

**User's and Programming Guide**

**Agilent Technologies**

**ESG Family Signal Generators**

**Option 201 Real-Time cdma2000 Personality**

**Serial Number Prefixes**

(Affix Label Here)



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## **6. Programming Command Cross-Reference**

# 1 The Real-Time cdma2000 Personality

This guide provides information specific to the Option 201 real-time cdma2000 personality. This chapter contains an overview of Option 201.

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**NOTE** This option requires the installation of Option UN8 (hardware Revision C or greater), Real-Time Baseband Generator with TDMA Standards. Refer to the Option UN8 user's and programming guide for information.

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## Overview

The Option 201 personality provides real-time, fully coded signal solutions for IS-2000 with IS-95 backwards compatibility in both the forward (base station simulation) and reverse link (mobile simulation) modes. This option supports radio configurations (RC) 1–5 in forward link and RC1–4 for reverse link, with both modes using spread rate one (SR1). IS-95 is supported using RC1 or RC2 while IS-2000 features are supported using RC3–5. Long and short coding, cyclic redundancy checks, convolutional or turbo encoding, interleaving, power control, and complex scrambling are all supported. Additional capabilities allow flexible channel configurations with individually adjustable power levels and data rates, customizable user data, and variable chip rates.

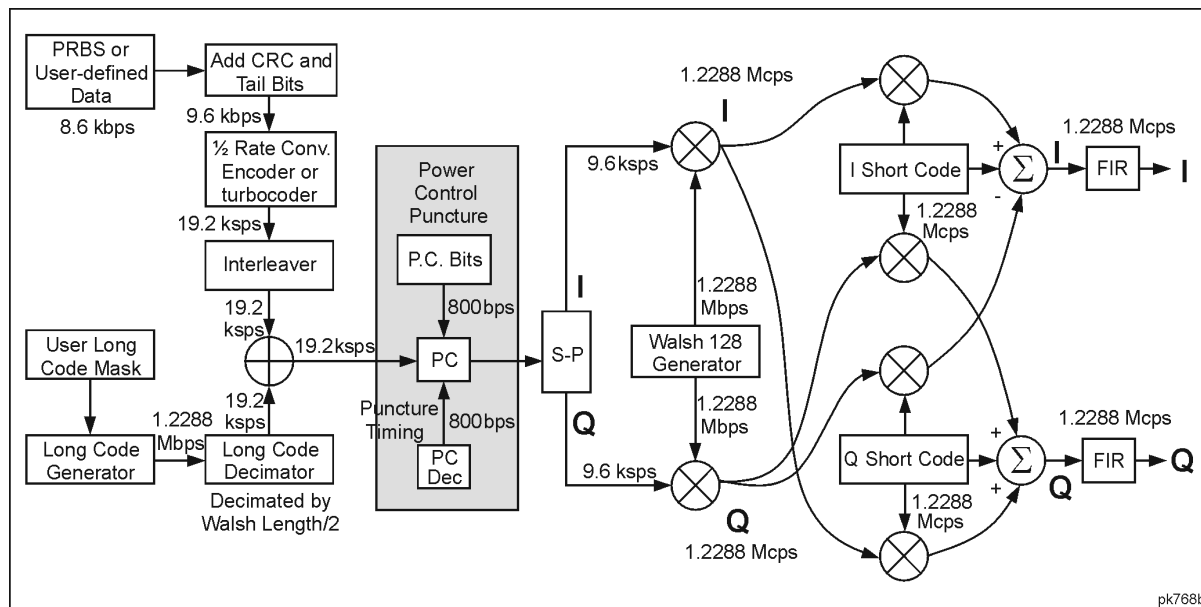
In order to provide IS-2000 test solutions, the Option 201 real-time cdma2000 personality requires that some of the BNC/SMB I/O connectors on the ESG function differently than what the connector labels state. These functionality changes are active only when using the Option 201 personality. For detailed descriptions of BNC I/O functionality, refer to “[Forward and Reverse Link I/O Signal Descriptions and Timing Relationships](#)” on page 4-9.

## Forward Link

The forward link mode simulates a base station transmitter and supports RC1–5 with SR1. There is a single-ESG solution for IS-95 receivers (RC1 or RC2) and a two-ESG solution for IS-2000 receivers (RC3–5). The two-ESG solution allows for a more complex signal structure. A single ESG can be used to transmit a partial IS-2000 signal with a limited number of channels.

Paging, sync, and pilot channels are supported. An RC4 forward traffic link, as supported by the personality, is shown in [Figure 1-1](#).

**Figure 1-1. Forward Coding Path for an IS-2000 SR1 RC4 Traffic Channel**



**Table 1-1 Forward Link Features by ESG Solution**

Description	1-ESG	2-ESG
Fully coded channels including pilot, sync, paging, quick paging, and fundamental and supplemental traffic channels	● <sup>1,2</sup>	●
Support for radio configurations 1–5	●	●
Incremental data rates up to 307.2 kbps		●
Full control of the paging message stream (overhead and signaling messages)	●	●
Supports both convolutional and turbo encoding	● <sup>3</sup>	●
Supports quasi-orthogonal functions 0–3	●	●
User data insertion via user files or external data	●	●
Variable chip rates, 50 Hz to 1.3 MHz	●	●
Fully configurable sync channel base station parameters	●	●
OCNS channels	●	●

1. IS-95 does not support quick paging.
2. One ESG can generate a group of channels including pilot, sync, paging, and RC1-RC2 fundamental or a group of channels including RC1-RC5 fundamental and RC3-RC5 supplemental channels. A single ESG cannot generate both groups of channels simultaneously.
3. IS-95 does not support turbo encoding.

## Reverse Link

The Option 201 reverse link supports RC1–4 with SR1 and allows the operator to test the base station using either a single- or a two-ESG solution. The single ESG solution is viable for both IS-95 and IS-2000. The two-ESG solution is only for the IS-2000 format; this allows an additional reverse supplemental channel (R-SCH).

In the reverse link mobile setup display, there is an adjustable `Trigger Advance` field that is used to synchronize the RF output of the ESG to the base station timing signal. Another field, `Trigger Edge`, allows the ESG to trigger on the positive or negative going transition of the base station timing signal. Both of these fields are used in all radio configurations.

IS-95 is supported using RC1 or RC2 which utilizes a single, selectable channel type:

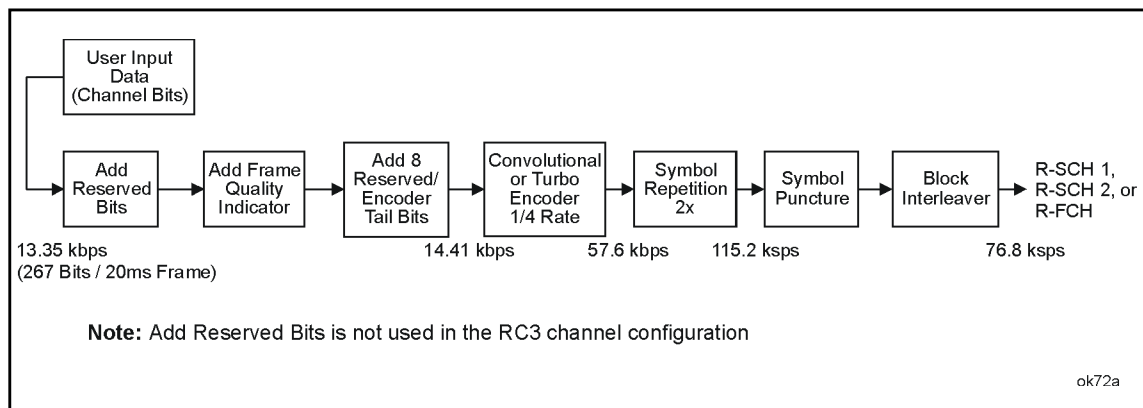
- reverse access control channel (R-ACH)
- reverse fundamental channel (R-FCH)
- reverse supplemental channel (R-SCH)

IS-2000 features are supported using RC3 or RC4 and can use up to four channels on one ESG and five total with the second ESG. The channel types consist of the following:

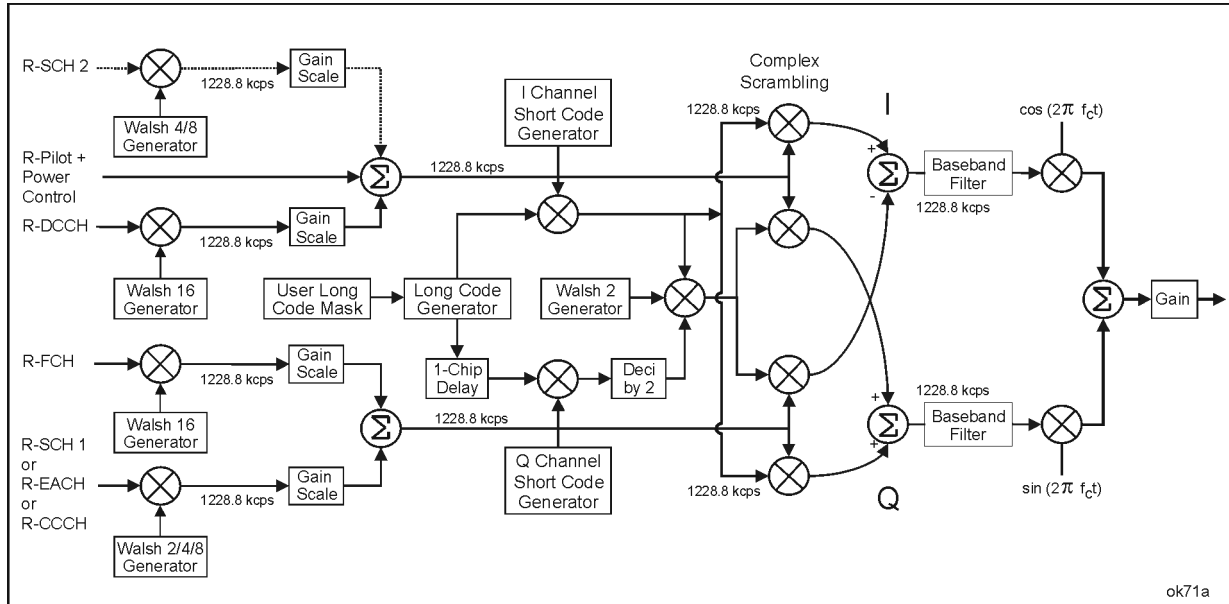
- reverse pilot channel (R-PICH) (with or without gating)
- reverse dedicated control channel (R-DCCH)
- reverse common control channel (R-CCCH)
- reverse enhanced access channel (R-EACH)
- reverse fundamental channel (R-FCH)
- reverse supplemental channel (R-SCH)

Figure 1-2. shows the reverse fundamental and supplemental channel structure for RC4 and Figure 1-3. shows the reverse channel spreading for RC3 and RC4, utilizing SR1 as implemented by the Option 201 personality.

**Figure 1-2. RC4 Reverse Fundamental and Supplemental Channel**



**Figure 1-3. RC3 and RC4, SR1 Reverse Link Spreading**



**Table 1-2. Reverse Link Features by Radio Configuration**

Description	RC1	RC2	RC3	RC4
IS-95 backwards compatible	●	●		
IS-2000 features			●	●
Pseudorandom number patterns	●	●	●	●
4-bit fixed data patterns	●	●	●	●
User defined data patterns	●	●	●	●
Incremental data rates up to 9.6 kbps	● <sup>1</sup>		● <sup>2</sup>	
Incremental data rates up to 14.4 kbps		● <sup>1</sup>		● <sup>3</sup>
High incremental data rates up to 307.2 kbps			● <sup>4</sup>	
High incremental data rates up to 230.4 kbps				● <sup>4</sup>
Power control bit settings			●	●
Adjustable frame offsets	●	●	●	●
Adjustable frame lengths			●	●
Convolutional encoding	●	●	●	●
Turbo encoding			●	●

1. The maximum data rate applies to the fundamental and supplemental channels.
2. The maximum data rate applies to the fundamental and dedicated control channels.
3. The maximum data rate applies to the fundamental channel.
4. The maximum data rate applies to the supplemental channel.

## 2 Using Functions

This chapter provides information on how to use functions that are unique to Option 201. You can configure Option 201 using either one or two signal generators for both forward and reverse link.

In this chapter, you will find individual sections for forward and reverse link. These sections provide information which will guide you through configuring a single-ESG solution, a two-ESG solution, and tests that can be performed. In addition, a troubleshooting section is included at the end of the chapter.

The material in this chapter is presented with the assumption that you have a working knowledge of both the ESG *and* CDMA and/or IS-2000.

For basic operating information, refer to the ESG quick start guide and user's guide.

For information on the operational theory of Option 201, refer to chapter 4.

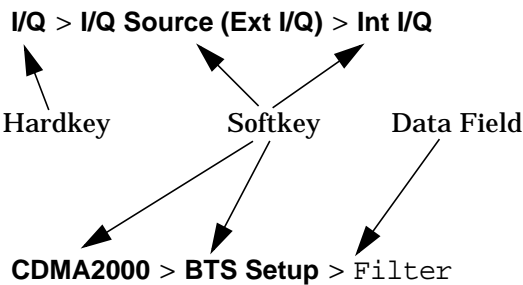
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**NOTE** In this manual, IS-2000 is equivalent to cdma2000.

