?
```

This command sets the uplink or downlink mode.

***RST** DOWN

Choices DOWN UP

Key Entry **Link Down Up**

Remarks N/A

:POLarity[:ALL]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:POLarity[:ALL]?
```

This command selects the polarity for the Q channel.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Choices NORMal INVerted

Key Entry **Phase Polarity Normal Inverted**

Remarks N/A

:ULINk:APPLy

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:APPLy
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:APPLy?
```

This command immediately starts the channel coding generation process according to the channel setup and data for the uplink physical and transport channels.

The query returns a response that determines whether or not the execution of the command is necessary. The response from the query is as follows:

1 This response is returned if the execution of the command is required.

0 This response is returned if the execution of the command is not required.

***RST** +0

Range N/A

Key Entry **Apply Channel Setup**

Remarks N/A

:ULINk:AWGN:CN

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:CN <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:CN?
```

This command sets the in band carrier to noise ratio. The noise is the total noise level of the in-channel.

The variable <val> is expressed in units of decibels (dB).

***RST** –1.80000000E+001

Range –30 to 30

Field Entry C/N value

Remarks In compressed mode, carrier power means normal frame power. A change in the C/N value will change the Eb/No value and vice versa.

:ULINk:AWGN:CPOWer

Supported All with Option 400 and 403

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:CPOWer?

This query returns the carrier power level when the additive white gaussian noise (AWGN) is on.

The power value is expressed in units of decibels (dBm).

***RST** –1.56957537E+002

Range N/A

Field Entry C Power

Remarks In compressed mode, carrier power means normal frame power.

:ULINk:AWGN:DRATe

Supported All with Option 400 and 403

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:DRATe?

This query returns the data rate of the Eb reference channel.

***RST** +1.22000000E+004

Range N/A

Field Entry N/A

Remarks N/A

:ULINk:AWGN:EBNO

Supported All with Option 400 and 403

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:EBNO <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:EBNO?

This command sets the Eb/No ratio. The *Eb* is defined as the carrier power divided by

the bit rate. *No* is noise power divided by the bandwidth (3.84MHz).

The variable <val> setting is affected by the carrier to noise ratio (C/N) and the data rate. A change to either of these values will affect your Eb/No setting. Use the formula in the range field to determine a correct Eb/No value.

***RST** +6.97971394E+000

Range Eb/No = C/N x 3.84MHz/DataRate

Field Entry `Eb/No value (dB)`

Remarks N/A

:ULINk:AWGN:EBRef

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:EBRef DPCCh|DPDCh|DCH1|
DCH2|DCH3|DCH4|DCH5|DCH6
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:EBRef?
```

This command selects the Eb reference and it is used in the Eb/No value.

DPCCh This choice selects a dedicated physical control channel.

DPDCh This choice selects a dedicated physical data channel.

DCH1 This choice select dedicated transport channel 1.

DCH2 This choice select dedicated transport channel 2.

DCH3 This choice select dedicated transport channel 3.

DCH4 This choice select dedicated transport channel 4.

DCH5 This choice select dedicated transport channel 5.

DCH6 This choice select dedicated transport channel 6.

***RST** DCH1

Choices DPCCh DPDCh DCH1 DCH2
DCH3 DCH4 DCH5 DCH6

Key Entry **DPCCH DPDCH DCH1 DCH2**
DCH3 DCH4 DCH5 DCH6

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:AWGN:FNBW

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:FNBW?
```

This query returns the flat noise bandwidth (BW). Flat noise bandwidth is calculated by BW=(1.6) x (Chip rate) and the result is close to the 0 dB roll-off point.

***RST** +6.14400000E+006

Range N/A

Field Entry `Flat Noise BW`

Remarks N/A

:ULINk:AWGN:NPOWer

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:NPOWer?
```

This query returns the noise power portion of the total RF power.

The power value is expressed in units of decibels (dBm).

***RST** –1.38957537E+002

Range N/A

Field Entry `N Power`

Remarks N/A

:ULINk:AWGN[:STATe]

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:STATe ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:AWGN:STATe?
```

This command enables or disables the additive white gaussian noise (AWGN). AWGN can only be turned on when DPCCH is selected as the physical channel. Refer to ":ULINk:PHYSical[1]:TYPE" on page 845.

***RST** 1

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks If the parameter is changed, the apply command must be executed after the change. Refer to ":ULINk:APPLy" on page 820.

:ULINk:CRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:CRATe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:CRATe?
```

This command sets the chip rate for the uplink configuration.

The variable <val> is expressed in cycles per second (cps).

***RST** +3.84000000E+006

Range 1E3–4.25E6

Field Entry `Chip Rate`

Remarks The chip rate is equivalent to the spreading rate of the channel.

:ULINk:DPCCh:BETA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:BETA <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:BETA?
```

This command sets the beta value for the uplink dedicated physical control channel (DPCCH). The beta value and the power ratio are coupled. When the power ratio is updated, the beta value is converted to the beta ratio (amplitude ratio).

***RST** +11

Range –40 to 30

Field Entry `Beta`

Remarks After this command is sent, the channel power level for the DPCCH is re-calculated. If the channel power is set directly, the beta value of this command becomes invalid and is reset to –1.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:CCODe?
```

This command sets the channelization code for the uplink dedicated physical control channel (DPCCH).

***RST** 0

Range 0–255

Field Entry Channel Code

Remarks The maximum value is dependent on the symbol rate. Refer to ":DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SRATe" on page 802.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:DATA PN9|PN15|FIX4|
"<file name>"|STD
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:DATA?
```

This command configures the data pattern for the uplink dedicated physical control channel (DPCCH).

STD	This choice sets the DPCCH to use the bits field as defined by the slot format.
"<file name>"	This variable specifies a data pattern that has been stored in memory.

***RST** STD

Choices PN9 PN15 FIX4 "<file name>" STD

Key Entry **PN9** **PN15** **FIX4** **User File** **STD**

Remarks If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:DATA:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:DATA:FIX4?
```

This command sets the 4-bit data pattern of the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Field Entry `Data`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:FBI:PATTern

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:FBI:PATTern PN9|PN15|FIX|
"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:FBI:PATTern?
```

This command configures the pattern of the feedback information (FBI) for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX

Choices PN9 PN15 FIX "<file name>"

Key Entry **PN9** **PN15** **FIX** **User File**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:FBI:PATTern:FIX

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:FBI:PATTern:FIX <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:FBI:PATTern:FIX?
```

This command sets the 30-bit feedback information (FBI) pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

***RST** +0

Range 0–10737418235

Key Entry N/A

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:FBI[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:FBI[:STATe]?
```

This query returns whether or not the feedback information (FBI) bits are included in the uplink dedicated physical control channel (DPCCH). The FBI is included when a status of one is returned. A zero indicates no FBI.

***RST** 0

Range N/A

Field Entry FBI State

Remarks N/A

:ULINk:DPCCh:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:POWer?
```

This command sets the power level for the uplink dedicated physical control

channel (DPCCH).

The variable <val> is expressed in units of decibels (dB).

***RST** –2.69000000E+000

Range –40 to 0

Field Entry Power

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:RATE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:RATE?
```

This query returns the symbol rate for the uplink dedicated physical control channel (DPCCH).

***RST** +1.50000000E+004

Range N/A

Field Entry Symbol Rate

Remarks N/A

:ULINk:DPCCh:SLOTformat

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:SLOTformat <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:SLOTformat?
```

This command sets the slot format for the uplink dedicated physical control channel (DPCCH).

The variable <val> is expressed in unit of bits.

***RST** +0

Range 0–5

Field Entry Slot Format

Remarks If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TFCI:PATTern

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TFCI:PATTern PN9|PN15|FIX|
"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TFCI:PATTern?
```

This command configures the transport format combination indicator (TFCI) bit pattern for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9

Choices PN9 PN15 FIX "<file name>"

Key Entry **PN9** **PN15** **FIX** **User File**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TFCI:PATTern:FIX

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TFCI:PATTern:FIX <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TFCI:PATTern:FIX?
```

This command sets the transport format combination indicator (TFCI) 10-bit data pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

***RST** +0

Range 0–1023

Key Entry **FIX**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TFCI[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TFCI[:STATe]?
```

This query returns the status of the transport format combination indicator (TFCI) for the uplink dedicated physical control channel (DPCCH).

***RST** 1

Range N/A

Field Entry `TFCI State`

Remarks N/A

:ULINk:DPCCh:TPC:NSTeps

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:NSTeps <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:NSTeps?
```

This command sets the number of steps to increase or decrease the transmit power control (TPC) for the uplink dedicated physical control channel (DPCCH).

The variable <val> is expressed in units of decibels (dB).

***RST** +1

Range 1–80

Field Entry `TPC Pat Steps`

Remarks Refer to ":ULINk:DPCCh:TPC:PATTern" on page 830.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TPC:PATTern

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern PN9|PN15|FIX4|
"<file name>"|UDOW|DUP|UALL|DALL
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern?
```

This command configures the transmit power control (TPC) pattern for the uplink dedicated physical control channel (DPCCH).

"<file name>"	This variable specifies a data pattern that has been stored in memory.
UDOW	This choice repetitively steps up and down the TPC pattern.
DUP	This choice repetitively steps down and up the TPC pattern.
UALL	This choice consecutively steps up the TPC pattern.
DALL	This choice consecutively steps down the TPC pattern.

***RST** PN9

Choices PN9 PN15 FIX4 "<file name>" UDOW DUP UALL DALL

Key Entry **PN9 PN15 FIX4 "<file name>" Up/Down Down/Up All Up All Down**

Remarks Refer to ":ULINk:DPCCh:TPC:NSTeps" on page 830.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TPC:PATTern:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:FIX4?
```

This command sets the transmit power control (TPC) 4 bit data pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Key Entry **FIX4**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TPC:PATTern:TRIGger:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:TRIGger:
POLarity POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:TRIGger:
POLarity?
```

This command sets the transmit power control (TPC) pattern trigger polarity for the uplink dedicated physical control channel (DPCCH).

POSitive This choice sets the pattern signal to trigger when the signal is high.

NEGative This choice sets the pattern signal to trigger when the signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **TPC Pat Trig Polarity Neg Pos**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TPC:PATTern:TRIGger[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:
TRIGger[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:
TRIGger[:STATe]?
```

This command enables or disables the transmit power control (TPC) pattern trigger state for the uplink dedicated physical control channel (DPCCH).

***RST** 0

Choices ON OFF 1 0

Key Entry **TPC Pat Trig Off On**

Remarks The TPC pattern trigger input is located on the AUX I/O connector (ALT PWR IN, pin#16). For more information about the rear panel AUX I/O connector, refer to "Signal Generator Overview" in the

User's Guide.

If the parameter is changed, the apply command must be executed after the change. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh:TPOWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPOWer?
```

This query returns the "Total Power" value displayed on the user interface (UI). The power value is the relative power difference between the total in-channel signal power and the active channel reference power (0dB).

***RST** +0.00000000E+000

Range N/A

Key Entry N/A

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPCCh[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh[:STATe]?
```

This command enables or disables the operating state for the uplink dedicated physical control channel (DPCCH).

***RST** 1

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks DPCCH and PRACH cannot be active at the same time, only one of these channels can be turned on.

If the parameter is changed, the apply command must be executed after the change. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:BETA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:BETA <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:BETA?
```

This command sets the beta value for uplink dedicated physical data channel (DPDCH).

***RST** +15

Range 0–15

Field Entry `Beta`

Remarks The beta value and power ratio are coupled. After this command is sent, the value of the channel power level of the DPDCH is re-calculated.

If the channel power is set directly, the value of this command becomes invalid and is set to –1.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:CCODe?
```

This command sets the channelization code for the uplink dedicated physical data channel (DPDCH). There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to Table 2 on page 835.

Table 2 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

***RST** +16

Range 0–255

Field Entry `Channel Code`

Remarks Refer to ":ULINk:DPDCh:SLOTformat" on page 838 and ":ULINk:DPDCh:RATE" on page 837. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:DATA PN9|PN15|FIX4|
"<file name>"|TRANspch
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:DATA?
```

This command configures the data pattern of the uplink dedicated physical data channel (DPDCH).

TRANspch — This choice sets the data that is generated from the transport channel setup.

"<file name>" — This variable specifies a data pattern that has been stored in memory.

***RST** TRAN

Choices PN9 PN15 FIX4 "<file name>" TRANspch

Key Entry **PN9** **PN15** **FIX4** **User File** **Transport CH**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:DATA:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:DATA:FIX4?
```

This command sets the fixed 4-bit binary data for the uplink dedicated physical data channel (DPDCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Key Entry **FIX4**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:POWer?
```

This command sets the power level for the uplink dedicated physical data channel (DPDCH).

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry Power

Remarks The power ratio and the beta value are coupled. After the beta value is specified and sent, the value of the channel power level of the DPDCH is re-calculated.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:RATE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:RATE <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:RATE?
```

This command sets the symbol rate for the uplink dedicated physical data channel (DPDCH). There are commands that are associated with the symbol rate and they are the channelization code and the slot format.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to Table 3.

Table 3 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

The variable <val> is expressed in units of kilo symbols per second (ksps).

***RST** +6.00000000E+004

Range 15000–960000

Field Entry Symbol Rate

Remarks Refer to ":ULINk:DPDCh:CCODe" on page 834 and ":ULINk:DPDCh:RATE" on page 837. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:RBER

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:RBER?
```

This query returns inserted error bit rate which specified by the TBER command.

***RST** 0.0

Range N/A

Field Entry N/A

Remarks N/A

:ULINk:DPDCh:SLOTformat

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:SLOTformat <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:SLOTformat?
```

This command sets the slot format for the uplink dedicated physical data channel (DPDCH).

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to Table 4 on page 839.

Table 4 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

***RST** +2

Range 0–6

Field Entry Slot Format

Remarks Refer to ":ULINk:DPDCh:CCODe" on page 834 and ":ULINk:DPDCh:RATE" on page 837. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:DPDCh:TBER

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:TBER <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:TBER?
```

This command sets the total bit error rate for the uplink dedicated physical data channel (DPDCH).

This command is used to verify functionality of the transport channel bit error rate (TBER) measurement in BTS. The TBER is an estimation of the average BER of the DPDCH data of the radio link set in normal operation.

This command is able to add bit errors on the DPDCH symbol bit sequence that is generated from the transport channel coding process. One bit error is inserted in the

length of the bits specified by the parameter. For example: “100” means 1 bit error is inserted in 100 bits.

***RST** 0

Range 0–65535

Field Entry TrCH BER

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINk:APPLy” on page 820

:ULINk:DPDCh:TPOWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:TPOWer?
```

This query returns the “Total Power” value displayed on the user interface (UI). The power value is the relative power difference between the total in-channel signal power and the active channel reference power (0dB).

***RST** +0

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:DPDCh[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh[:STATe]?
```

This command enables or disables the operating state for the uplink dedicated physical data channel (DPDCH).

***RST** 1

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks When PRACH is selected, DPDCH cannot be turned on.

If the parameter is changed, the apply command must be executed

after the change. Refer to":ULINk:APPLy" on page 820.

:ULINk:FCLock:INTerval

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FCLock:INTerval FCL10|FCL20|
FCL40|FCL80|FCL2560
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FCLock:INTerval?
```

This command selects the frame clock interval supplied to the source.

The frame clock interval is set in units of milliseconds (msec).

***RST** FCL80

Choices FCL10 FCL20 FCL40 FCL80 FCL2560

Key Entry **10 msec** **20 msec** **40 msec** **80 msec** **2560 msec**

Remarks N/A

:ULINk:FCLock:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FCLock:POLarity POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FCLock:POLarity?
```

This command sets the polarity of the frame clock for the uplink synchronization source.

POSitive This choice sets the clock gate to trigger when the signal is high.

NEGative This choice sets the clock gate to trigger when the signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **Frame Clock Polarity Neg Pos**

Remarks N/A

:ULINk:FILTer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer RNYQuist|NUQuist|GAUSsian|
RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm| UGGaussian|
"<User FIR>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer?
```

This command selects the filter type for the uplink configuration.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<User FIR>"	This variable is any filter file that you have stored into memory.

***RST** RNYQ

Choices RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "<User FIR>"

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 14 for information on the file name syntax.

:ULINk:FILTer:ALPHa

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer:ALPHa <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer:ALPHa?
```

This command changes the alpha value for the Nyquist or root Nyquist filter.

***RST** +2.20000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks This command is effective only after a root Nyquist or Nyquist filter is selected; it does not affect other types of filters.

To change the current filter type, refer to ":ULINk:FILTer" on page 842.

:ULINk:FILTer:BBT

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer:BBT <value>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time filter parameter value for the Gaussian filter.

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after a Gaussian filter is selected; it does not affect other types of filters.

To change the current filter type, refer to ":ULINk:FILTer" on page 842.

:ULINk:FILTer:CHANnel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer:CHANnel EVM|ACP
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FILTer:CHANnel?
```

This command optimizes a filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection. This feature only applies to root Nyquist and Nyquist filters.

***RST** EVM

Choices EVM ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":ULINk:FILTer" on page 842.

:ULINk:FOFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FOFFset <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:FOFFset?
```

This command sets the SFN-CFN frame number offset. The command adds in delays of the internal frame counter by specifying the starting frame number count.

When the FOFFset is set to "0," the frame number starts at the system sync trigger.

An example of specifying a frame number count: Set the FOFFset to 2. This makes the signal generator to trigger 2 frames after the SFN RST.

***RST** 0

Range 0–255

Key Entry **SFN-CFN Frame Offset**

Remarks For additional information, refer to 3GPP TS25.402 for SFN and CFN relationship.

:ULINk:PADJust

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PADJust EQUal|SCALe
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PADJust?
```

This command adjusts the code domain power levels of all uplink channels.

EQUal This choice will adjust all channel powers to equal power settings.

SCALe This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

***RST** EQU

Choices EQUal SCALe

Key Entry **Equal Powers** **Scale To 0dB**

Remarks N/A

:ULINk:PHYSical[1]:TYPE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PHYSical[1]:TYPE DPCCh|PRACh
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PHYSical[1]:TYPE?
```

This command sets the physical channel type.

DPCCh This choice selects a dedicated physical channel type.

PRACh This choice selects a physical random access channel type.

***RST** DPCCh

Choices DPCCh PRACh

Key Entry **DPCCH** **PRACH**

Remarks N/A

:ULINk:PRACh:AICH:NUMBer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AICH:NUMBer?
```

This query returns the number of received acquisition indication channel (AICH) trigger during one configured physical random access channel (PRACH) signal generation.

The result value can be queried after the PRACH signal generation is completed and until the next PRACH generation trigger is received.

The signal begins when the PRACH start trigger and ends when the specified number of signals are generated.

To specify a number of PRACHs, refer to ":ULINk:PRACh:PREamble:NUMBer" on page 863.

***RST** –1

Range N/A

Field Entry N/A

Remarks A –1 status represents a PRACH generation is on going.

:ULINk:PRACh:AICH:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AICH:
POLarity POSition|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AICH:POLarity?
```

This command sets the trigger signal polarity for the acquisition indication channel (AICH).