References to preset refer to normal, factory preset conditions (**Utility > Power On/Preset > Normal**), *not* user preset.

Hardkeys and softkeys are denoted by **Bold** text; data fields within a setup editor are denoted by a different font. This is an example of what that font looks like: Computer Font.

Examples:





## Forward Link Test Configurations and Measurements

This section will demonstrate a single-ESG and a two-ESG test configuration while utilizing the E4406A VSA Transmitter Tester for taking measurements. (Refer to the E4406A VSA Transmitter Tester User's Guide and cdma2000 Measurement Guide for specific E4406A measurement information.) Included in this section, are examples of tests that can be performed with the Option 201 such as frame, block and bit error rate and how to create a paging message.

### Single-ESG Forward Link Configuration

This section will guide you through setting up the ESG using four IS-95 backwards compatible channels with real-time signal generation capability. The ESG output is measured using the E4406A VSA Transmitter Tester.

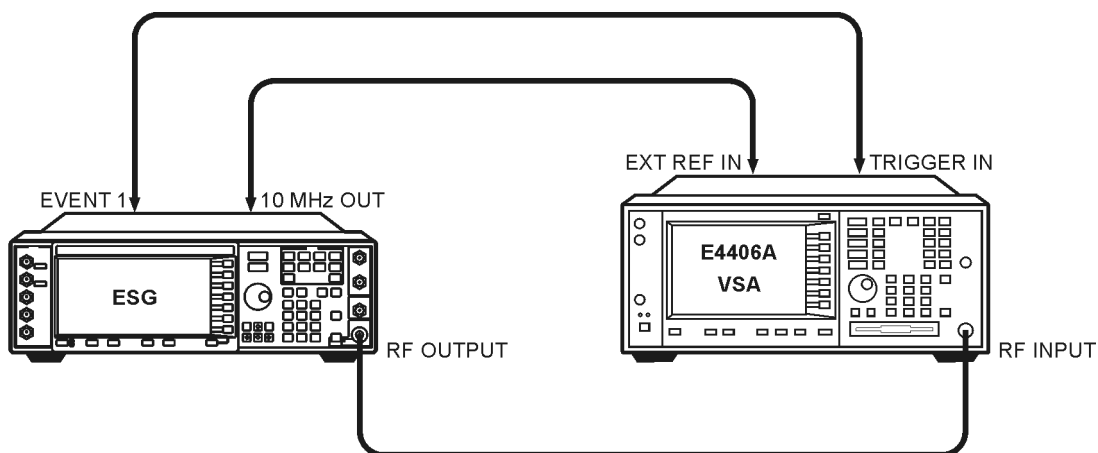
#### Required Equipment

- 1 Agilent Technologies ESG-D or ESG-DP Family Signal Generator with Options UN8 and 201
- 1 Agilent Technologies E4406A VSA Series Transmitter Tester with Option B78
- 3 BNC Cables
- 2 Type-N (m) to BNC (f) adapters

#### Single-ESG Forward Link Measurement Setup

1. Refer to Figure 2-1. and make the necessary connections between the ESG and the E4406A.

**Figure 2-1. Single-ESG Forward Link Measurement Setup**



ok73a

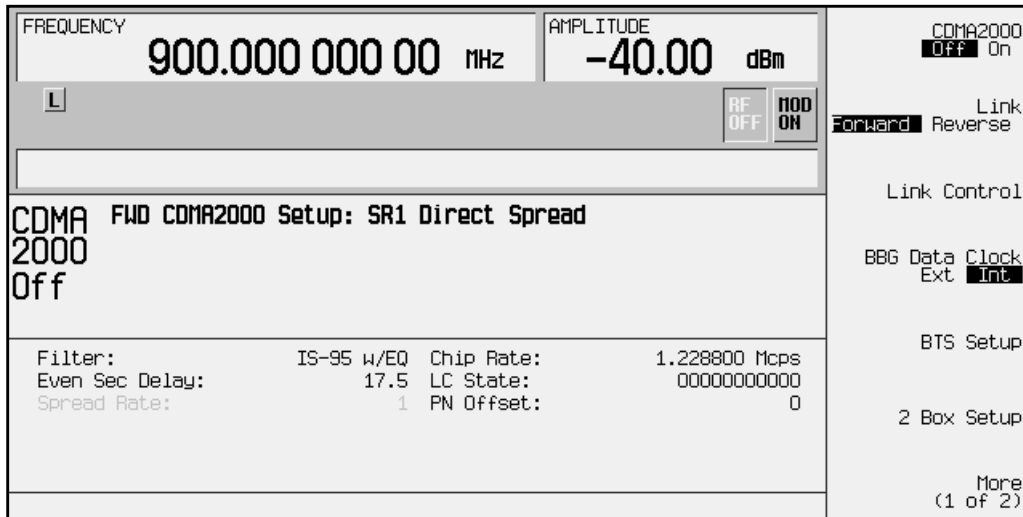
2. Turn on the ESG and the E4406A VSA.

### Configuring the Single-ESG for Forward Link

**NOTE** The following signal generator settings are used for example purposes. Change them as needed for your device under test (DUT).

1. Press **Preset** (factory defined, not user defined).
2. Press **Frequency > 900 > MHz** and then press **Amplitude > -40 > dBm**.
3. Press **Mode > Real-time I/Q BaseBand (if it appears) > CDMA > CDMA2000**.
4. Check that the following softkeys are set as indicated:  
**Link Forward Reverse: Forward** is highlighted  
**BBG Data Clock Ext Int: Int** is highlighted
5. Press **More (1 of 2)**.
6. Check that the following softkeys are set as indicated:  
**Phase Polarity Normal Invert: Normal** is highlighted  
**IQ Map Rotation Std. Rotated: Std.** is highlighted
7. Press **More (2 of 2)**.

The following figure displays the default values for the CDMA2000 forward link BTS setup data fields.



The following are brief descriptions of the available fields. Refer to Chapter 3 , “Softkey Reference,” for more detailed information on each field.

**NOTE** If a field is grayed out, it cannot be edited.

Filter	This displays the current filter being used. In addition to the standard filters (Root Nyquist, Nyquist, Gaussian and User FIR), the four IS-95 filters can be used with all radio configurations.
--------	--

Even Sec Delay	This displays the delay of data transmission relative to the internal data clock. This is measured in units of chips with a 0.5 chip resolution.
Spread Rate	This displays the spread rate being used and it cannot be changed.
Chip Rate	This displays the number of chips being spread and the amount of bandwidth being occupied.
LC State	This displays the value of the long code that is available in the shift register. Setting a value other than 0 seeds the long code. For no long code, set to 0000000000.
PN Offset	This displays the current pseudorandom number offset value. This is the time offset in the short sequence code assigned to each base station to give a unique identity.

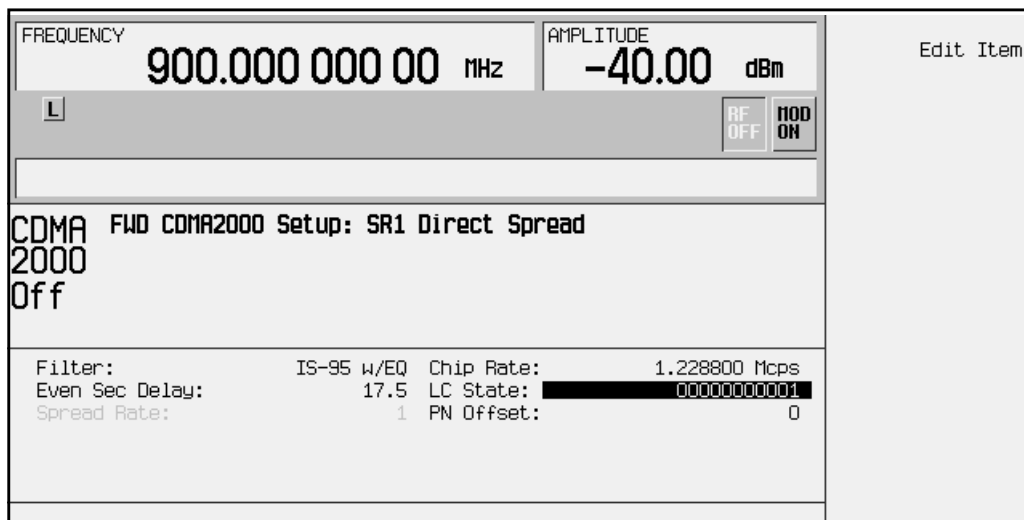
8. Press the **BTS Setup** softkey.

This opens the base transceiver station setup editor. The highlight bar can be moved by rotating the front panel knob or pressing the arrow keys.

9. Move the highlight bar to the **LC State** field and press **Edit Item**.

10. Press **1 > Enter**.

The following figure displays the current BTS setup field values that will be used in this example.



11. Press **Return**. The CDMA2000 menu is now displayed.

12. Press **Link Control**.

This accesses a channel control menu where the channels can be turned on or off, the channel type selected and parameters edited, and the code domain power adjusted.

13. Press the following key sequences to configure the individual channels, starting with channel one. The channel parameters are shown in Table 2-1.

---

**NOTE** The **Channel Number** softkey is always bold. This indicates that you do not have to press this softkey to change channel numbers. You can change channels by pressing the appropriate number and the **Enter** softkey, rotating the front panel knob, or using the arrow keys.

---

- **1** > Enter > Channel State Off On to On > Channel Setup > Power > -7 > dB > Return
- **2** > Enter > Channel State Off On to On > Channel Setup > Power > -13 > dB > Return
- **3** > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Walsh > 8 > Enter > Radio Config > 1 > Enter > Return
- **4** > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Return

**Table 2-1. Forward Link Single-ESG Channel Parameters for RC1**

Channel Number	Channel Type	Channel State	Channel Power	Walsh Code	Data	Data Rate
1	F-PICH	On	-7.0 dB	0	N/A	N/A
2	F-SYNCH	On	-13.0 dB	32	N/A	N/A
3	F-FCH	On	-10.0 dB	8	PN9	9.60000 kbps
4	F-PCH	On	-10.0 dB	1	DEFAULT	9.60000 kbps

14. Press **Adjust Code Domain Power** > **Scale To 0dB**.

Notice that the power levels have changed on each channel. This has scaled the channel power levels to the proper amplitudes for transmission (the sum log value of the new power levels equal zero). The power *ratios* between the channels remain unchanged.

---

**NOTE** Adjusting the code domain power works on active channels only.

---

15. Press **Return**. The CDMA2000 menu is now displayed.

16. Press **CDMA2000 Off On**. **On** is now highlighted and the CDMA2K and I/Q annunciators are displayed.

17. Check that the MOD ON annunciator is displayed on the ESG and press **RF On/Off**. The RF ON annunciator is now displayed.

## Configuring the E4406A VSA for a Single-ESG Forward Link Measurement

This section explains how to set up the E4406A VSA to display the forward link ESG parameters that were configured in the previous section.

Perform the following steps to show the code domain display:

1. Press **Preset**.
2. Set the VSA to use an external reference and ensure that it is set to 10 MHz.  
Press: **System > Reference > Freq Ref Int Ext**
  - a. Press **10 > MHz**.
  - b. Press the **Freq Ref Int Ext** softkey until **Ext** is underscored.
3. Choose the cdma2000 option.  
Press: **Mode > More (1 of 2) > cdma2000**
4. Set the VSA is set to receive a base station signal.  
Press: **Mode Setup > Radio > Device BTS MS to BTS**
5. Set the center frequency to 900 MHz.  
Press: **Frequency > 900 > MHz**
6. Set the display span to view the full modulated signal.  
Press: **SPAN > 1.8 > MHz**
7. Select the code domain measurement.  
Press: **Measure > More (1 of 2) > Code Domain**
8. Set the VSA display for a Walsh code length of 128.  
Press: **Display > Base Code Length 64 128 to 128**

This allows the F-SYNCH channel indicator to be shown in red. With the **Base Code Length 64 128** softkey set to **64**, the F-SYNCH channel is shown as yellow.
9. Set the VSA to trigger on a rear external source.  
Press: **Meas Setup > More (1 of 3) > More (2 of 3) > Trig Source > Ext Rear**
10. Press **Restart**.

This allows the VSA to take another single sweep measurement after all settings have been implemented.
11. Position a marker to read a channel.
  - a. Press the **Marker** hardkey.
  - b. Rotate the front panel knob to position the marker.

The marker displays a channel's Walsh code spread factor, Walsh code, symbol rate, and power level (indicated as Channel Marker Information on the figure).