POSitive This choice sets the signal polarity to trigger when the signal goes high.

NEGative This choice sets the signal polarity to trigger when the signal goes low.

***RST** POS

Choices POSitive NEGative

Key Entry `AICH Trigger Polarity Pos Neg`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820

:ULINk:PRACh:AWGN:CN

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:CN <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:CN?
```

This command sets the in band carrier to noise ratio.

The variable <val> is expressed in units of decibels (dB).

***RST** –2.25005194E+001

Range –30 to 30

Field Entry `C/N value`

Remarks A change in the C/N value will change the Eb/No value and vice versa.

:ULINk:PRACh:AWGN:CPOWer

Supported All with Option 400 and 403

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:CPOWer?`

This query returns the carrier power level when the physical random access channel's (PRACH) additive white gaussian noise (AWGN) is on.

***RST** –1.61435521E+002

Range N/A

Field Entry `C Power`

Remarks N/A

:ULINk:PRACh:AWGN:DRATe

Supported All with Option 400 and 403

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:DRATe?`

This query returns the data rate of the Eb (Ec) reference channel.

***RST** +8.40000000E+003

Range N/A

Field Entry `Ref Data Rate`

Remarks N/A

:ULINk:PRACh:AWGN:EBNO

Supported All with Option 400 and 403

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:EBNO <val>`
`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:EBNO?`

This command sets the Eb/No value. The *Eb* is defined as carrier divided by the bit rate. *No* is noise power divided by the bandwidth (3.84 MHz). This ratio is only referred when EREF is CONTrol or DATA.

The variable <val> setting is affected by the carrier to noise ratio (C/N) and the data rate. A change to either of these values will affect your Eb/No setting. Use the formula in the range field to determine a correct Eb/No value.

***RST** +4.10000000E+000

Range *Eb/No = C/N* x *3.84MHz/DataRate*

Field Entry Eb/No

Remarks N/A

:ULINk:PRACh:AWGN:ECNO

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:ECNO <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:ECNO?
```

This command sets the Ec/No value. The *Ec* is defined as carrier divided by the chip rate. *No* is the noise power divided by the bandwidth (3.84 MHz). This ratio is only referred when EREF is PREamble.

***RST** –2.05000000E+001

Range –30 to 30

Field Entry Ec/No value

Remarks N/A

:ULINk:PRACh:AWGN:ERef

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:
ERef PREamble|CONTrol|DATA|RACH
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:ERef?
```

This command selects the Eb (Ec) reference. It is used for specifying the bit (chip) rate of physical/transport channel.

PREamble	This choice selects a preamble part as the Eb/No reference.
CONTrol	This choice selects a message control part as the Eb/No reference.
DATA	This choice selects a message data part as the Eb/No reference.
RACH	This choice selects a random access channel as the Eb/No reference.

***RST** RACH

Choices PREamble CONTrol DATA RACH

Key Entry **Preamble** **Msg Ctrl** **Msg Data** **RACH TrCH**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:AWGN:NPOWer

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN:NPOWer?
```

This query returns the in-channel noise level when the additive white gaussian noise (AWGN) is on.

***RST** –1.38935002E+002

Range N/A

Field Entry `N Power`

Remarks N/A

:ULINk:PRACh:AWGN[:STATe]

Supported All with Option 400 and 403

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:AWGN[:STATe]?
```

This command enables or disables the additive white gaussian noise (AWGN) for the physical random access channel (PRACH). The AWGN can only be turned on when PRACH is selected as the physical channel.

***RST** 1

Choices ON OFF 1 0

Key Entry **Channel State Off On**

Remarks Refer to ":ULINk:PHYSical[1]:TYPE" on page 845.

If the parameter is changed, the apply command must be executed after the change. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:BETA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:BETA <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:BETA?
```

This command sets the beta ratio (amplitude ratio) for the physical random access channel (PRACH) message control part.

The variable <val> is an integer value. Changing the control power value (refer to, ":ULINk:PRACh:MESSage:CPARt:POWer" on page 852 for more information on setting PRACH control power) changes the beta to power ratio, and the signal generator may not be able to compute a proper control beta value. If this occurs, the query will return a minus one (–1).

***RST** +11

Range 0–15

Field Entry `Ctrl Beta`

Remarks A change to the beta value will also cause a change to the control power setting.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:CCODe?
```

This command sets the channelization code for the physical random access channel (PRACH) message control part.

There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the

maximum value. Refer to Table 5.

Table 5 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

***RST** +15

Range 0–255

Field Entry Channel Code

Remarks Refer to ":ULINk:PRACh:MESSage:CPARt:SLOTformat" on page 853 and ":ULINk:PRACh:MESSage:CPARt:RATE" on page 853.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:
DATA PN9|PN15|FIX4|"<file name>"|STD
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:DATA?
```

This command selects the data type to be inserted into the physical random access channel (PRACH) message control part.

STD This choice selects a slot format defined in the 3GPP standard.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** STD

Choices PN9 PN15 FIX4 "<file name>" STD

Key Entry **PN9** **PN15** **FIX4** **User File** **STD**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:DATA:
FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:DATA:FIX4?
```

This command sets a fixed 4 bit pattern for use as physical random access channel (PRACH) message part data.

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Field Entry Data

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:POWer?
```

This command sets the power level for the physical random access channel (PRACH) message control part.

The variable <val> is expressed in units of decibels (dB).

***RST** –2.69000000E+000

Range –40 to 0

Field Entry Ctrl Pwr

Remarks Changing the control power changes the beta to power ratio. Refer to ":ULINk:PRACh:MESSage:CPARt:BETA" on page 850 for more

information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820

:ULINk:PRACh:MESSage:CPARt:RATE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:RATE?
```

This query returns the message control part symbol rate of the physical random access channel (PRACH).

***RST** +1.50000000E+004

Range N/A

Key Entry N/A

Remarks The symbol rate of 15 kbps is the only supported rate.

:ULINk:PRACh:MESSage:CPARt:SLOTformat

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:
SLOTformat <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:SLOTformat?
```

This command sets the slot format for the physical random access channel's (PRACH) message control part.

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the

maximum value. Refer to Table 7.

Table 6 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

***RST** 0

Range 0–3

Field Entry Slot Format

Remarks Refer to ":ULINk:PRACh:MESSage:CPARt:CCODe" on page 850 and ":ULINk:PRACh:MESSage:CPARt:RATE" on page 853.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI:
PATTern PN9|PN15|FIX|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern?
```

This command selects data type to be inserted into the transport format combination indicator (TFCI) of the message control part located in the physical random access channel (PRACH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** FIX

Choices PN9 PN15 FIX "<file name>"

Key Entry **PN9** **PN15** **FIX** **User File**

Remarks If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern:FIX

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern:
FIX <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern:
FIX?
```

This command sets a fixed bit pattern to be inserted into the transport format combination indicator (TFCI).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

***RST** +0

Range 0–1023

Field Entry `TFCI Pattern`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:CPARt:TFCI[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI[:STATe]?
```

This query returns the transport format combination indicator (TFCI) bits to determine if they exist or not in the currently specified slot format. A query returned with a "1" determines a TFCI exists and a "0," no bits exist.

***RST** 1

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:PRACh:MESSage:DPARt:BETA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:BETA <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:BETA?
```

This command sets the beta ratio (amplitude ratio) for the message data part of the physical random access channel (PRACH).

The variable <val> is an integer value. Changing the data power value (refer to, ":ULINk:PRACh:MESSage:DPARt:POWer" on page 858 for more information on setting PRACH data power) changes the beta to power ratio, and the signal generator may not be able to compute a proper data beta value. If this occurs, the query will return a minus one (–1).

***RST** +11

Range 0–15

Field Entry Data Beta

Remarks A change to the beta value will also cause a change to the data power setting.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:DPARt:CCODe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:CCODe <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:CCODe?
```

This command sets the channelization code for the physical random access channel (PRACH) message data part.

There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the

maximum value. Refer to Table 7.

Table 7 Channelization Code Maximum value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

***RST** +0

Range 0–255

Field Entry `Channel Code`

Remarks Channel code value is determined by slot format choice. Refer to ":ULINk:PRACh:MESSage:DPARt:SLOTformat" on page 860 and ":ULINk:PRACh:MESSage:DPARt:RATE" on page 859.

If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:DPARt:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:
DATA PN9|PN15|FIX4|"<file name>"|TRANspch
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:DATA?
```

This command sets the data type to be inserted into physical random access channel (PRACH) message data part.

TRANspch This choice sets the data that is generated from the transport channel setup.

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** TRAN

Choices PN9 PN15 FIX4 "<file name>" TRANspch

Key Entry **PN9** **PN15** **FIX4** **User File** **Transport CH**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:DPARt:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:DATA:
FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:DATA:FIX4?
```

This command sets a pseudo-random pattern as output data type in the message data part of the physical random access channel (PRACH).

While the variable <val> is expressed in binary or decimal formats, the query returns only binary units

***RST** #B0000

Range 0–15

Field Entry Data

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:DPARt:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:POWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:POWer?
```

This command sets the power level for the physical random access channel (PRACH) message data part.

The variable <val> is expressed in units of decibels (dB).

***RST** –2.69000000E+000

Range –40 to 0

Field Entry `Data Pwr`

Remarks Changing the data power changes the beta to power ratio. Refer to ":ULINk:PRACh:MESSage:DPARt:BETA" on page 856 for more information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820

:ULINk:PRACh:MESSage:DPARt:RATE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:RATE 15KBPS
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:RATE?
```

This command sets the symbol rate for the message data part of the physical random access channel (PRACH).

There are commands that are associated with the symbol rate and they are the channelization code and the slot format.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to Table 8.

Table 8 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

The variable <val> is expressed in units of kilo symbols per second (ksps).

***RST** 60

Range 15-120

Field Entry `Symbol Rate`

Remarks Channel code value is determined by slot format choice. Refer to ":ULINk:PRACh:MESSage:DPARt:SLOTformat" on page 860 and ":ULINk:PRACh:MESSage:DPARt:CCODe" on page 856.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:DPARt:SLOTformat

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:
SLOTformat <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:SLOTformat?
```

This command sets the slot format value for the message data part of the physical random access channel (PRACH).

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to Table 9.

Table 9 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

The variable <val> is expressed in units of kilo symbols per second (ksps).

***RST** 0

Range 0–3

Field Entry Slot Format

Remarks Refer to ":ULINk:PRACh:MESSage:DPARt:RATE" on page 859 and ":ULINk:PRACh:MESSage:DPARt:CCODe" on page 856.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage:TPOWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:TPOWer <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:TPOWer?
```

This command sets the message total power value in the physical random access channel (PRACH).

The variable <val> is expressed in units of decibels (dB). The RF output power is limited to the signal generator's specifications.

***RST** –1.36000000E+002

Range –136 to 20

Field Entry `Max Pwr`

Remarks This value is used only when POWer:MODE is set to TOTal. Refer to ":ULINk:PRACh:PREamble:POWer:MODE" on page 864.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:MESSage[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:
MESSage[:STATe] ON|OFF|1|0|AICH
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage[:STATe]?
```

This command enables or disables the message part of the physical random access channel (PRACH).

ON(1) This choice enables the message part to be generated after the number

of preambles are generated. The “Number of Preamble” must be specified.

OFF(0) This choice does not allow the message part to be generated. Only the preambles are transmitted.

AICH This choice enables the message part to be generated instead of the preamble when the acquisition indication channel’s (AICH) trigger is received from the AUX I/O pin#17. After generating the number of preambles that were specified in “Number of Preamble” without the AICH trigger reception, No Message part is generated until the next PRACH pattern starts.

***RST** 1

Choices ON OFF 1 0 AICH

Key Entry **On Off AICH**

Remarks For more information about the rear panel AUX I/O connector, refer to "Signal Generator Overview" in the *User’s Guide*.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINk:APPLy” on page 820.

:ULINk:PRACh:NUMBer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:NUMBer <val>|INFinity
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:NUMBer?
```

This command specifies the number of the physical random access channel (PRACH) patterns to repeat after the PRACH start trigger has been received.

INFinity This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.

***RST** 1

Range 1–2147447836

Field Entry `Number of PRACH`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINk:APPLy” on page 820.

:ULINk:PRACh:PREamble:NUMBer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:NUMBer <val>|
INFinity
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:NUMBer?
```

This command specifies the number of preambles to repeat in one physical random access channel (PRACH) pattern.

INFinity — This choice means the repeating preamble will play continuously while the PRACH mode is selected.

***RST** 1

Range 1–8388607

Field Entry `Number of Preamble`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:PREamble:POWer:AVERage

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:AVERage?
```

This query returns the average power of preambles that were sent before the acquisition indication channel (AICH) trigger was received.

***RST** –999

Range N/A

Key Entry N/A

Remarks The average power value can be queried after the physical random access channel's (PRACH) signal generation is completed. Refer to ":ULINk:PRACh:PREamble:NUMBer" on page 863.

:ULINk:PRACh:PREamble:POWer:INITial

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:INITial?
```

This query returns the initial preamble power from POWer:Max value, RSTEp (ramp step) and PREamble:NUMBer commands.

***RST** –1.36000000E+002

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:PRACh:PREamble:POWer:MAX

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:MAX <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:MAX?
```

This command sets the maximum preamble power for the physical random access channel (PRACH).

In power ramping mode (RSTep is a non-zero value), the preamble power can go up until the acquisition indication channel's (AICH) signal is not received (maximum power).

The variable <val> is expressed in units of decibels (dB).

***RST** –1.36000000E+002

Range –136 to 20

Field Entry `Max Pwr`

Remarks The actual RF output is limited to the signal generator's specifications although the value can be entered up to 20 dBm.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:PREamble:POWer:MODE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:
MODE PPM|TOTal
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:MODE?
```

This command sets the message power calculation mode for the physical random access

channel (PRACH).

PPM — This choice calculates the message power based on the power differences between the preamble and the message control part. The difference is specified by the PPM command. This is based on 3GPP standards.

TOTal — This choice calculates message power based on power differences between preamble and message total part. The message total power is specified by the MESSage:TPOWer command. Refer to ":ULINk:PRACh:MESSage:TPOWer" on page 861.

***RST** PPM

Choices PPM TOTal

Key Entry **PRACH Power Setup Mode Pp-m Total**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:PREamble:POWer:RSTep

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:RSTep <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:POWer:RSTep?
```

This command sets the power ramping steps for the physical random access channel (PRACH) preamble.

The variable <val> is expressed in units of decibels (dB).

***RST** 0

Range 0–10

Field Entry `Ramp Step`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:PREamble:PPM

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:PPM <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:PPM?
```

This command sets the power difference between the preamble and the message control part in the physical random access channel (PRACH).

The variable <val> is expressed in units of decibels (dB).

***RST** –4.56032509E+000

Range –20 to 10

Field Entry `Pp-m`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:PREamble:SIGNature

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:SIGNature <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:SIGNature?
```

This command sets the signature encoded in the physical random access channel's (PRACH) preamble.

***RST** +0

Range 0–15

Field Entry `Signature`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:PREamble:RPARameter

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:
RPARameter TB168|TB360
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:PREamble:RPARameter?
```

This command sets a set of parameters as defined in 3GPP Standard (TS25.104) Reference Measurement Channel for the uplink (UL) physical random access channel (PRACH).

TB168 This choice sets the parameters for the transport block size = 168.

TB360 This choice sets the parameters for the transport block size = 360.

***RST** TB168

Choices TB168 TB360

Key Entry **TrCh BlkSize 168** **TrCh BlkSize 360**

Remarks When parameters are sets individually, CUSTom is returned for the query.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:SCRamblecode

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:SCRamblecode <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:SCRamblecode?
```

This command sets the physical random access channel's (PRACH) scrambling code.

***RST** +0

Range 0–8191

Field Entry PRACH Scrambling Code

Remarks The signature data is scrambled against a 4096 chip segment of the 2^{25} complex gold code generator.

If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:SDELay

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:SDELay <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:SDELay?
```

This command sets the number of timeslots to be delayed from the uplink synchronization source. One timeslot is equivalent to 2560 chips

***RST** +0

Range 0–119

Key Entry **Timeslot Offset**

Remarks The actual amount of timing difference is (TOFFset + SDELay * 2560) – (Tp–a).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:SUBChannel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:SUBChannel <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:SUBChannel?
```

This command sets the sub-channel number to send the first preamble of the physical random access channel's (PRACH).

***RST** +0

Range 0–11

Field Entry `Start Sub-Channel#`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:TOFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TOFFset <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TOFFset?
```

This command sets additional timing offset for the physical random access channel (PRACH).

The timing offset is to adjust the time distance from the uplink PRACH's frame timing which is the downlink's AICH framing timing minus the Tp–a to the actual uplink PRACH signal frame timing from the signal generator.

The downlink's AICH frame timing is provided by the synchronization signal. The

The variable <val> is expressed in chips.

***RST** +0

Range –512 to 2560

Key Entry **Timing Offset**

Remarks The actual timing offset is the timing difference from the synchronization signal from the signal generator's RF signal (TOFFset + SDELay * 2560) – (Tp–a).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:TPA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPA <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPA?
```

This command sets the time period (distance) between the physical random access channel's (PRACH) preamble to the acquisition indication channel's (AICH) frame.

The variable <val> is expressed in units of "chip".

***RST** 7680

Choices 0 7680 12800

Key Entry **Tp–a**

Remarks The actual timing offset is (TOFFset + SDELay * 2560) – (Tp–a).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820,

:ULINk:PRACh:TPM

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPM <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPM?
```

This command sets the time period between the preamble and the message part.

The variable <val> is expressed in access slot units.

***RST** +3

Range 1–15

Field Entry Tp-m

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:TPOWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPOWer?
```

This query returns the total power value of the physical random access channels (PRACH).

The value is the relative power difference between the total in-channel signal power of the PRACH message part and the active channel reference power (0dB) in the message part.

***RST** +0

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:PRACh:TPP

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPP <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TPP?
```

This command sets the time period between the preamble and another preamble before the message part.

The variable <val> is expressed in access slot units.

***RST** +3

Range 1–60

Field Entry Tp-p

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:TRIGger

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TRIGger
```

This command specifies the start of the physical random access channel's (PRACH) pattern.

***RST** N/A

Range N/A

Key Entry **PRACH Trigger**

Remarks The PRACH trigger source must be set to "Trigger" before executing this command. Refer to ":ULINk:PRACh:TRIGger:SOURce" on page 872.

:ULINk:PRACh:TRIGger:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TRIGger:
POLarity POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TRIGger:POLarity?
```

This command sets the trigger polarity of the physical random access channel type (PRACH).