12. Set the VSA to measure continuously.

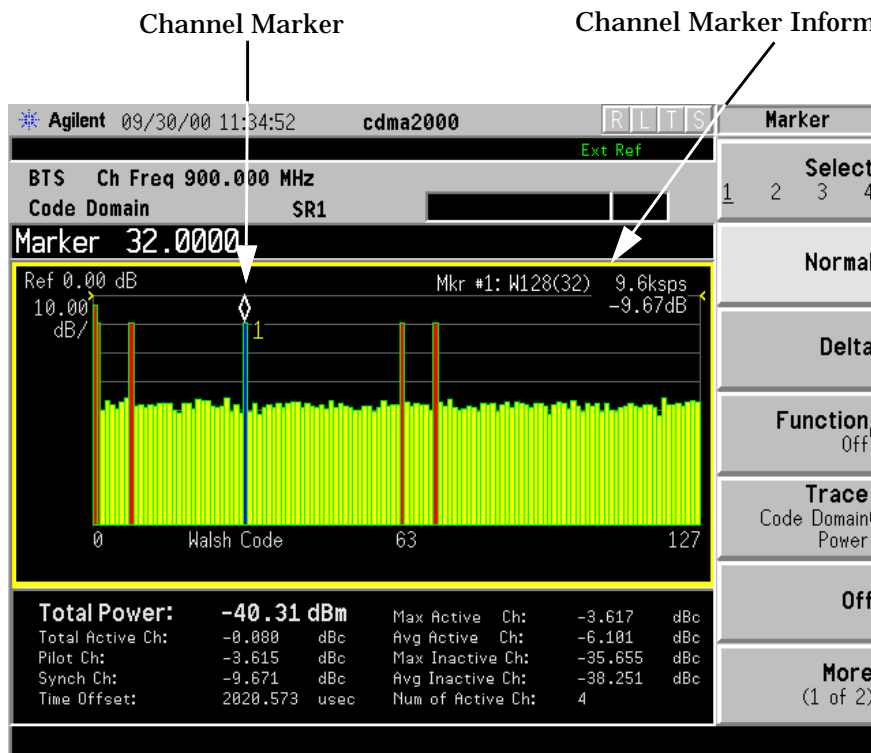
Press: **Meas Control > Measure Single Cont to Cont**

---

**NOTE** The marker is easier to position when the VSA is set to measure a single sweep.

---

The following figure of the vector signal analyzer display illustrates that the code domain power levels shown on the ESG after scaling and adjusting the code domain power match those shown on the vector signal analyzer.



### Using this Setup with a CDMA Mobile Phone

To connect to a CDMA mobile phone, (because the ESG does not support bidirectional protocol handling) place the mobile phone in a test mode which enables it to process messages without full handshaking.

## Two-ESG Forward Link Configuration

This configuration provides more real-time CDMA channels, power levels, and higher radio configurations than a setup using only one signal generator. In addition, using two ESGs provides two RC3, RC4 or RC5 traffic channels, enabling you to test IS-2000 receiver designs.

The following example configures an IS-2000 stimulus containing pilot, synch, OCNS, and paging channels, as well as a fundamental and supplemental RC4 traffic channel.

### Required Equipment

- 2 Agilent Technologies ESG-D or ESG-DP Family Signal Generators with Options UN8 and 201
- 1 Agilent Technologies E4406A VSA Series Transmitter Tester with Option B78
- 12 BNC cables (See note prior to setup drawing for length requirements)
- 3 BNC tee splitters
- 3 Type-N (m) to BNC (f) adapters

### Two-ESG Forward Link System Configuration Process

The two-ESG system configuration process is divided into the following subsections:

- [“Two-ESG Forward Link Measurement Setup”](#) on page 2-9
- [“Configure ESG 1 for Forward Link”](#) on page 2-10
- [“Configure ESG 2 for Forward Link”](#) on page 2-12
- [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15
- [“Generate the Signal at the RF Output \(Two-ESG Forward Link\)”](#) on page 2-17
- [“Configuring the E4406A VSA for the Two-ESG Forward Link Measurement”](#) on page 2-18

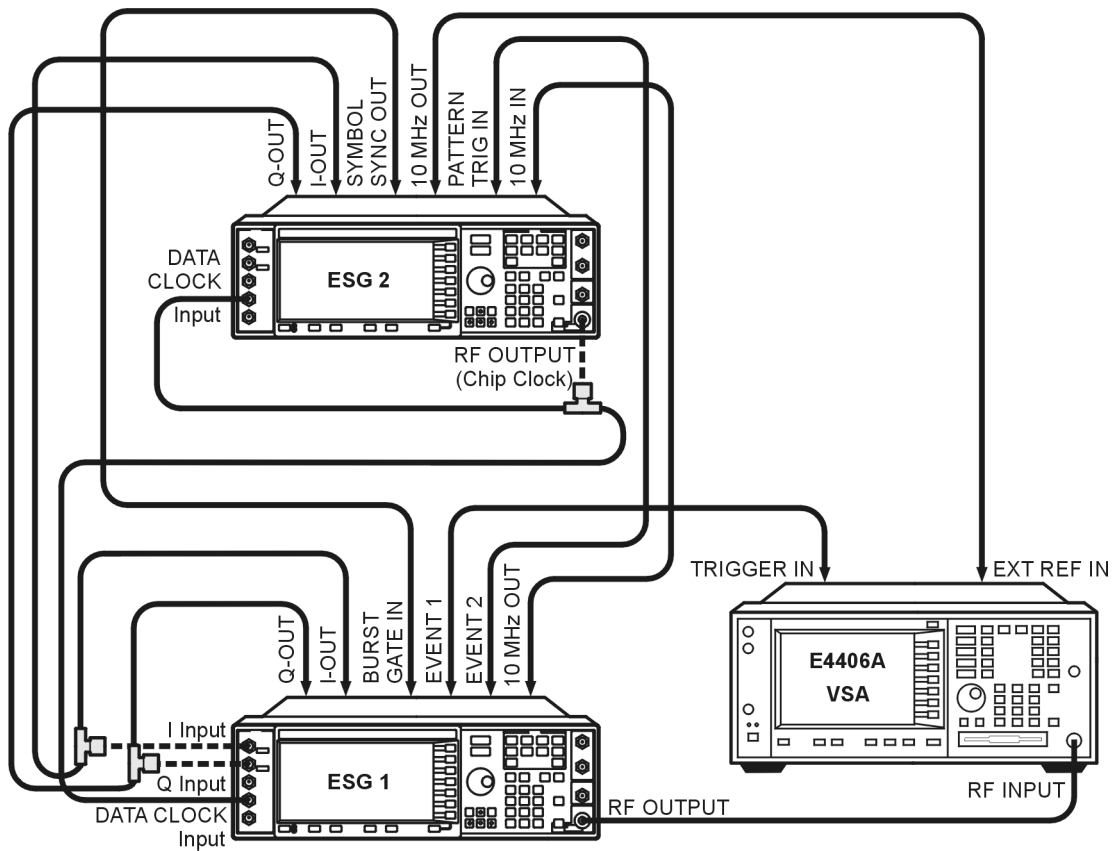
### Two-ESG Forward Link Measurement Setup

1. Refer to the Figure 2-2. and connect the two ESGs and the E4406A VSA Transmitter Tester as shown.

**NOTE** The following connections require short cables of equal length to reduce phase difference:

Data Clock ESG 1 and ESG 2 Input to RF Output on ESG 2  
I Out and Q Out ESG 2 to I Input and Q Input on ESG 1  
I Out and Q Out ESG 1 to I Input and Q Input on ESG 1

**Figure 2-2. Two-ESG Forward Link Measurement Setup**



ok75a

2. Turn on the signal generators and the E4406A VSA.

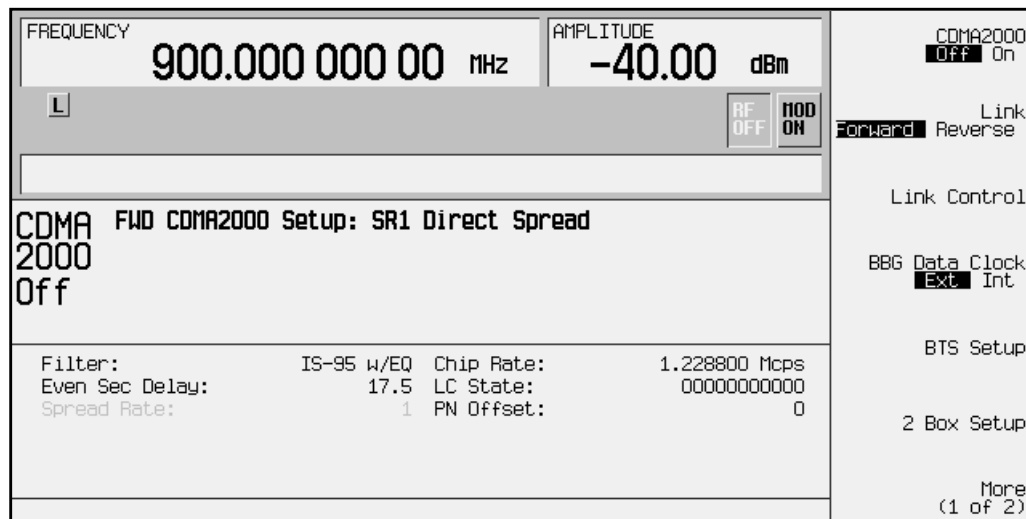


## Configure ESG 1 for Forward Link

**NOTE** The following signal generator settings are used for example purposes. Change them as needed for your device under test (DUT).

1. Press **Preset** (factory defined not user defined).
2. Press **Frequency** > **900** > **MHz** and then press **Amplitude** > **-40** > **dBm**.
3. Press **Mode** > **Real-time I/Q BaseBand** (if it appears) > **CDMA** > **CDMA2000**.
4. Check that **Forward** is highlighted on the **Link Forward Reverse** softkey.
5. Press **BBG Data Clock Ext Int**. **Ext** is now highlighted.
6. Press **More** (1 of 2).
7. Check that the following softkeys are set as indicated:  
**Phase Polarity Normal Invert: Normal** is highlighted  
**IQ Map Rotation Std. Rotated: Std.** is highlighted
8. Press **More** (2 of 2).

The following figure displays the default values for the CDMA2000 forward link BTS setup data fields for ESG 1.



The following are brief descriptions of the available fields. Refer to Chapter 3, “Softkey Reference,” for more detailed information on each field.

**NOTE** If a field is grayed out, it cannot be edited.

Filter	This displays the current filter being used. In addition to the standard filters (Root Nyquist, Nyquist, Gaussian and User FIR), the three IS-95 filters can be used with all radio configurations.
--------	---

Even Sec Delay	This displays the delay of data transmission relative to the internal data clock. This is measured in units of chips with a 0.5 chip resolution.
Spread Rate	This displays the spread rate being used and it cannot be changed.
Chip Rate	This displays the number of chips being spread and the amount of bandwidth being occupied.
LC State	This displays the value of the long code that is available in the shift register. Setting a value other than 0 seeds the long code. For no long code, set to 00000000000.
PN Offset	This displays the current pseudorandom number offset value. This is the time offset in the short sequence code assigned to each base station to give a unique identity.

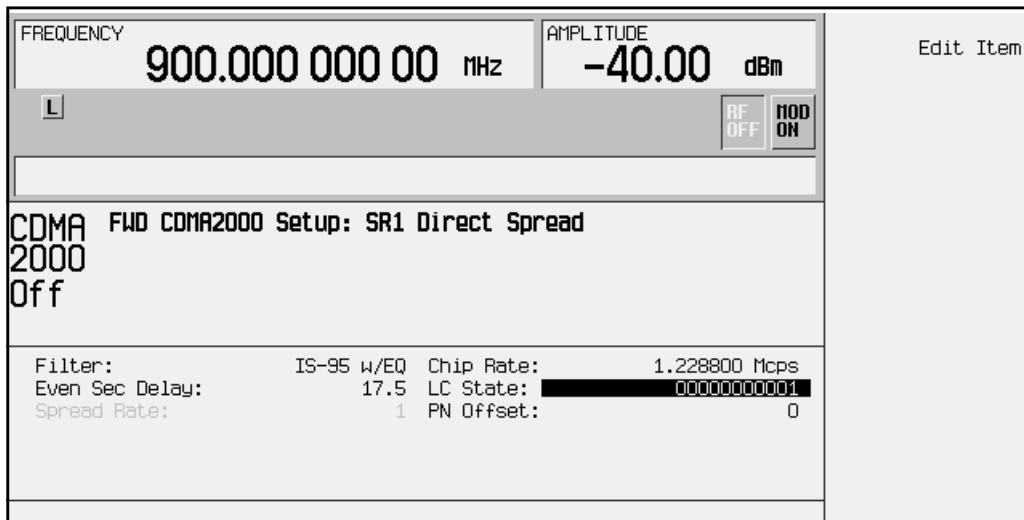
9. Press the **BTS Setup** softkey.

This opens the base transceiver station setup editor. The highlight bar can be moved by rotating the front panel knob or pressing the arrow keys.

10. Move the highlight bar to the **LC State** field and press **Edit Item**.

11. Press **1 > Enter**.

The following figure displays the current BTS setup field values that will be used in this example for ESG 1.



12. Press **Return** to open the CDMA2000 menu.

13. Press **Link Control**.

This accesses a channel control menu where the channels can be turned on or off, the channel type selected and parameters edited and the code domain power adjusted.

14. Press the following key sequences to configure the individual channels, starting with channel one. The channel parameters are shown in Table 2-2.

---

**NOTE** The **Channel Number** softkey is always bold. This indicates that you do not have to press this softkey to change channel numbers. You can change channels by pressing the appropriate number and the **Enter** softkey, rotating the front panel knob, or using the arrow keys.