POSitive	This choice sets the signal to trigger when the trigger signal is high.
NEGative	This choice sets the signal to trigger when the trigger signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **PRACH Trigger Polarity Neg Pos**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:TRIGger:SOURce

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TRIGger:
SOURce IMMediate|TRIGger
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TRIGger:SOURce?
```

This command sets the trigger source of the physical random access channel (PRACH).

IMMediate	This choice resets the waveform and immediately replays it from the start.
TRIGger	This choice plays the waveform after receiving the trigger command.

***RST** IMMediate

Choices IMMediate TRIGger

Key Entry **PRACH Trigger Source Immedi Trigger**

Remarks Refer to ":ULINk:PRACh:TRIGger:POLarity" on page 871 and ":ULINk:PRACh:TRIGger" on page 871 for additional information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:PRACh:TTI

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TTI 10000|20000
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:TTI?
```

This command sets the transmission time interval (TTI) period of the message part.

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

***RST** +20000

Choices 10000 20000

Field Entry TTI

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk:RMCHannel

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RMCHannel RMC122|RMC64|RMC144|
RMC384|UDI64|AMR122
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RMCHannel?
```

This command configures the uplink reference measurement channel by providing a one command access to a typical service channel configuration.

RMC122	This choice selects a reference measurement channel with a 12.2 kbps rate (25.141 V3.4).
RMC64	This choice selects a reference measurement channel with a 64.0 kbps rate (25.141 V3.4).
RMC144	This choice selects a reference measurement channel with a 144.0 kbps rate (25.141 V3.4).
RMC384	This choice selects a reference measurement channel with a 384.0 kbps rate (25.141 V3.4).
ARM122	This choice selects an adaptive multiple rate of 12.2 kbps (25.141 V3.4).
UDI64	This choice selects an ISDN unrestricted digital information 1B with a 64.0 kbps rate (25.141 V3.4).

***RST** RMC122

Choices RMC122 RMC64 RMC144 RMC384 UCI64 AMR122

Key Entry **RMC122 kbps (25.141 v3.4)** **RMC64 kbps (25.141 v3.4)** **RMC144 kbps (25.141 v3.4)** **RMC384 kbps (25.141 v3.4)** **ARM122 kbps (25.141v3.4)** **UDI64 kbps(25.141v3.4)**

Remarks N/A

:ULINk:RPANel:DPCH:INPut:ALTPower

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:INPut:ALTPower?`

This query returns the type of signal at the alternate power input (ALT PWR IN, AUX I/O connector pin#16) for the dedicated physical channel (DPCH) mode.

***RST** USER

Range N/A

Key Entry N/A

Remarks The signal name is TPC user file trigger (USER). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:INPut:BGATe

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:INPut:BGATe?`

This query returns the type of signal at the gate burst (BURST GATE IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** CSTT

Range N/A

Key Entry N/A

Remarks The signal name is compressed mode start trigger (CSST). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:INPut:BBGRef

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:INPut:BBGRef?`

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

***RST** CCL

Range N/A

Key Entry N/A

Remarks The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:INPut:PTRigger1

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:INPut:PTRigger1?`

This query returns the type of signal at the pattern trigger input 1 (PATT TRIG IN 1, rear panel) for the dedicated physical channel (DPCH) mode.

***RST** FSYN

Range N/A

Key Entry N/A

Remarks The signal name is frame synchronization (FSYN). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:INPut:PTRigger2

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:INPut:PTRigger2?`

This query returns the type of signal at the pattern trigger input 2 (PATT TRIG IN 2, AUX I/O connector pin#17) for the dedicated physical channel (DPCH) mode.

***RST** CSPT

Range N/A

Key Entry N/A

Remarks The signal name is compress mode stop trigger (CSPT). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:DCLock

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
DCLock RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:DCLock?
```

This command assigns a signal to the data clock output at the selected rear panel AUX I/O connector pin#6.

Table 10 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3

EVENt3: RPS0
EVENt4: RPS0
DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5 RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **DPDCH Raw Data (RPS2)** **DPDCH Data Raw Clock (RPS3)** **DPCCH Raw Data (RPS4)** **DPCCH Raw Data Clock (RPS5)** **10 ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)** **Compressed Frame (RPS8)** **TTI Frame Clock (RPS9)** **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:DOUT

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
DOUT RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7.

Table 11 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data

Table 11 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3
EVENt3: RPS0
EVENt4: RPS0
DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5
RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **DPDCH Raw Data (RPS2)**
DPDCH Data Raw Clock (RPS3) **DPCCH Raw Data (RPS4)**
DPCCH Raw Data Clock (RPS5) **10 ms Frame Pulse (RPS6)**
Trigger Sync Reply (RPS7) **Compressed Frame (RPS8)**
TTI Frame Clock (RPS9) **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:EVENt1

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
EVENt1 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:EVENt1?
```

This command assigns a signal to the EVENT 1 at the rear panel output connector.

Table 12 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3
EVENt3: RPS0
EVENt4: RPS0
DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5
RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **DPDCH Raw Data (RPS2)**
DPDCH Data Raw Clock (RPS3) **DPCCH Raw Data (RPS4)**
DPCCH Raw Data Clock (RPS5) **10 ms Frame Pulse (RPS6)**
Trigger Sync Reply (RPS7) **Compressed Frame (RPS8)**
Frame Clock (RPS9) **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:EVENt2

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
EVENt2 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:EVENt2?
```

This command assigns a signal to the EVENT 2 at the rear panel output connector.

Table 13 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse

Table 13 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3
EVENt3: RPS0
EVENt4: RPS0
DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5
RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **DPDCH Raw Data (RPS2)**
DPDCH Data Raw Clock (RPS3) **DPCCH Raw Data (RPS4)**
DPCCH Raw Data Clock (RPS5) **10 ms Frame Pulse (RPS6)**
Trigger Sync Reply (RPS7) **Compressed Frame (RPS8)**
TTI Frame Clock (RPS9) **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:EVENt3

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
EVENt3 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:EVENt3?
```

This command assigns a signal to the EVENT 3 output at the selected rear panel AUX

I/O connector pin#19.

Table 14 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3
EVENt3: RPS0
EVENt4: RPS0
DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5
RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0) Chip Clock (RPS1) DPDCH Raw Data (RPS2)**
DPDCH Data Raw Clock (RPS3) DPCCH Raw Data (RPS4)
DPCCH Raw Data Clock (RPS5) 10 ms Frame Pulse (RPS6)
Trigger Sync Reply (RPS7) Compressed Frame (RPS8)

TTI Frame Clock (RPS9) **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:EVENt4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
EVENt4 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:EVENt4?
```

This command assigns a signal to the EVENT 4 output at the selected rear panel AUX I/O connector pin#18.

Table 15 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3
EVENt3: RPS0
EVENt4: RPS0

DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5
RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **DPDCH Raw Data (RPS2)** **DPDCH Data Raw Clock (RPS3)** **DPCCH Raw Data (RPS4)** **DPCCH Raw Data Clock (RPS5)** **10 ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)** **Compressed Frame (RPS8)** **TTI Frame Clock (RPS9)** **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:DPCH:OUTPut:SSYNc

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:
SSYNc RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:DPCH:OUTPut:SSYNc?
```

This command assigns a signal to SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5.

Table 16 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
RPS6	10ms frame pulse

Table 16 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

***RST** *EVENt1*: RPS2
EVENt2: RPS3
EVENt3: RPS0
EVENt4: RPS0
DOUT: RPS4
DCLock: RPS1
SSYNc: RPS7

Choices RPS0 RPS1 RPS2 RPS3 RPS4 RPS5
RPS6 RPS7 RPS8 RPS9 RPS10

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **DPDCH Raw Data (RPS2)**
DPDCH Data Raw Clock (RPS3) **DPCCH Raw Data (RPS4)**
DPCCH Raw Data Clock (RPS5) **10 ms Frame Pulse (RPS6)**
Trigger Sync Reply (RPS7) **Compressed Frame (RPS8)**
TTI Frame Clock (RPS9) **CFN #0 Frame Pulse (RPS10)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:INPut:ALTPower

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:INPut:ALTPower?`

This query returns the signal type at the ALT PWR IN (alternate power in) connector pin for the physical random access channel (PRACH) mode.

***RST** NONE

Range N/A

Field Entry `Alt power in`

Remarks For more information about the rear panel AUX I/O connector pin configuration, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:INPut:BGATe

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:INPut:BGATe?`

This query returns the signal type at the BURST GATE IN connector for the physical random access channel (PRACH) mode.

***RST** PSTR

Range N/A

Field Entry `Burst gate in`

Remarks The signal name is PRACH start trigger (PSTR). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:INPut:BBGRef

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:INPut:BBGRef?`

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the physical random access channel (PRACH) mode.

***RST** CCL

Range N/A

Key Entry N/A

Remarks The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:INPut:PTRigger1

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:INPut:PTRigger1?
```

This query returns the signal type at the pattern trigger in 1 (PATT TRIG IN) connector for the physical random access channel (PRACH) mode.

***RST** FSYN

Range N/A

Field Entry `Pattern trigger in 1`

Remarks The signal name is frame synchronization (FSYN). For more information about the rear panel I/O connectors' configuration, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:INPut:PTRigger2

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:INPut:PTRigger2?
```

This query returns the signal type at the pattern trigger input 2 (PATT TRIG IN 2 AUX I/O connector pin#17) for the physical random access channel (PRACH) mode.

***RST** AITR

Range N/A

Field Entry `Pattern trigger in 2`

Remarks The signal name is AICH trigger (AITR). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:DCLock

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:
DCLock RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|
RPS17|RPS19|RPS20|RPS21|RPS22|RPS23|
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:DCLock?
```

This command assigns a signal at the data clock output for the selected rear panel AUX

I/O connector pin#6.