---

- **1** > **Enter** > **Channel State to On** > **Channel Setup** > Power > -7 > dB > Return
- **2** > **Enter** > **Channel Type to F-SYNCH** > **Channel State Off On to On** > **Channel Setup** > Power > -13 > dB > Return
- **3** > **Enter** > **Channel Type F-FCH OCNS to OCNS** > **Channel State Off On to On** > **Channel Setup** > Power > -3.46 > dB > Walsh > 57 > Enter > Return
- **4** > **Enter** > **Channel Type > F-PCH** > **Channel State to On** > **Channel Setup** > Power > -10 > dB > Return

**Table 2-2. ESG 1 Channelization Parameters**

Channel Number	Channel Type	Channel State	Channel Power	Walsh Code	Data Rate
1	F-PICH	On	-7.0 dB	0	N/A
2	F-SYNCH	On	-13.0 dB	32	N/A
3	OCNS	On	-3.46 dB	57	N/A
4	F-PCH	On	-10.0 dB	1	9.60000 kbps

15. Press Return to open the CDMA2000 menu.

### Configure ESG 2 for Forward Link

In addition to sourcing part of the CDMA signal, ESG 2 is used as the data clock for both ESGs.

1. Press **Preset** (factory defined not user defined).
2. Press **Ampl** > **ALC Off On**. **Off** is now highlighted.

The automatic leveling control is turned off when two ESGs are used together.

3. Press **Frequency** > **1.2288** > **MHz** and then press **Amplitude** > **20** > **dBm**.

This sets ESG 2 to be used as the chip clock and sets the amplitude to provide near TTL voltages to drive the data clock.

4. Press **Mod On/Off**. The **MOD OFF** annunciator is now displayed.
5. Press **Mode** > **Real-time I/Q BaseBand** (if it appears) > **CDMA** > **CDMA2000**.
6. Check that **Forward** is highlighted on the **Link Forward Reverse** softkey.

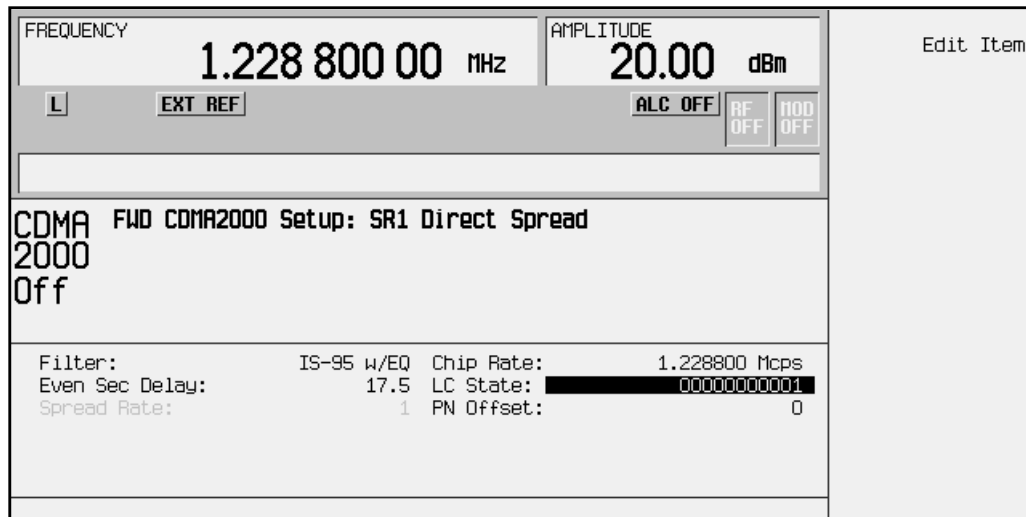
7. Press **BBG Data Clock Ext Int**. **Ext** is now highlighted.
8. Press **More (1 of 2)**.
9. Press **Phase Polarity Normal Invert**. **Invert** is now highlighted.
10. Check that **Std.** is highlighted on the **IQ Map Rotation Std. Rotated** softkey.
11. Press **More (2 of 2)**.

The following figure displays the default values for the CDMA2000 forward link BTS setup data fields for ESG 2.



12. Press the **BTS Setup** softkey.
13. Move the highlight bar to the **LC State** field and press **Edit Item**.
14. Press **1 > Enter**.

The following figure displays the current BTS setup field values that will be used in this example for ESG 2.



15. Press **Return** to open the CDMA2000 menu.

16. Press **Link Control**.

17. Press the following key sequences to configure the individual channels. The channel parameters are shown in Table 2-3.

- **3 > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Radio Config > 4 > Enter > Return**
- **4 > Enter > Channel Type > F-SCH > Channel State Off On to On > Channel Setup > Power > -10 > dB > Walsh > 4 > Enter > Radio Config > 4 > Enter > Data Rate > 153.6 kbps > Return**

**Table 2-3. ESG 2 Channelization Parameters for RC4**

Channel Number	Channel Type	Channel State	Channel Power	Walsh Code	Radio Config	Data Rate
1	F-PICH	Off	N/A	N/A	N/A	N/A
2	F-SYNCH	Off	N/A	N/A	N/A	N/A
3	F-FCH	On	-10.0 dB	10	4	9.60000 kbps
4	F-SCH	On	-10.0 dB	4	4	153.600 kbps

---

**NOTE** Due to hardware limitations, I/Q mapping can only support two channels with radio configurations greater than 2. Therefore, ESG 2 has only two active channels in this configuration.

---

18. Press **Return**. This opens the CDMA2000 menu.

### Adjust the Relative Power Mapping (Two-ESG Forward Link)

Once the signal generators are configured as described in the previous sections, use the following steps to perform the relative power mapping procedure. Relative power mapping assures proper channel power levels between the two ESGs and an overall code domain power of 0 dB. For more information, see “[Forward and Reverse Link Relative Power Mapping](#).” on page 4 -16.

1. Return to the CDMA2000 menu and press **2 Box Setup** on both ESGs.
2. Refer to the following figures. Highlight the Voltage Other ESG data field on ESG 1 and enter the Voltage This ESG value from ESG 2. Press **V** to terminate the entry.

The individual ESG voltage adjustments are made to align the channel voltages between the signal generators. This in turn adjusts the I/Q voltage scale. While this scales the channels relative to each other, it does not ensure the 0 dBm power level required for the code domain. This will be done later in the process.

3. Highlight the Voltage Other ESG data field on ESG 2 and enter the Voltage This ESG value from ESG 1. Press **V** to terminate the entry.

Notice that the IQ Voltage Scale value has changed on ESG 2.

**ESG 2**

FREQUENCY	1.228 800 00 MHz	AMPLITUDE	20.00 dBm	Edit Item
EXT REF		ALC OFF	RF OFF	MOD OFF
Scale To 0dB				
CDMA FWD CDMA2000 Setup: SR1 Direct Spread				
Off				
Voltage This ESG:	0.632456 V	% Power This ESG:	0.200000	
Voltage Other ESG:	1.658212 V	% Power Other ESG:	8.000000	
IQ Voltage Scale:	-4.19 dB			

a. Enter this value here.

b. Enter this value here.

**ESG 1**

FREQUENCY	900.000 000 00 MHz	AMPLITUDE	-40.00 dBm	Edit Item
L		RF OFF	MOD ON	Scale To 0dB
CDMA FWD CDMA2000 Setup: SR1 Direct Spread				
Off				
Voltage This ESG:	1.658212 V	% Power This ESG:	0.800462	
Voltage Other ESG:	0.632456 V	% Power Other ESG:	0.000000	
IQ Voltage Scale:	0.00 dB			

4. Refer to the following figures. Highlight the % Power Other ESG data field on ESG 1 and enter the % Power This ESG value from ESG 2. Press **Enter** to terminate the entry.

The percent power adjustment sets the parameters that will allow the scale to 0 dB function to scale all channels to 0 dB. This aligns the displayed power of both ESGs to match the code domain measurement values on the transmitter tester.

5. Highlight the % Power Other ESG: data field on ESG 2 and enter the % Power This ESG value from ESG 1. Press **Enter** to terminate the entry.

**ESG 2**

FREQUENCY: 1.228 800 00 MHz      AMPLITUDE: 20.00 dBm

EXT REF      ALC OFF      RF OFF      MOD OFF

CDMA FWD CDMA2000 Setup: SR1 Direct Spread  
 2000  
 Off

Voltage This ESG: 0.632456 V      % Power This ESG: 0.200000  
 Voltage Other ESG: 1.658212 V      % Power Other ESG: 0.800462  
 IQ Voltage Scale: -4.19 dB

a. Enter this value here.      b. Enter this value here.

**ESG 1**

FREQUENCY: 900.000 000 00 MHz      AMPLITUDE: -40.00 dBm

RF OFF      MOD ON

CDMA FWD CDMA2000 Setup: SR1 Direct Spread  
 2000  
 Off

Voltage This ESG: 1.658212 V      % Power This ESG: 0.800462  
 Voltage Other ESG: 0.632456 V      % Power Other ESG: 0.200000  
 IQ Voltage Scale: 0.00 dB

a. Enter this value here.      b. Enter this value here.

6. Press **Scale to 0dB** on both ESGs.

The voltage and power values may change to reflect the adjusted power levels.

---

**NOTE**      Pressing **Scale to 0dB** on both ESGs scales the individual channel power levels so that the *sum of the code domain power generated by both ESGs* equals 0 dB. This does not change the total power, as set by the **Amplitude** key.

---

7. Press **Return** on both ESGs to open the CDMA2000 menu.

### Generate the Signal at the RF Output (Two-ESG Forward Link)

This section describes the proper order that must be used to turn on the RF output and the Option 201 (cdma2000 personality). If for any reason the signal from ESG 2 is interrupted, whether by turning off the RF output, cdma2000 personality or ESG power, then the following process must be repeated.

1. Perform the following steps for ESG 2:
  - a. Press **RF On/Off**. The **RF On** annunciator is now displayed.
  - b. Press **CDMA2000 Off On**. **On** is now highlighted and the **I/Q** and **CDMA2K** annunciators are displayed.

---

**NOTE**      If you generate the IS-2000 waveform on ESG 1 before ESG 2, an error message will appear.

---

2. Perform the following steps for ESG 1:
  - a. Press **CDMA2000 Off On**. **On** is now highlighted and the **I/Q** and **CDMA2K** annunciators are displayed.
  - b. Press **I/Q > I/Q Source > Ext I/Q**.  
  
This combines the baseband signals from both ESGs into one. To return to the CDMA2000 menu, press:  
**Mode > Real-time I/Q BaseBand (if it appears) > CDMA > CDMA2000**
  - c. Press **RF On/Off**. The **RF On** annunciator is now displayed.



## Configuring the E4406A VSA for the Two-ESG Forward Link Measurement

This section shows you how to set up the E4406A VSA to display the forward link ESG parameters that were configured in the previous section.

Perform the following steps to show the code domain display in bit reverse:

1. Press **Preset**.
2. Set the VSA to use an external reference and ensure that it is set to 10 MHz.  
Press: **System > Reference > Freq Ref Int Ext**
  - a. Press **10 > MHz**.
  - b. Press the **Freq Ref Int Ext** softkey until **Ext** is underscored.
3. Choose the cdma2000 option.  
Press: **Mode > More (1 of 2) > cdma2000**
4. Set the VSA to receive a base station signal.  
Press: **Mode Setup > Radio > Device BTS MS to BTS**
5. Set the center frequency to 900 MHz.  
Press: **FREQUENCY > 900 > MHz**
6. Set the display span to view the modulated signal.  
Press: **SPAN > 1.8 > MHz**
7. Select the code domain measurement.  
Press: **MEASURE > More (1 of 2) > Code Domain**
8. Set the VSA to display bit reverse.  
Press: **Display > Code Order Bit Reverse**

Bit Reverse changes the view so you will see the number of channel indicators on the display that matches the number of channels that were transmitted. Whereas the Hadamard view can have more channel indicators than the number of channels transmitted.
9. Set the VSA display for a Walsh code length of 128.  
Press: **Display > Base Code Length 64 128 to 128**

This shows all channel indicators in red. With the **Base Code Length 64 128** softkey set to **64**, some channels are shown as yellow.
10. Set the VSA to trigger on a rear external source.  
Press: **Meas Setup > More (1 of 3) > More (2 of 3) > Trig Source > Ext Rear**
11. Press **Restart**.

This allows the VSA to take another single sweep measurement after all settings have been implemented.

12. Position a marker to read a channel.

- a. Press the **Marker** hardkey.
- b. Rotate the front panel knob to position the marker.