Table 17 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0) Chip Clock (RPS1) Message-Data Raw Data (RPS11) 10ms Frame Pulse (RPS6) Trigger Sync Reply (RPS7) Message-Data Raw Clock (RPS12) Message-Control Raw Data (RPS13) Preamble Raw Data (RPS15) Preamble Raw Data Clock (RPS16)**

Sub Channel Timing (RPS17) **PRACH Processing (RPS19)**

80ms Frame Pulse(RPS20) **Preamble Pulse (RPS21)**

Message Pulse (RPS22) **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:DOUT

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:DOUT RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|RPS17|RPS19|RPS20|RPS21|RPS22|RPS23`
`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:DOUT?`

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7.

Table 18 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing

Table 18 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)** **Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)** **10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)** **Preamble Raw Data (RPS15)** **Preamble Raw Data Clock (RPS16)** **Sub Channel Timing (RPS17)** **PRACH Processing (RPS19)** **80ms Frame Pulse(RPS20)** **Preamble Pulse (RPS21)** **Message Pulse (RPS22)** **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:EVENt1

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:
EVENt1 RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|
RPS17|RPS19|RPS20|RPS21|RPS22|RPS23
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:EVENt1?
```

This command assigns a signal to the EVENT 1 at the selected rear panel connector.

Table 19 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)** **Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)** **10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)**

Preamble Raw Data (RPS15) **Preamble Raw Data Clock (RPS16)**
Sub Channel Timing (RPS17) **PRACH Processing (RPS19)**
80ms Frame Pulse(RPS20) **Preamble Pulse (RPS21)**
Message Pulse (RPS22) **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:EVENt2

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:
EVENt2 RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|
RPS17|RPS19|RPS20|RPS21|RPS22|RPS23
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:EVENt2?
```

This command assigns a signal to the EVENT 2 at the rear panel connector.

Table 20 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing

Table 20 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)** **Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)** **10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)** **Preamble Raw Data (RPS15)** **Preamble Raw Data Clock (RPS16)** **Sub Channel Timing (RPS17)** **PRACH Processing (RPS19)** **80ms Frame Pulse(RPS20)** **Preamble Pulse (RPS21)** **Message Pulse (RPS22)** **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:EVENt3

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:
EVENt3 RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|
RPS17|RPS19|RPS20|RPS21|RPS22|RPS23
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:EVENt3?
```

This command assigns a signal to the EVENT 3 output at the selected rear panel

AUX I/O connector pin#19.

Table 21 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)** **Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)** **10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)**

Preamble Raw Data (RPS15) **Preamble Raw Data Clock (RPS16)**
Sub Channel Timing (RPS17) **PRACH Processing (RPS19)**
80ms Frame Pulse(RPS20) **Preamble Pulse (RPS21)**
Message Pulse (RPS22) **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:EVENt4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:
EVENt4 4RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|
RPS17|RPS19|RPS20|RPS21|RPS22|RPS23
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:EVENt4?
```

This command assigns a signal to the EVENT 4 output at the selected rear panel AUX I/O connector pin#18.

Table 22 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing

Table 22 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)** **Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)** **10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)** **Preamble Raw Data (RPS15)** **Preamble Raw Data Clock (RPS16)** **Sub Channel Timing (RPS17)** **PRACH Processing (RPS19)** **80ms Frame Pulse(RPS20)** **Preamble Pulse (RPS21)** **Message Pulse (RPS22)** **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:RPANel:PRACh:OUTPut:SSYNc

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:
SSYNc RPS0|RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|
RPS17|RPS19|RPS20|RPS21|RPS22|RPS23
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RPANel:PRACh:OUTPut:SSYNc?
```

This command assigns a signal to SYM SYNC OUT at the selected rear panel AUX I/O

connector pin#5.

Table 23 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS11	Message-data raw data
RPS12	Message-data raw data clock
RPS13	Message-ctrl raw data
RPS14	Message-ctrl raw data clock
RPS15	Preamble raw data
RPS16	Preamble raw data clock
RPS17	Sub channel timing
RPS19	PRACH processing
RPS20	80ms frame pulse
RPS21	Preamble pulse
RPS22	Message pulse
RPS23	PRACH pulse
RPS15	Preamble raw data

***RST** RPS0

Choices RPS0 RPS1 RPS11 RPS12 RPS13 RPS14
RPS6 RPS7 RPS15 RPS16 RPS17
RPS19 RPS20 RPS21 RPS22 RPS23

Key Entry **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)**
Message-Data Raw Clock (RPS12) **Message-Control Raw Data (RPS13)**

10ms Frame Pulse (RPS6) **Trigger Sync Reply (RPS7)**
Preamble Raw Data (RPS15) **Preamble Raw Data Clock (RPS16)**
Sub Channel Timing (RPS17) **PRACH Processing (RPS19)**
80ms Frame Pulse(RPS20) **Preamble Pulse (RPS21)**
Message Pulse (RPS22) **PRACH Pulse (RPS23)**

Remarks For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *User's Guide*.

:ULINk:SCRamblecode

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SCRamblecode <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SCRamblecode?
```

This command sets the uplink scramble code.

***RST** +0

Range 0–16777215

Field Entry `Scrambling Code`

Remarks N/A

:ULINk:SDELay

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SDELay <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SDELay?
```

This command sets the number of timeslots to be delayed for the dedicated physical channel (DPCH).

***RST** +0

Range 0–119

Key Entry **Timing Offset**

Remarks The actual amount of timing offset is
(T0) + (TOFFset) + (SDELay) * 2560 chips, where T0 = 1024 chips.

:ULINk:SFNRst:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SFNRst:POLarity POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SFNRst:POLarity?
```

This command sets the polarity of the system frame number reset signal for the uplink synchronization source.

POSitive	This choice sets the signal to trigger when the trigger signal is high.
NEGative	This choice sets the signal to trigger when the trigger signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **SFN RST Polarity Neg Pos**

Remarks N/A

:ULINk:SYNC:MODE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SYNC:MODE SINGle|CONTinuous
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SYNC:MODE?
```

This command selects the uplink frame synchronization triggering mode.

SINGle	This choice sets the signal generator, once triggered, to generate frames based on the reference clock.
CONTinuous	This choice sets the signal generator to continuously align the frame sync trigger signal and the frame timing.

***RST** SING

Choices SINGle CONTinuous

Key Entry **Sync Trigger Mode Single Cont**

Remarks N/A

:ULINk:SYNC[:SOURce]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SYNC[:SOURce] SFN_RST|FCLock
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SYNC[:SOURce]?
```

This command selects the uplink frame synchronization source type.

SFN_RST This choice sets the signal to trigger on the system frame number reset signal.

FCLock This choice sets the signal to trigger on the frame clock.

***RST** FCL

Choices SFN_RST FCLock

Key Entry **Sync Source SFN FClk**

Remarks N/A

:ULINk:TGAP:POFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:POFFset <val>|AUTO
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:POFFset?
```

This command specifies the amount of power to be increased when the data is being compressed for the transmission gap power offset.

AUTO This choice sets the power to increase using the gap pattern parameters calculation based on 3GPP standard. When AUTO is selected, the query returns “AUTO” as the value.

The variable <val> is expressed in units of decibels (dB).

***RST** AUTO

Range 0–6

Choice AUTO

Field Entry PwrOffs

Remarks N/A

:ULINk:TGAP:PSI

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI?
```

This command sets the pattern sequence identifier.

***RST** 1

Range N/A

Key Entry TGPSI

Remarks There is only one transmission gap pattern sequence identifier available.

:ULINk:TGAP:PSI[1]:CFN

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:CFN <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:CFN?
```

This command sets the connection frame number (CFN) for the first radio frame of the first pattern 1.

***RST** 0

Range 1–255

Field Entry Stop CFN

Remarks In the signal generator, CFN is counted internally relative to the system sync signal.

:ULINk:TGAP:PSI[1]:CMMethod

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:CMMethod SF2|HIGHer
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:CMMethod?
```

This command selects the compressed mode (CM) method.

SF2 This choice selects a compressed mode method that reduced the spread factor (SF) by 2. This is done by increasing the data rate by reducing the spreading factor in half. When the dedicated physical data channel's

(DPDCH) symbol rate is 960 kbps, the frame is not compressed because it uses the lowest SF value and it cannot be reduced.

HIGHer This choice selects a higher layer scheduling method. The emulated higher layer scheduling method mode keeps the same physical layer data rate even when a transmission gap is created.

***RST** SF2

Choices SF2 HIGHer

Key Entry **SF/2 Higher Layer**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

The ULINk:APPLy command will fail if the CM method is higher layer and DPDCH data is TrCH. CM method should be SF/2 if the DPDCH data is TrCH.

:ULINk:TGAP:PSI[1]:D

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:D <val>|UNDefined
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:D?
```

This command sets the transmission gap distance. The command specifies the number of slots between the starting slots of two consecutive transmission gaps within a transmission gap pattern.

UNDefined This choice sets one transmission gap. When UNDefined is selected, then there is only one transmission gap within the transmission gap pattern.

***RST** UND

Range 15–269

Field Entry TGD

Remarks N/A

:ULINk:TGAP:PSI[1]:L1

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:L1 3|4|5|7|10|14
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:L1?
```

This command specifies the length of the first transmission gap (TGL1). The length is expressed in number of slots.