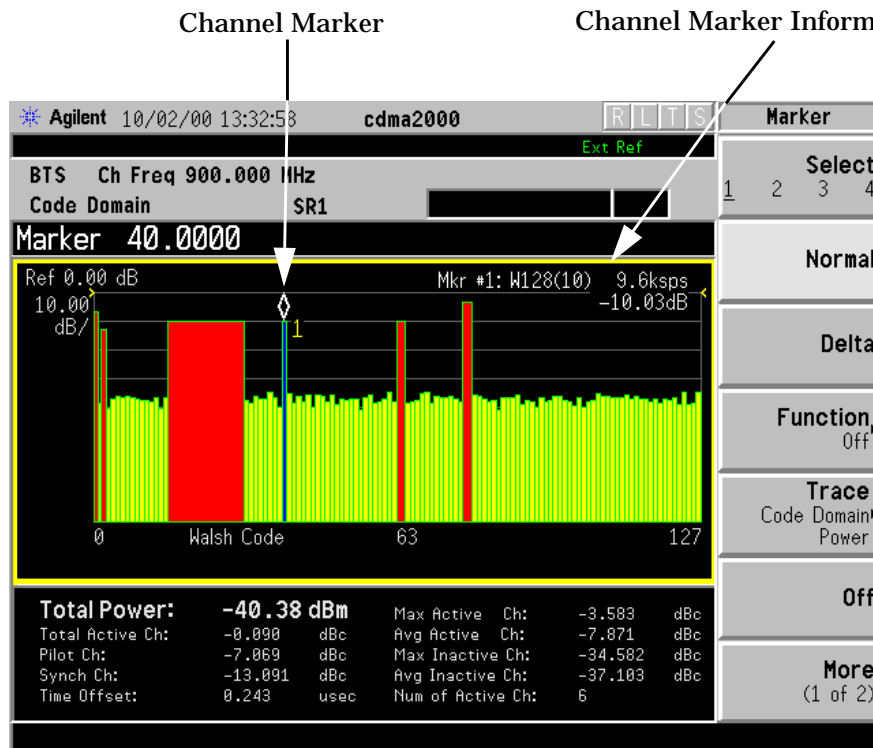
The marker displays a channel's Walsh code spread factor, Walsh code, symbol rate, and power level (indicated as Channel Marker Information on the figure).

13. Set the VSA to measure continuously.

Press: **Meas Control > Measure Single Cont to Cont**

**NOTE** The marker is easier to position when the VSA is set to measure a single sweep.

The following figure shows the VSA code domain display for bit reverse using a forward link, 6-channel, two-ESG configuration.



### Using this Setup with a CDMA Mobile Phone

To connect to a CDMA mobile phone, (because the ESG does not support bidirectional protocol handling) place the mobile phone in a test mode which enables it to process messages without full handshaking.

## Setting Up Quick Paging

Set up Quick paging on ESG 1 or ESG 2 in the two-ESG configuration. If the QPCH is set up on ESG 1, it is necessary to configure it so traffic channels from ESG 2 are not being transmitted at the same time.

---

**NOTE** Quick paging is generated using both channel 3 and 4. If channel 3 is active when you turn on QPCH, channel 3 will turn off. Conversely, if QPCH is on when you activate channel 3, QPCH will turn off.

---

Perform the following steps to set up the quick paging channel for ESG 1 or ESG 2:

1. If ESG 2 is being used as the QPCH source, proceed to step 3.
2. Press **I/Q** > **I/Q Source** > **Int I/Q** on ESG 1.

This prevents the active traffic channels on ESG 2 from being integrated with the ESG 1 signal.

3. Press **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **4** > **Enter** > **Channel Type** > **QPCH**.
4. Press the **Channel Setup** softkey to open the setup editor.

The following figure shows the quick paging channel data fields.

	1	2	3	4
F-PICH	0	32	10	80
F-SYNCH	N/A	N/A	N/A	N/A
F-FCH				
QPCH				

Forward SR1, QPCH.

Power:	0.00 dB	Data Rate:	4.80000 kbps
Walsh:	80	Config Change:	3
		Paging Indicator:	0

The following list describes the fields shown in the figure above. For more information on these fields, refer to Chapter 3 , “[Softkey Reference.](#)”

- |           |  |
|-----------|--|
| Power     | Shows the current power setting.<br>Range: -40.0 dB through 0.0 dB                       |
| Walsh     | Shows the current Walsh code value.<br>Range: 0 through 127<br>Default: 80               |
| Data Rate | Shows the current data rate in kbps.<br>Range: 2.4 kbps or 4.8 kbps<br>Default: 4.8 kbps |

- Config Change** Shows the current value of the configuration change indicator.  
 Range:  
 0 = none  
 1 = first  
 2 = second  
 3 = both  
 Default: 3
- Paging Indicator** Shows the current paging slot.  
 Range:  
 2.4 kbps - 0 through 190, 191 turns all slots on, -1 all slots off  
 4.8 kbps - 0 through 382, 383 turns all slots on, -1 all slots off  
 Default: 0

**NOTE** Notice that the number of available paging slots is dependent on the data rate. The higher data rate allows for more slots.

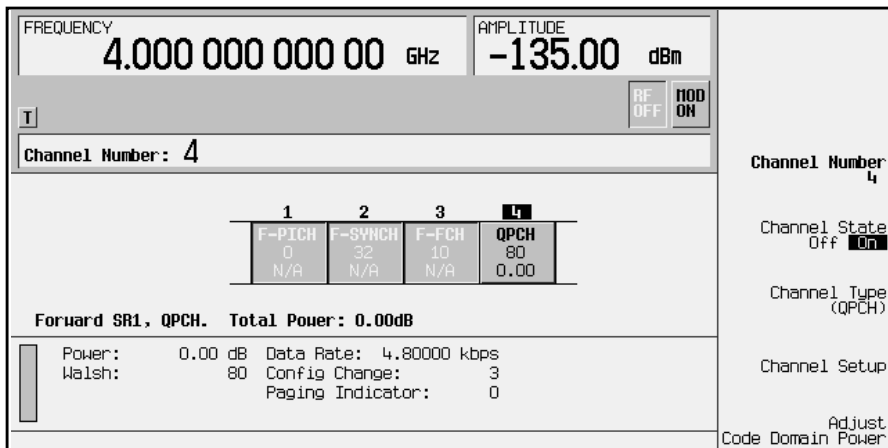
Paging slots can be selected individually by entering a slot number, or all can be selected by entering 191 or 383, depending on the data rate currently showing in the **Data Rate** field. Entering -1 will turn all slots off when all slots have been selected.

- Rotate the front panel knob or use the arrow keys to highlight the **Paging Indicator** field.
- Enter **383** using the numeric keypad and press **Enter**.

For this example, you will only need to change the **Paging Indicator** field. However, to edit the other channel parameters, use the front panel arrow keys to navigate among the data fields. Highlight the desired data field and press **Edit Item**. Edit the data value and press **Enter**.

**NOTE** Selecting less than all paging slots (191 or 383) will not allow you to see the QPCH on the E4406A VSA code domain display. To view individual slots, it is recommended that a time-domain display be used.

- Press **Return** > **Channel State** to **On** to activate the QPCH channel.



## Forward Link Frame Error Rate (FER), Block Error Rate (BLER), and Bit Error Rate (BER) Tests

This section describes real-time FER and BLER tests that can be made using the forward link feature of Option 201. These measurements characterize the performance of an RF receiver under various interference conditions to ensure adequate operation in real-life environments.

FER provides a ratio of the number of frames received with CRC errors to those without errors. The FER tests specified for IS-95 and IS-2000 RF testing include the following:

- “[Sensitivity and Dynamic Range](#)” on page 2-24
- “[Adjacent Channel Interference](#)” on page 2-24
- “[Fading and Multi-Path Distortions](#)” on page 2-24
- “[Single Tone Desensitization](#)” on page 2-24
- “[Intermodulation Spurious Response Attenuation](#)” on page 2-24

---

**NOTE**        The ESG does not contain the decoding capability necessary to perform the FER/BLER tests without externally connected, customer-supplied equipment. See the figure under “[FER Test Setup](#)” for an example of the external equipment needed to perform an automated test.

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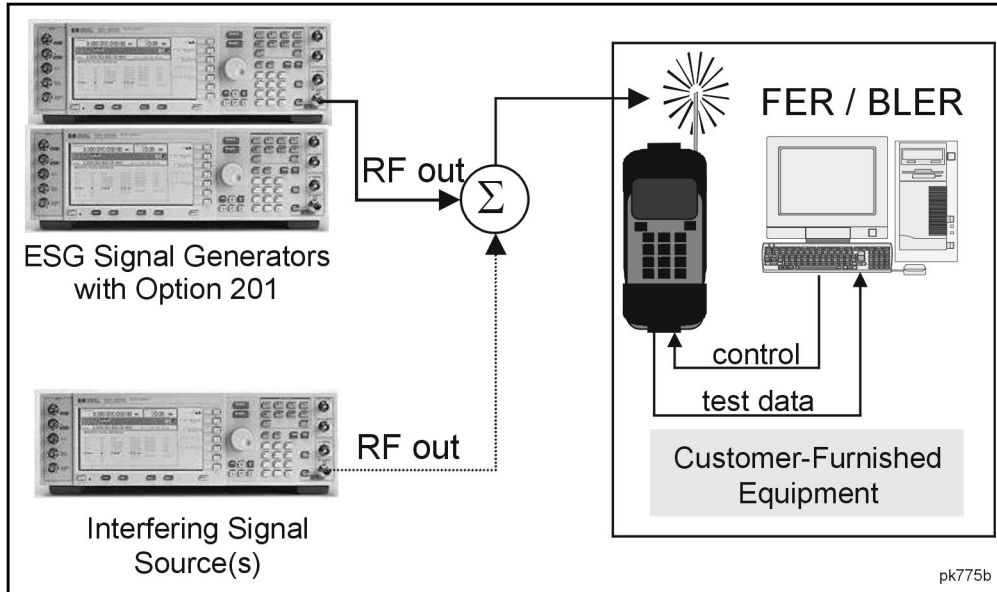
Similarly, BLER tests use a phone or external test equipment to maintain an account of erased blocks. FER and BLER tests are widely used, and help in design characterization, verification, and RF functional testing in manufacturing.

You can also use bit error rate measurements for design characterization, and to provide additional bit error information (see “[Bit Error Rate \(BER\) Tests](#)” on page 2-25).

### FER Test Setup

1. Set up the equipment, using the figure below as a guide. This figure illustrates a generic FER/BLER measurement setup. Equipment varies among tests, and can include one or more interference sources and/or fading equipment.

For automated channel set up and instrument configuration, you can use a computer controlled system.



2. After you set up the equipment, configure the ESGs as described in “[Two-ESG Forward Link Configuration](#)” on page 2-8.

The signal generated by the ESG appears as a base station signal to the mobile phone. The phone synchronizes to the signal and reads the overhead channels. This process comprises the following steps:

- a. ESG Pilot acquired
  - b. Sync channel acquired and decoded
  - c. Paging channel acquired and monitored
3. Place the phone in test mode.

---

**NOTE** The mobile device *must* have a test mode that enables it to deviate from the normal handshaking requirements and go into a manual control mode so that it can be controlled by a computer.

---

4. Issue test mode commands.

Instruct the mobile receiver, via test mode, to listen for a specific RC traffic channel on a specific Walsh code (for example, RC2, F-FCH, Walsh Code 47). The mobile set begins decoding the specified traffic channel.

5. Request the mobile to report the number of frames in error.

Once you have established this general measurement procedure, you can perform the various FER tests.

### **Sensitivity and Dynamic Range**

The sensitivity measurement provides the minimum power level at the receiver that results in a FER, which does not exceed a specified value.

For example, the test could determine the power level required to achieve less than 0.5% FER. Sensitivity helps to characterize a receiver's ability to demodulate a low-level signal, and is a key measure of merit in receiver design; the higher a receiver's sensitivity, the more accurately it receives signals, and the less power it requires from the base station.

Similarly, the receiver's dynamic range is the input power range over which the FER does not exceed a specific value.

### **Adjacent Channel Interference**

This test measures the sensitivity of a receiver in the presence of an adjacent channel signal.

### **Fading and Multi-Path Distortions**

This test uses a channel simulator to apply fading and multi-path distortions to the signal source and measure the sensitivity of the receiver under varying distortion conditions.

### **Single Tone Desensitization**

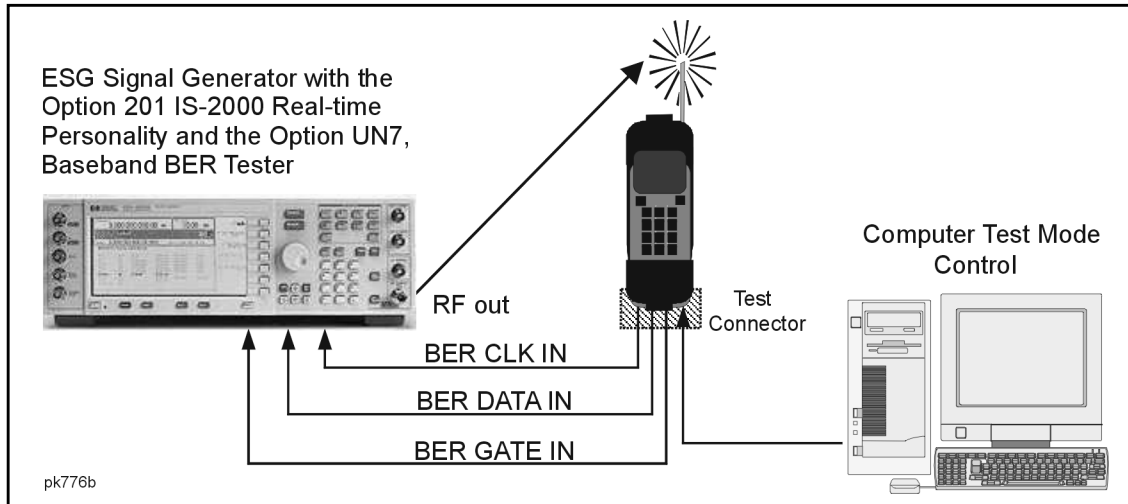
This test measures the ability of the receiver to receive a signal in the presence of a single tone at a given frequency offset away from its center frequency. FER provides the measure of merit.