***RST** +7

Choices 3 4 5 7 10 14

Field Entry TGL1

Remarks N/A

:ULINk:TGAP:PSI[1]:L2

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:
L2 3|4|5|7|10|14|OMITted
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:L2?
```

This command specifies the length of the second transmission gap (TGL2).

The variable <val> is expressed in number of slots. When OMITted is selected, TGL2=TGL1.

***RST** OMIT

Choices 3 4 5 7 10 14 OMITted

Field Entry TGL2

Remarks N/A

:ULINk:TGAP:PSI[1]:PL1

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PL1 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PL1?
```

This command specifies the duration of the transmission gap pattern length 1 (TGPL1). The pattern length is expressed in number of frames.

***RST** +2

Range 1–144

Field Entry TGPL1

Remarks N/A

:ULINk:TGAP:PSI[1]:PL2

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PL2 <val>|OMITted
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PL2?
```

This command specifies the duration of the transmission gap pattern length 2 (TGPL2).

The variable <val> is expressed in number of frames. When OMITted is selected, TGPL2=TGPL1.

***RST** OMIT

Range 1–144

Choices <val> OMITted

Field Entry TGPL2

Key Entry Omitted

Remarks N/A

:ULINk:TGAP:PSI[1]:POWer

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:POWer?
```

This query returns each power level for a compressed slot.

The return string has five real numbers followed by dBm (for normal power) or dB (for before/after gap power) separated by a single space character. When a value does not exist because of a specified compressed pattern (Example: Gap2 does not exist when TGD is “UNDefined”), it returns “–dB.”

Normal power value represents an actual power level in dBm and relative power is represented in dB.

***RST** N/A

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:TGAP:PSI[1]:PRC

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PRC <val>|INFinity
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PRC?
```

This command sets the transmission gap pattern repetition count. The pattern repetition count (PRC) sets the number of transmission gap patterns within the transmission gap pattern sequence.

***RST** 1

Range 1–511

Choices <val> INFinity

Field Entry TGPRC

Key Entry **Infinity**

Remarks When INFinity is selected, the PRC will continue indefinitely.

:ULINk:TGAP:PSI[1]:PS

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PS ACTive|INACtive
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:PS?
```

This command sets the transmission gap pattern status.

ACTive This choice sets the compressed mode active.

INACtive This choice sets the compressed mode inactive.

***RST** INAC

Choices ACTive INACtive

Key Entry **TGPS Inactive Active**

Remarks N/A

:ULINk:TGAP:PSI[1]:SN

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:SN <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:PSI[1]:SN?
```

This command specifies the timeslot number of the first transmission gap within the first radio frame.

***RST** +11

Range 0–14

Field Entry TGSN

Remarks N/A

:ULINk:TGAP:RPARameter

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:
RPARameter DREF11|DREF12|DREF21|DREF22
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:RPARameter?
```

This command sets the downlink reference compressed mode parameters as defined in 3GPP Standard TS25.101.

DREF11 This choice sets the reference parameter to 1.1.

DREF12 This choice sets the reference parameter to 1.2.

DREF21 This choice sets the reference parameter to 2.1.

DREF22 This choice sets the reference parameter to 2.2.

***RST** CUST

Choices DREF11 DREF12 DREF21 DREF22

Key Entry **DL Reference 1.1** **DL Reference 1.2** **DL Reference 2.1** **DL Reference 2.2**

Remarks The query returns CUSTom when the parameters are set individually.

:ULINk:TGAP:SCFN

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:SCFN <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:SCFN?
```

This command sets the stop connection frame number (CFN) when the stop trigger is used.

When the stop trigger is received at the signal generator, the next stop CFN, the compressed mode will finish even if the transmission gap pattern repetition count (TGPRC) is still remaining.

***RST** +0

Range 0–255

Field Entry SCFN

Remarks The compressed mode stop trigger must be used for this command to executed. Refer to ":ULINk:TGAP:STOP:TRIGger" on page 908.

:ULINk:TGAP:STARt:TRIGger

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:STARt:TRIGger
```

This command starts the compressed mode trigger.

***RST** N/A

Range N/A

Key Entry Compressed Mode Start Trigger

Remarks N/A

:ULINk:TGAP:STARt:TRIGger:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:STARt:TRIGger:
POLarity POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:STARt:TRIGger:POLarity?
```

This command sets the compressed mode start trigger signal polarity.

POSitive This choice sets the trigger to start when the trigger signal is high.

NEGative This choice sets the trigger to start when the trigger signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **Comp Mode Start Trigger Polarity Neg Pos**

Remarks N/A

:ULINk:TGAP:STOP:TRIGger

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:STARt:TRIGger
```

This command stops the compressed mode trigger.

***RST** N/A

Range N/A

Key Entry **Compressed Mode Stop Trigger**

Remarks N/A

:ULINk:TGAP:STOP:TRIGger:POLarity

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:STOP:TRIGger:
POLarity POSitive|NEGative
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:STOP:TRIGger:POLarity?
```

This command sets the compressed mode stop trigger signal polarity.

POSitive This choice sets the trigger to stop when the trigger signal is high.

NEGative This choice sets the trigger to stop when the trigger signal is low.

***RST** POS

Choices POSitive NEGative

Key Entry **Comp Mode Stop Trigger Polarity Neg Pos**

Remarks N/A

:ULINk:TOFFset

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TOFFset <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TOFFset?
```

This command sets additional timing offset for the dedicated physical channel (DPCH). Timing offset is the time delay between the downlink signal and the uplink signal. The downlink signal timing is provided by the synchronization signal.

***RST** +0

Range –512 to 2560

Key Entry **Timing Offset**

Remarks The actual amount of timing offset is (T0) + (TOFFset) + (SDELay) where T0 = 1024 chips.

:ULINk:TSTatus:COMPressed

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TSTatus:COMPressed?
```

This query returns the status of compressed pattern generation.

A “0” response indicates the compressed mode pattern signal is not generating. A “1” response indicates that the compressed mode pattern signal is generating.

***RST** 0

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:TSTatus:RACH

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TSTatus:RACH?
```

This query returns the status of the physical random access channel (PRACH).

A “0” response indicates the PRACH signal is not generating. A “1” response indicates that the PRACH signal is generating.

***RST** 0

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:TSTatus:RECeive

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TSTatus:RECeive?`

This query returns the frame synchronization signal reception status.

When the frame synchronization signal is received after synchronization configuration, the received value becomes “1.” If the signal is not received, the value is “0.”

***RST** 0

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:TSTatus:SYNC

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TSTatus:SYNC?`

This query returns the frame synchronization status.

A “0” status indicates frame synchronization is fine or no frame synchronization signal is received). A “1” indicates frame synchronization is out sync and the synchronization signal does not match with the signal generator’s timing. The signal generator will generate incorrect data.

***RST** 0

Range N/A

Key Entry N/A

Remarks N/A

:ULINk:[TGRoup[1]]:DCH[1]|2|3|3|5|6:BLKSize

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:BLKSize <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:BLKSize?
```

This command sets the block size for the selected uplink dedicated channel (DCH).

***RST** +20

Range 0–5000

Key Entry Blk Size

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:BPFRame

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
BPFRame?
```

This query returns the block per frame for the selected dedicated transport channel (DCH).

***RST** *DCH1*: 490 *DCH2*: 110 *DCH3,4,5,6*: 60

Range 0–5000

Key Entry N/A

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:BRATe

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
BRATe?
```

This query returns the bit rate for the selected dedicated transport channel (DCH).

***RST** *DCH1*: 12200 *DCH2*: 2500 *DCH3,4,5,6*: 2000

Range 0–5000

Key Entry N/A

Remarks N/A

:ULINk:[TGRoup[1]]:DCH[1]|2|3|3|5|6:CODE

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:CODE HCONv|TCONv|TURBo|NONE
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:CODE?
```

This command sets the encoder type for the uplink dedicated channel (DCH) selected.

HCONv This choice selects a coding with the 1/2 rate convolutional encoder.

TCONv This choice selects a coding with the 1/3 rate convolutional encoder.

TURBo This choice selects a coding with the turbo coder.

NONE This choice selects no coding type.

***RST** *DCH1,2*: TCONv *DCH3,4,5,6*: HCONv

Choices HCONv TCONv TURBo NONE

Key Entry **1/2 Conv** **1/3 Conv** **Turbo** **NONE**

Remarks N/A

:ULINk:[TGRoup[1]]:DCH[1]|2|3|3|5|6:CRC

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:CRC 0|8|12|16|24
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:CRC?
```

This command specifies the number of cyclic redundancy code (CRC) bits to be added to each transport channel block.

***RST** 8

Choices 0 8 12 16 24

Field Entry `CRC Size`

Remarks N/A

:ULINk:[TGRoup[1]]:DCH[1]|2|3|3|5|6:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:DATA PN9|FIX4|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:DATA?
```

This command configures the data type to be inserted into the selected uplink dedicated channel (DCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9

Choices PN9 FIX4 "<file name>"

Key Entry **PN9** **FIX4** **User File**

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:BER:ACTual

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|
2|3|4|5|6:DATA:BER:ACTual?
```

This query returns the actual inserted error ratio in the uplink dedicated channel (DCH) selected.

***RST** +0.0000000E+000

Range N/A

Key Entry N/A

Remarks The actual bit error rate can be different from the specified bit error rate due to the internal bit generation.

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:BER:ERRor:BIT

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:BER:ERRor:BIT?
```

This query returns the actual error bits inserted in total number of bits.

***RST** +0

Range N/A

Field Entry Error Bits

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:BER:TOTal:BIT

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:BER:TOTal:BIT?
```

This query returns the total number of bits inserted for the bit error ratio calculation.

***RST** 0

Range N/A

Field Entry Total Bits

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:BER[:VALue]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:BER[:VALue] <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:BER[:VALue]?
```

This command specifies the bit error rate (BER) value to be inserted into the selected uplink dedicated channel (DCH).