### **Intermodulation Spurious Response Attenuation**

This test measures a receiver's ability to receive a signal in the presence of two interfering CW tones that produce intermodulation products in the band of the desired CDMA signal. FER provides the measure of merit.

### Bit Error Rate (BER) Tests

You can perform bit error rate testing if the phone can provide layer 1 baseband decoding, and the ESG has both Option 201 and Option UN7 (see the following figure).



In this method, the ESG provides pseudorandom data (PN9 or PN15) that the BER tester can recognize. The phone decodes the data and outputs the deframed data via a test connector, which is fed back to the ESG for BER measurements.

---

**NOTE** This BER test is not using I/Q data, but instead is using a TTL bit stream. Option UN7 operates only on bits and not I/Q signals.

---

### Functional Testing of Algorithm Decoding

This section describes real-time functionality tests that can be performed to verify the operation of the mobile receiver and its supporting firmware. These tests include the following:

- “[Unidirectional Messaging and Protocol Development](#)” on page 2-26
- “[Unidirectional Paging Channel Protocol Development](#)” on page 2-26
- “[Flexible Diagnostic Tests for Firmware](#)” on page 2-26
- “[Functional Tests on Single and Multiple Channels](#)” on page 2-26
- “[Response to Power Control Data](#)” on page 2-26

### Measurement Setup

An example of a measurement setup is shown on [page 2-27](#). Test configurations vary, but usually include the following:

- an ESG Option 201
- a mobile receiver
- control and/or measurement equipment
- interconnections



## Unidirectional Messaging and Protocol Development

Unidirectional means the one-way transmission from the signal generator to a mobile phone receiver. To verify messaging and protocol, transmit user-defined data to the mobile receiver and analyze how the firmware and hardware respond to the data.

This design activity helps identify firmware or hardware problems.

## Unidirectional Paging Channel Protocol Development

This is a subset of messaging and protocol development. Option 201 enables you to insert asynchronous paging messages into the paging channel. This enables the ESG to communicate with a mobile receiver in essentially the same way as a base station, which simplifies the development and verification of paging commands.

## Flexible Diagnostic Tests for Firmware

You can test various portions of firmware, such as testing the following:

- all Walsh code and long code combinations
- all data rates
- convolutional and turbo coding
- any other parameter available

This is useful in regression testing.

## Functional Tests on Single and Multiple Channels

You can perform functional call setup tests to ensure that decoding algorithms in the DSP are working properly. The test uses the various pilot, sync, and paging channels, and confirms that the mobile receiver can properly establish communication.

You can start by setting up a single channel, and systematically progress to a complete multi-channel call to verify receiver operation.

Trying one channel at a time helps to isolate design issues. You can also add an external fading simulator to verify operation in the midst of fading.

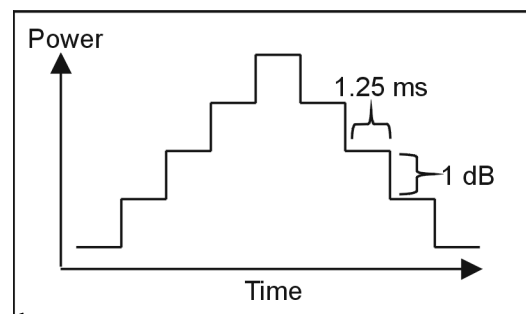
## Response to Power Control Data

At all data rates, power control bits are transmitted at the same power level as data bits.

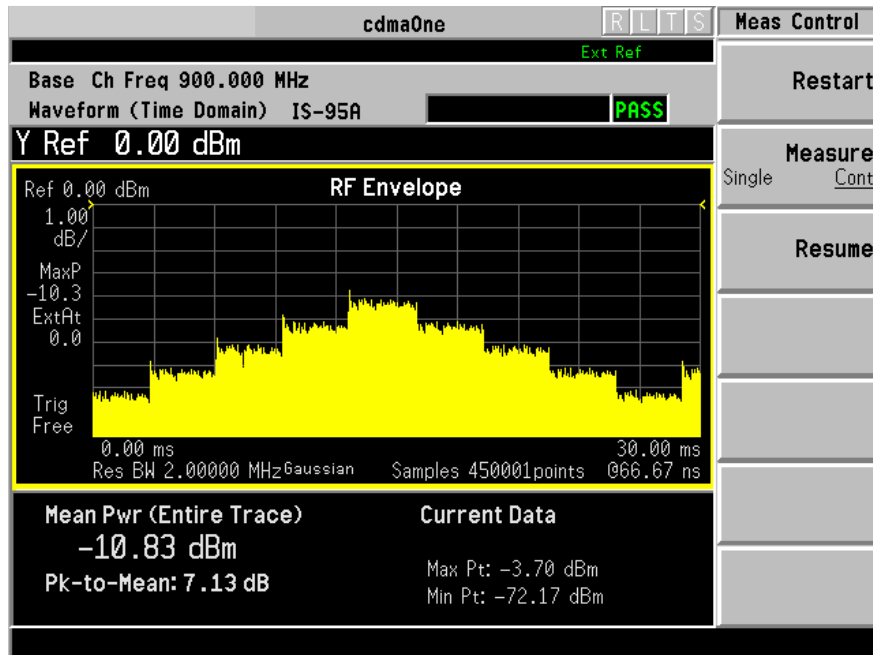
When you use a user-defined power control sequence, power puncturing occurs to cause the mobile phone's power level to step up a specified amount, and then drop back down as shown in the example to the right.

You can define the number of steps. In this example, power puncturing is set to 4 Up/Dn.

This enables you to monitor the power and response of a mobile phone's power control system.

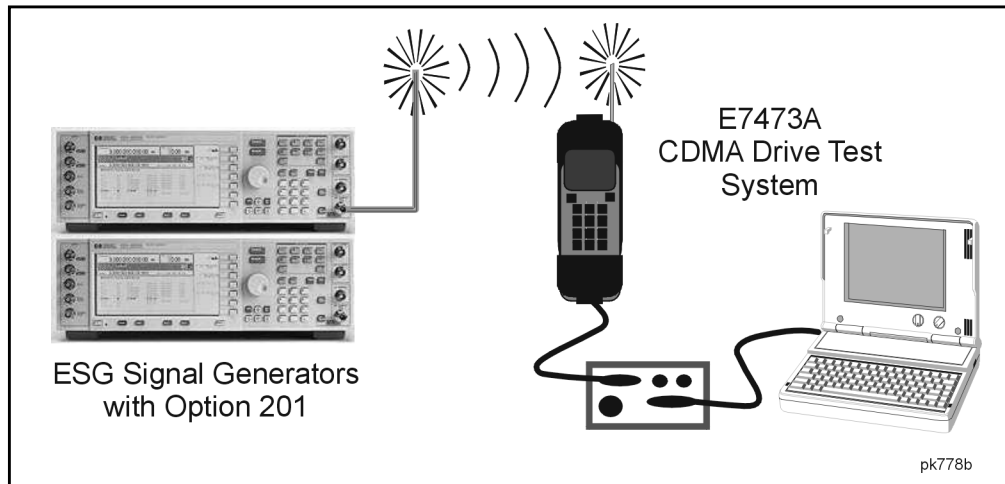


The following figure shows another example of a mobile phone's power response.



### Functional Test Example

The following figure illustrates a functional test setup using an Agilent Technologies E7473A CDMA drive test system. For details about the drive test system, contact your local Agilent Technologies sales and service office.



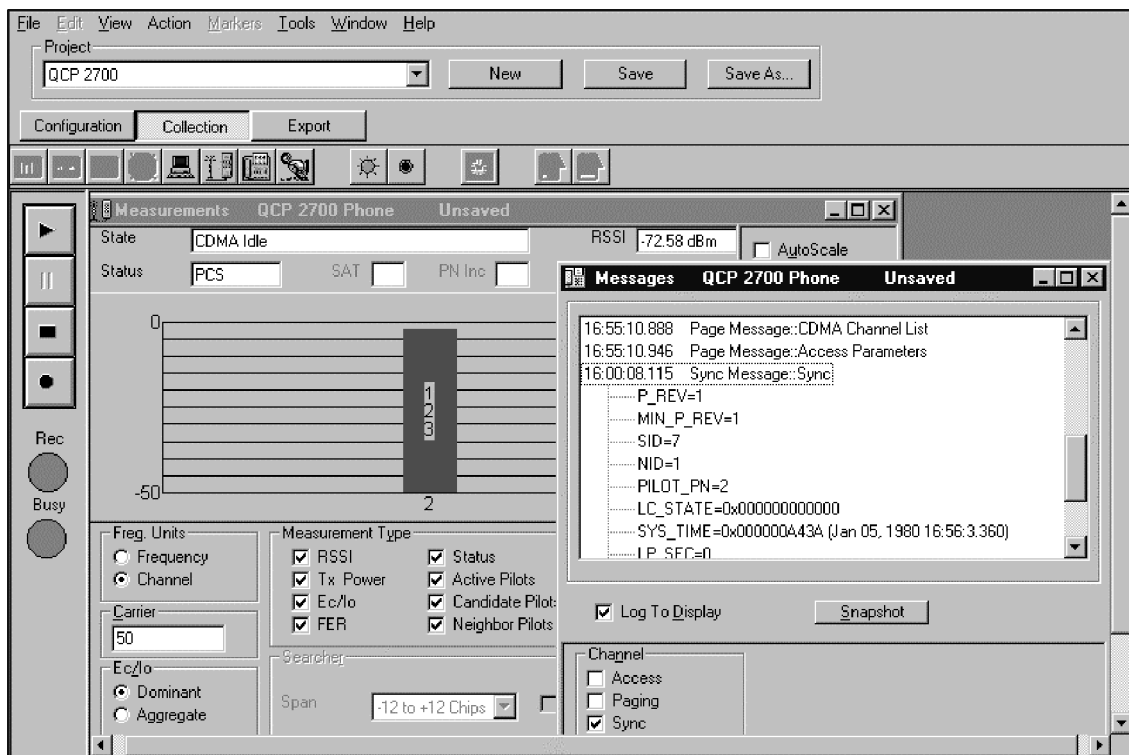
The drive system enables you to monitor the signals generated by the ESG, and observe details such as pilot channel power, sync messages, and paging messages.

## Making a Functional Test Measurement with the Drive Test System

1. Configure the mobile phone as follows:  
Connect it to the system and define the hardware project, the phone, and the port.
2. Configure the ESG as follows:
  - set the frequency to that of the mobile phone
  - set the amplitude to the appropriate level
  - configure the pilot channel
  - configure the sync channel and appropriate sync type
  - configure the paging channel
  - optionally, configure fundamental traffic channel(s)
  - modify any other parameters as needed (such as PN offset)
3. Turn on the phone, load the driver test software and select the appropriate project.
4. Click the collection softkey, then click the icons titled phone virtual front panel and messages virtual front panel.
5. Cycle the phone's power. This synchronizes it to the ESG and displays the sync and paging messages (see [Figure 2-3](#) for an example).

The computer display windows show the transmitter's signal strength, as well as the stream of messages received.

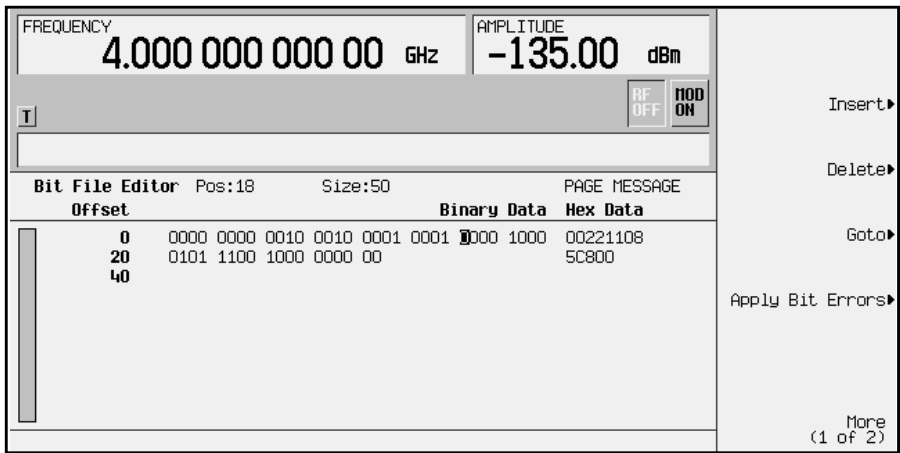
**Figure 2-3. Drive Test System Monitoring Pilot, Sync, & Paging Channels**



**Optional Testing:** You can test a receiver’s ability to track multiple base stations by independently configuring two ESGs as IS-95 or IS-2000 base stations with pilot, sync, traffic, and paging channels. A sync message from the mobile phone indicates that it can keep track of both base stations and select the one with the stronger pilot signal.

### Creating a Synchronous Paging Message

This section shows how to enter and transmit a user-defined paging message. A CDMA base station can be simulated using this feature of the ESG Option 201. (See TIA/EIA-95-B Section 7.1.3.4 for additional information.)



The figure above shows an example of a manually entered page message. The message is a bit representation of the General page message. See “[Understanding the Forward Paging Channel](#)” on page 4-17 for details.

Use the following steps to create a paging message.

1. Press **Mode > CDMA > CDMA2000 > Link Control > Channel Number > 4 > Channel Type F-PCH > Channel Setup**.
2. Use the front panel right arrow key to highlight **DEFAULT**.
3. Press **Edit Item > User File > Create File**.
4. Enter the bit pattern using the front panel numeric keys. The **Offset** field in the edit screen shows the file length in hexadecimal. Each row has a value of 20 hexadecimal.
5. Press **More > Rename** and enter a file name. Press **Enter**.
6. Press **Return** to return to the Catalog of Binary/Bit Files. The file appears in the catalog listing.
7. Scroll to the created file to highlight it and press **Select File**. The file name appears in the Channel 4 menu screen **Data** field.
8. Press **Return > Channel State Off On** until **On** is highlighted.
9. Press **Return > CDMA2000 Off On** until **On** is highlighted.
10. Press **RF On/Off** until **RF ON** is displayed. The signal generator will transmit the paging message.

---

## Reverse Link Test Configurations and Measurements

This section will demonstrate how to configure a single-ESG and a two-ESG test configuration. The two configurations will utilize IS-2000 compliant features while using an Agilent Technologies E4406A VSA Transmitter Tester for measurement purposes. (Refer to the E4406A VSA Transmitter Tester User's Guide and cdma2000 Measurement Guide for specific E4406A measurement information.)

### Single-ESG Reverse Link Configuration

This section will guide you through configuring the ESG for IS-2000 using 4 channels with RC3. You will be shown how to step through the Option 201 reverse link menus, set Walsh codes, data rates, and data types.

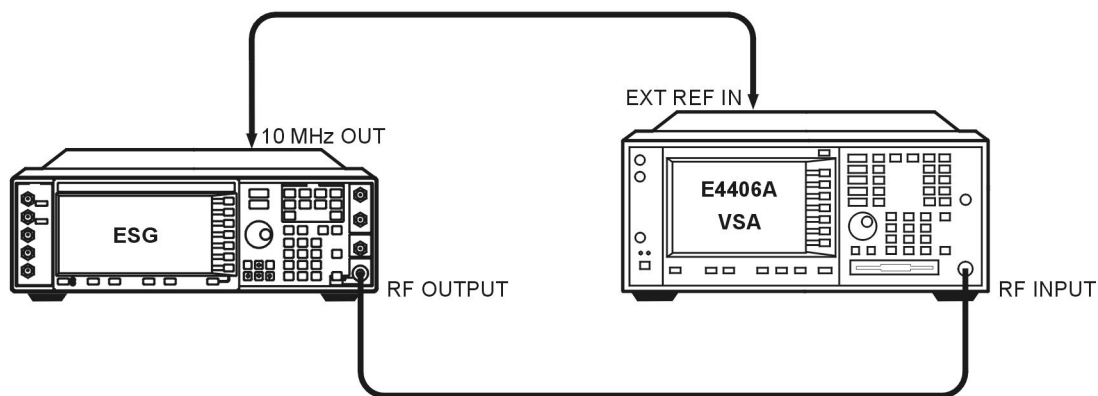
#### Required Equipment

- 1 Agilent Technologies ESG-D or ESG-DP Family Signal Generator with Options UN8 and 201
- 1 Agilent Technologies E4406A VSA Series Transmitter Tester with Option B78
- 2 BNC Cables
- 2 Type-N (m) to BNC (f) adapters

#### Measurement Setup

1. Refer to Figure 2-4. and connect the ESG to the E4406A.

**Figure 2-4. Single-ESG Reverse Link Measurement Setup**



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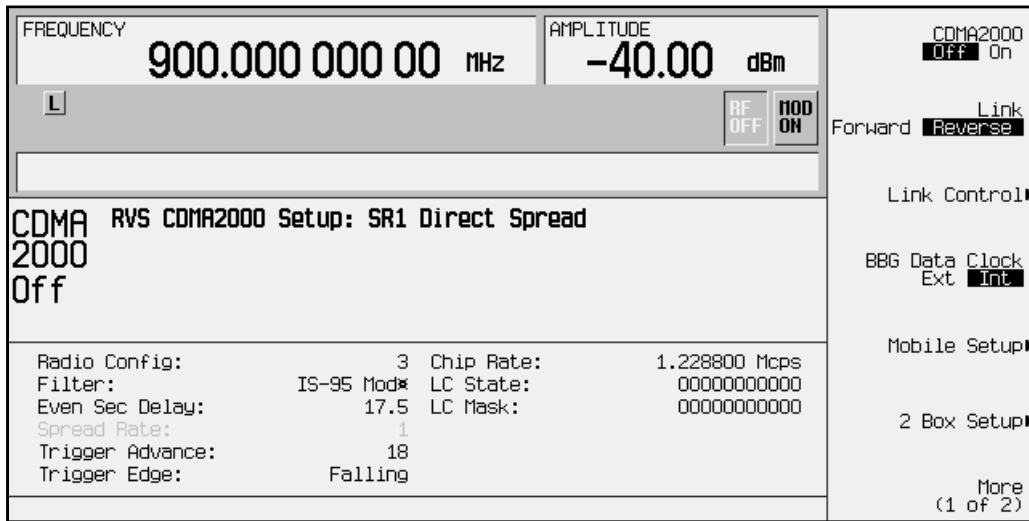
2. Turn on the ESG and the E4406A VSA transmitter tester.

### Configuring the Single-ESG for Reverse Link

**NOTE** The following signal generator settings are used for example purposes. Change them as needed for your device under test (DUT).

1. Press **Preset** (factory defined, not user defined).
2. Press **Frequency > 900 > MHz** and then press **Amplitude > -40 > dBm**.
3. Press **Mode > Real Time I/Q BaseBand** (if it appears) > **CDMA > CDMA2000 > Link Forward Reverse to Reverse**.
4. Check that **Int** is highlighted on the **BBG Data Clock Ext Int** softkey.
5. Press **More (1 of 2)**.
6. Check that **Normal** is highlighted on the **Phase Polarity Normal Invert** softkey.
7. Press **More (2 of 2)**.

The following figure shows the default values for the reverse link data fields (which are used for this example). If you need to change these fields, press the **Mobile Setup** softkey, rotate the front panel knob, or press the arrows keys to move the highlight bar to the desired field and then press **Edit Item**. Press **Return** to revisit the CDMA2000 menu.



The following are brief descriptions of the available fields. Refer to Chapter 3 , “Softkey Reference,” for more detailed information on each field.

**NOTE** If a field is grayed out, it cannot be edited.

Radio Config	This displays the current radio configuration (RC). RC1–4 can be entered with RC1 and RC2 being IS–95 compatible.
--------------	---

Filter	This displays the current filter being used. In addition to the standard filters (Root Nyquist, Nyquist, Gaussian and User FIR), there are two IS-95 filters that can be used with RC3 and RC4, IS-95 and IS-95 Mod.
Even Sec Delay	This displays the delay of data transmission relative to the internal data clock. This is measured in units of chips with a 0.5 chip resolution.
Spread Rate	This displays the spread rate being used.
Trigger Advance	This displays the offset in chips that is being used to align the RF output with the base station timing signal relative to the ESG internal even second clock. This is used to synchronize the ESG with the base station.
Trigger Edge	This sets the ESG to trigger on the rising or falling edge of the base station timing signal.
Chip Rate	This displays the number of chips being spread and the amount of bandwidth being occupied.
LC State	This displays the value of the long code that is available in the shift register. Setting a value other than 0 seeds the long code. For no long code, set to 0000000000.
LC Mask	This displays the current value for the mask. It is a 42-bit binary number that creates the unique identity of the long code and determines which values in the LC State are processed.

#### 8. Press Link Control.

This accesses a channel control menu where the channels can be turned on or off, the channel type selected and parameters edited, and the code domain power adjusted.

#### 9. Press the following key sequences to configure the individual channels, starting with channel one. The channel parameters are shown in Table 2-4.

---

**NOTE** The **Channel Number** softkey is always bold. This indicates that you do not have to press this softkey to change channel numbers. You can change channels by pressing the appropriate number and the **Enter** softkey, rotating the front panel knob, or using the arrow keys.

---

- **1 > Enter > Channel State Off On to On > Channel Setup > Power > -7 > dB > Return**
- **2 > Enter > Channel State Off On to On > Channel Setup > Power > -13 > dB > Walsh > 10 > Enter > Data > Edit Item > PN Sequence > PN15 > Return**
- **3 > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Walsh > 14 > Enter > Return**
- **4 > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Walsh > 2 > Enter > Data > Edit Item > PN Sequence > PN15 > Data Rate > 19.2 > kbps > Return**

**Table 2-4. Reverse Link Single-ESG Channel Parameters for RC3**

Channel Number	Channel Type	Channel State	Channel Power	Walsh Code	Data	Data Rate
1	R-PICH	On	-7.0 dB	0	N/A	N/A
2	R-DCCH	On	-13.0 dB	10	PN15	9.60000 kbps
3	R-FCH	On	-10.0 dB	14	PN9	9.60000 kbps
4	R-SCH	On	-10.0 dB	2	PN15	19.2000 kbps

---

**NOTE** When setting the R-SCH Walsh code or data rate, ensure that the combination of the two is in accordance with IS-2000 specifications. Refer to [“Reverse Link R-SCH Walsh Codes and Data Rates”](#) on page 4-19 for more information.

---

10. Press **Adjust Code Domain Power > Scale To 0dB**.

Notice that the power levels have changed on each channel. This has scaled the channel power levels to the proper amplitudes for transmission (the sum log value of the new power levels equal zero). The power *ratios* between the channels remain unchanged.

---

**NOTE** Adjusting the code domain power will work on active channels only.

---

11. Press **Return**. The CDMA2000 menu is now displayed.

12. Press **CDMA2000 Off On**. **On** is now highlighted and the CDMA2K and I/Q annunciators are showing.

13. Check that the MOD ON annunciator is displayed on the ESG and press **RF On/Off**. The RF ON annunciator is now displayed.



## Configuring the E4406A VSA for a Single-ESG Reverse Link Measurement

This section shows you how to set up the E4406A VSA to display the reverse link ESG parameters that were configured in the previous section.

Perform the following steps to show the code domain display in bit reverse:

1. Press **Preset**.
2. Set the VSA to use an external reference and ensure that it is set to 10 MHz.  
Press: **System > Reference > Freq Ref Int Ext**
  - a. Press **10 > MHz**.
  - b. Press the **Freq Ref Int Ext** softkey until **Ext** is underscored.
3. Choose the cdma2000 option.  
Press: **Mode > More (1 of 2) > cdma2000**
4. Set the VSA to receive a mobile signal.  
Press: **Mode Setup > Radio > Device BTS MS to MS**
5. Set the center frequency to 900 MHz.  
Press: **Frequency > 900 > MHz**
6. Set the display span to view the full modulated signal.  
Press: **SPAN > 1.8 > MHz**
7. Select the code domain measurement.  
Press: **Measure > More (1 of 2) > Code Domain**
8. Set the long code mask to zero.  
Press: **Meas Setup > More (1 of 3) > Long Code Mask > 0 > Done**
9. Set the VSA to display bit reverse.  
Press: **Display > Code Order Bit Reverse**

Bit Reverse changes the view so you will see the number of channel indicators on the display that matches the number of channels that were transmitted. Whereas the Hadamard view can have more channel indicators than the number of channels transmitted.
10. Press **Restart**.

This allows the VSA to take another single sweep measurement after all settings have been implemented.

11. Position a marker to read a channel.

- a. Press the **Marker** hardkey.
- b. Starting with zero, count how many spaces to the desired channel from the left side of the display and enter the number (if it is on the Q side, 0.5 needs to be added to the number; for example 8.5, not 8).
- c. Press **Enter** (softkey or front panel key).

The marker displays a channel's Walsh code spread factor, Walsh code, symbol rate, and power level (indicated as Channel Marker Information on the figure).