The variable <val> is expressed in decimal form, but it is a percent ratio (1.0=100%).

***RST** 0.0000000+000

Range 0.0001–1.0

Field Entry BER

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:BLER:ACTual

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|
2|3|4|5|6:DATA:BLER:ACTual?
```

This query returns the actual block error ratio inserted.

***RST** 0.0000000E+000

Range N/A

Field Entry N/A

Remarks The actual block error rate can be different from the specified block error rate due to the internal bit generation.

:ULINk[:TGRoup[1]|2:DCH[1]|2|3|4|5|6:DATA:BLER:ERRor:BLOCk

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]|2:DCH[1]|2|3|4|5|6:
DATA:BLER:ERRor:BLOCk?
```

This query returns the number of error blocks inserted.

***RST** +0

Range N/A

Field Entry `Error Blocks`

Remarks N/A

:ULINk[:TGRoup[1]|2:DCH[1]|2|3|4|5|6:DATA:BLER:TOTal:BLOCk

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]|2:DCH[1]|2|3|4|5|6:
DATA:BLER:TOTal:BLOCk?
```

This query returns the error blocks actually inserted in total number of blocks.

***RST** +0

Range N/A

Field Entry `Total Blocks`

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:BLER[:VALue]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:BLER[:VALue] <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:BLER[:VALue]?
```

This command specifies the block error rate (BLER) value to be inserted into the selected uplink dedicated channel (DCH).

The variable <val> is expressed in decimal form, but it is a percent ratio (1.0=100%).

***RST** +0.00000000E+000

Range 0.0–1.00

Field Entry BLER

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:EINSert

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:EINSert BLER|BER|NONE
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:EINSert?
```

This command selects the error insertion mode.

BLER This choice selects a block error rate (BLER) mode.

BER This choice selects a bit error rate (BER) mode.

NONE This choice selects no BLER or BER mode (no error blocks or bits inserted).

***RST** NONE

Choices BLER BER NONE

Key Entry **BLER** **BER** **None**

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
DATA:FIX4?
```

This command sets the 4 bit data pattern for the selected uplink dedicated channel (DCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Key Entry FIX4

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:NBLock

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
NBLock <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
NBLock?
```

This command specifies the number of transport blocks coded on to the selected dedicated channel (DCH).

***RST** +1

Range 0–4095

Field Entry Num of Blk

Remarks N/A

:ULINk[:TGRoup [1]]:DCH[1]|2|3|4|5|6:PPERcentage

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
PPERcentage?
```

This query returns the percentage of the total bits removed from or added to the fully coded channel.

The value is returned in the unit of percent and a negative value means repetition.

***RST** N/A

Range N/A

Field Entry `Puncture`

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:RMATch

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
RMATch <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
RMATch?
```

This command specifies the rate matching parameters of each dedicated channel (DCH) selected.

***RST** +1

Range 1–256

Field Entry `Rate Match Attr`

Remarks N/A

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:TTI

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:
TTI 10000|20000|40000|80000
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6:TTI?
```

This command sets the transmission time interval (TTI) period for the dedicated channel

(DCH) selected. TTI is the time interval of the amount of data to be transmitted.

The choices are expressed in units of milliseconds (msec) where 20000 = 20 msec.

***RST** *DCH1*: 20000 *DCH2*: 40000 *DCH3,4,5,6*: 10000

Choices 10000 20000 40000 80000

Field Entry TTI

Remarks The data amount equals the block size (BLKsize) times the number of transport blocks (NBlock).

:ULINk[:TGRoup[1]]:DCH[1]|2|3|4|5|6[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|
2|3|4|5|6[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:DCH[1]|
2|3|4|5|6[:STATe]?
```

This command enables or disables the operating state of the dedicated channel (DCH) selected.

***RST** 0

Choices ON OFF 1 0

Key Entry **TrCH State Off On**

Remarks N/A

:ULINk[:TGRoup[1]]:RACH[1]:BLKSize

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:BLKSize <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:BLKSize?
```

This command sets the transport block size for the random access channel (RACH) coding where the input data is carried.

***RST** +168

Range 0–5000

Field Entry Blk Size

Remarks If the parameter set by this command is changed while the signal is

active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup [1]]:RACH[1]:BPFRame

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:BPFRame?`

This query returns the bits per frame for the selected random access channel (RACH).

***RST** +600

Range N/A

Key Entry N/A

Remarks N/A

:ULINk[:TGRoup [1]]:RACH[1]:BRATe

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:BRATe?`

This query returns the bit rate for the random access transport channel (RACH).

***RST** +8400

Range N/A

Key Entry N/A

Remarks N/A

:ULINk[:TGRoup[1]]:RACH[1]:CODE

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:CODE?`

This query returns the type of channel coding for error protection.

***RST** HCON

Range N/A

Key Entry N/A

Remarks N/A

:ULINk[:TGRoup[1]]:RACH[1]:CRC

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:
CRC 0|8|12|16|24
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:CRC?
```

This command specifies the number of cyclic redundancy code (CRC) bits that are to be added to each transport channel block.

***RST** +16

Choices 0 8 12 16 24

Field Entry `CRC Size`

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup[1]]:RACH[1]:DATA

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA PN9|
FIX4|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA?
```

This command sets the type of data to be inserted into the random access channel (RACH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

***RST** PN9

Choices PN9 FIX4 "<file name>"

Key Entry **PN9** **FIX4** **User File**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER:ACTual

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER:ACTual?`

This query returns the actual error ratio inserted.

***RST** +0

Range 0–5000

Key Entry **Actual BER**

Remarks The specified error ratio and actual ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER:ERRor:BIT

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER:ERRor:BIT?`

This query returns the actual error bits inserted for the total number of bits.

***RST** N/A

Range N/A

Key Entry N/A

Remarks N/A

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER:TOTal:BIT

Supported All with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER:TOTal:BIT?`

This query returns the total number of bits inserted for the bit error ratio calculation.

***RST** 0

Range N/A

Key Entry N/A

Remarks The specified error ratio and actual ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BER[:VALue]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BER[:VALue] <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BER[:VALue]?
```

This command sets the bit error rate value for the random access channel (RACH).

***RST** +0.00000000E+000

Range 0.0000–1.0

Field Entry BER

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINk:APPLy” on page 820.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BLER:ACTual

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BLER:ACTual?
```

This query returns the actual error ratio inserted.

***RST** 0.0000000E+000

Range N/A

Key Entry N/A

Remarks The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BLER:ERRor:BLOCk

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BLER:ERRor:BLOCk?
```

This query returns the actual block errors inserted in the total number of blocks.

***RST** +0

Range N/A

Key Entry N/A

Remarks The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BLER:TOTal:BLOCk

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BLER:TOTal:BLOCk?
```

This query returns the total blocks inserted for the block error ratio calculation.

***RST** +0

Range N/A

Key Entry N/A

Remarks The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:BLER[:VALue]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BLER[:VALue] <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
BLER[:VALue]?
```

This command sets the inserted block error rate value.

The variable <val> is expressed in decimal form, but it is a percent ratio (1.0=100%).

***RST** 0

Range 0.0001–1.0

Field Entry BLER

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:EINSert

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
EINSert BLER|BER|NONE
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:EINSert?
```

This command selects an error mode or no error insertion.

BLER This choice selects block error rate (BLER) mode.

BER This choice selects a bit error rate (BER) mode.

NONE This choice selects no BLER or BER mode (no error blocks or bits inserted).

***RST** NONE

Choices BLER BER NONE

Key Entry **BLER** **BER** **None**

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup[1]]:RACH[1]:DATA:FIX4

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:
FIX4 <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:DATA:FIX4?
```

This command sets a fixed 4 bit pattern for use as a data pattern.

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary units.

***RST** #B0000

Range 0–15

Field Entry Data

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup[1]]:RACH[1]:NBLock

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:NBLock <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:NBLock?
```

This command sets the number of transport blocks coded into one random access channel (RACH).

***RST** +1

Range 0–4095

Field Entry Num of Blk

Remarks The total input data into one RACH is the block size (BLKsize) multiplied by the number of transport blocks (NBLock).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820

:ULINk[:TGRoup [1]]:RACH[1]:PPERcentage

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:PPERcentage?
```

This query returns the percentage of the total bits removed from or added to the fully coded channel.

***RST** –2.12500000E+002

Range N/A

Field Entry Puncture

Remarks N/A

:ULINk[:TGRoup[1]]:RACH[1]:RMATch

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RACH[1]:RMATch?
```

This query returns the rate match parameters of each random access channel (RACH).

***RST** +1

Range N/A

Key Entry N/A

Remarks N/A

:ULINk[:TGRoup[1]]:RACH[1]:TTI

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:
TTI 10000|20000
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:TTI?
```

This command sets the transmission time interval (TTI) period for the random access channel (RACH).

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

***RST** 20000

Choices 10000 20000

Field Entry TTI

Remarks If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to ":ULINk:APPLy" on page 820.

:ULINk[:TGRoup[1]]:RACH[1][:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1][:STATe]?
```

This query returns the state of the random access channel (RACH).

***RST** 1

Range N/A

Key Entry N/A

Remarks N/A

[:STATe]

Supported All with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG][:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG][:STATe]?
```

This command enables or disables W-CDMA functionality.

***RST** 0

Choices ON OFF 1 0

Key Entry **W-CDMA Off On**

Remarks N/A

B

C

F

G

I

L

N

O

S

U