12. Set the VSA to measure continuously.

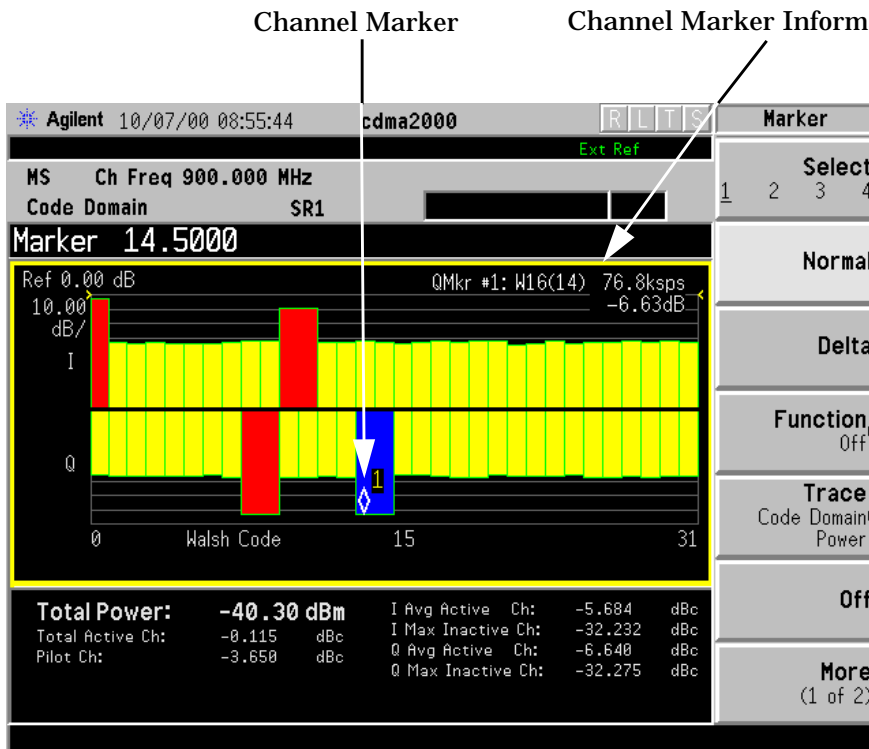
Press: **Meas Control > Measure Single Cont to Cont**

---

**NOTE** The marker is easier to position when the VSA is set to measure a single sweep.

---

The following figure shows the VSA code domain display for bit reverse:



## Two-ESG Reverse Link Configuration

This section will guide you through configuring the two-ESG configuration for IS-2000 using 5 channels. Four channels will be configured on ESG 1 and one additional reverse supplemental channel (R-SCH<sub>1</sub>) on ESG 2. The measurements will be made using the E4406A VSA Transmitter Tester.

### Required Equipment

- 2 Agilent Technologies ESG-D or ESG-DP Family Signal Generators with Options UN8 and 201
- 1 Agilent Technologies E4406A VSA Series Transmitter Tester with Option B78
- 11 BNC Cables (See note prior to setup drawing for length requirements)
- 3 BNC Tee adapters
- 1 BNC coupler
- 3 Type-N (m) to BNC (f) adapters

### System Configuration Process

The two-ESG system configuration process is divided into the following subsections:

- [“Two-ESG Reverse Link Measurement Setup”](#) on page 2-37
- [“Configuring ESG 1 for Reverse Link”](#) on page 2-38
- [“Configuring ESG 2 for Reverse Link”](#) on page 2-40
- [“Adjust the Relative Power Mapping \(Two-ESG Reverse Link\)”](#) on page 2-42
- [“Generate the Signal at the RF Output \(Two-ESG Reverse Link\)”](#) on page 2-44
- [“Configuring the E4406A VSA for a Two-ESG Reverse Link Measurement”](#) on page 2-45

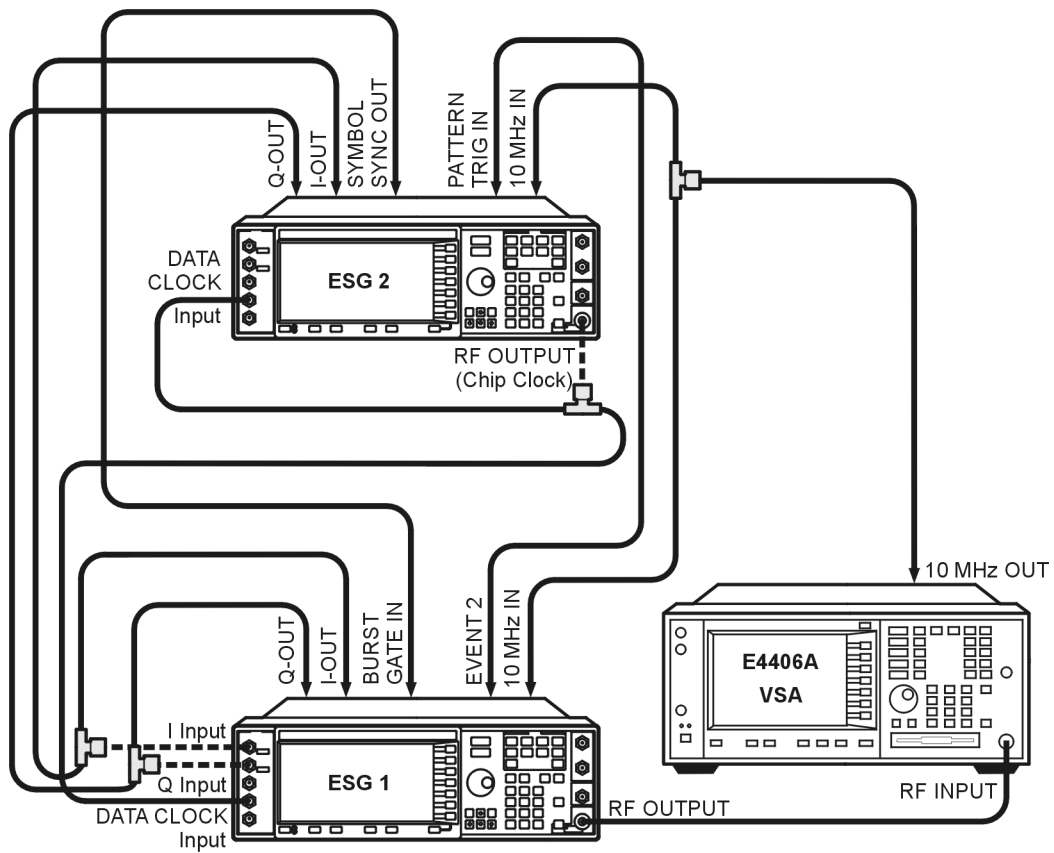
### Two-ESG Reverse Link Measurement Setup

1. Refer to Figure 2-5. and connect the two ESGs and the E4406A VSA.

**NOTE** The following connections require short cables of equal length to reduce phase difference:

Data Clock ESG 1 and ESG 2 Input to RF Output on ESG 2  
I Out and Q Out ESG 2 to I Input and Q Input on ESG 1  
I Out and Q Out ESG 1 to I Input and Q Input on ESG 1

**Figure 2-5. Two-ESG Reverse Link Measurement Setup**



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2. Turn on the ESGs and the E4406A VSA.

## Configuring ESG 1 for Reverse Link

**NOTE** The following signal generator settings are used for example purposes. Change them as needed for your device under test (DUT).

1. Press **Preset** (factory defined not user defined).
2. Press **Frequency** > **900** > **MHz** and then press **Amplitude** > **-40** > **dBm**.
3. Press **Mode** > **Real-time I/Q BaseBand** (if it appears) > **CDMA** > **CDMA2000** > **Link Forward Reverse** to **Reverse**.
4. Press the **BBG Data Clock Ext Int** softkey. **Ext** is now highlighted.
5. Press **More (1 of 2)**.
6. Check that **Normal** is highlighted on the **Phase Polarity Normal Invert** softkey.
7. Press **More (2 of 2)**.

The following figure displays the default values for the CDMA2000 reverse link mobile setup data fields which are used for ESG 1. If there is a need to change any of the field values, press the **Mobile Setup** softkey, rotate the front panel knob or press the arrow keys to move the highlight bar to the desired field and then press **Edit Item**. Press **Return** to reopen the CDMA200 menu.

FREQUENCY <b>900.000 000 00</b> MHz		AMPLITUDE <b>-40.00</b> dBm		CDMA2000 <b>Off</b> On	
RF OFF		MOD ON		Forward <b>Reverse</b> Link	
CDMA 2000 Off				Link Control▶	
RVS CDMA2000 Setup: SR1 Direct Spread				BBG Data Clock <b>Ext</b> Int	
Radio Config: 3 Chip Rate: 1.228800 Mcps				Mobile Setup▶	
Filter: IS-95 Mod* LC State: 0000000000				2 Box Setup▶	
Even Sec Delay: 17.5 LC Mask: 0000000000					
Spread Rate: 1					
Trigger Advance: 18					
Trigger Edge: Falling				More (1 of 2)	

The following are brief descriptions of the available fields. Refer to Chapter 3 , “Softkey Reference,” for more detailed information on each field.

**NOTE** If a field is grayed out, it cannot be edited.

Radio Config	This displays the current radio configuration (RC). RC1–4 can be entered with RC1 and RC2 being IS–95 compatible.
--------------	---

Filter	This displays the current filter being used. In addition to the standard filters (Root Nyquist, Nyquist, Gaussian and User FIR), there are two IS-95 filters that can be used with RC3 and RC4, IS-95 and IS-95 Mod.
Even Sec Delay	This displays the delay of data transmission relative to the internal data clock. This is measured in units of chips with a 0.5 chip resolution.
Spread Rate	This displays the spread rate being used and cannot be edited.
Trigger Advance	This displays the offset in units of chips that is being used to align the RF output with the base station timing signal relative to the ESG internal even second clock. This is used to synchronize the ESG with the base station.
Trigger Edge	This sets the ESG to trigger on the rising or falling edge of the base station timing signal.
Chip Rate	This displays the number of chips being spread and the amount of bandwidth being occupied.
LC State	This displays the value of the long code that is available in the shift register. Setting a value other than 0 seeds the long code. For no long code, set to 0000000000.
LC Mask	This displays the current value for the mask. It is a 42-bit binary number that creates the unique identity of the long code and determines which values in the LC State are processed.

8. Press Link Control.

This accesses a channel control menu where the channels can be turned on or off, the type selected and edited, and the code domain power adjusted.

9. Press the following key sequences to configure the individual channels starting with channel one. The channel parameters are shown in Table 2-5.

---

**NOTE** The **Channel Number** softkey is always bold. This indicates that you do not have to press this softkey to change channel numbers. You can change channels just by pressing the appropriate number and the **Enter** softkey, rotating the front panel knob, or using the arrow keys.

---

- **1** > Enter > Channel State Off On to On > Channel Setup > Power > -7 > dB > Return
- **2** > Enter > Channel State Off On to On > Channel Setup > Power > -13 > dB > Walsh > **10** > Enter > Data > Edit Item > PN Sequence > **PN15** > Return
- **3** > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Walsh > **7** > Enter > Return
- **4** > Enter > Channel State Off On to On > Channel Setup > Power > -10 > dB > Walsh > **2** > Enter > Data > Edit Item > PN Sequence > **PN15** > Data Rate > **19.2** > kbps > Return

**Table 2-5. Reverse Link ESG 1 Channel Parameters for RC3**

Channel Number	Channel Type	Channel State	Channel Power	Walsh Code	Data	Data Rate
1	R-PICH	On	-7.0 dB	0	N/A	N/A
2	R-DCCH	On	-13.0 dB	10	PN15	9.60000 kbps
3	R-FCH	On	-10.0 dB	7	PN9	9.60000 kbps
4	R-SCH	On	-10.0 dB	2	PN15	19.2000 kbps

---

**NOTE** When setting the R-SCH Walsh code or data rate, ensure that the combination of the two is in accordance with IS-2000 specifications. Refer to “[Reverse Link R-SCH Walsh Codes and Data Rates](#)” on page 4-19 for more information.

---

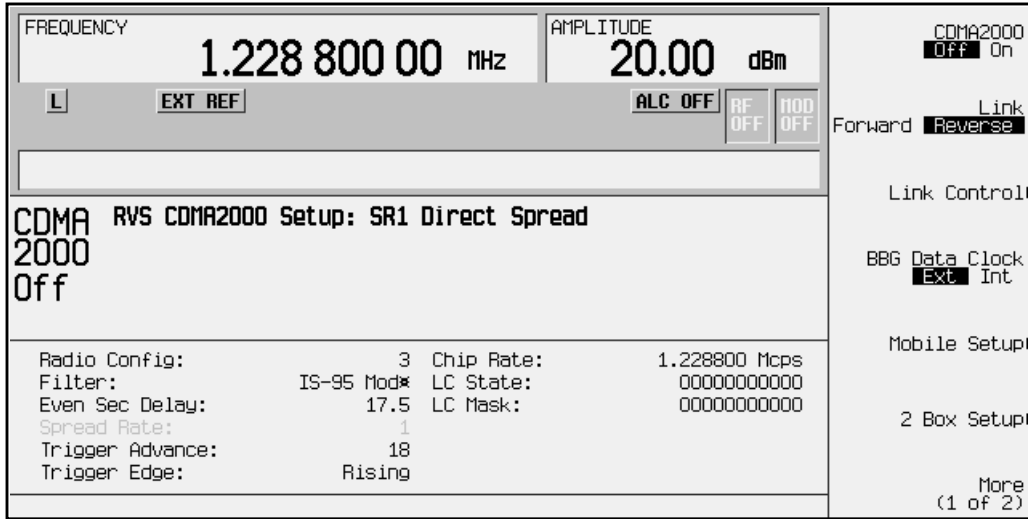
10. Press **Return**. The CDMA2000 top menu is now displayed.

### Configuring ESG 2 for Reverse Link

In addition to sourcing part of the CDMA signal, ESG 2 is used as the data clock for both ESGs.

1. Press **Preset** (factory defined not user defined).
2. Press **Ampl > ALC Off On** to **Off**.  
The automatic leveling control is turned off when two ESGs are used together.
3. Press **Frequency > 1.2288 > MHz** and then press **Amplitude > 20 > dBm**.  
This sets ESG 2 to be used as the chip clock and sets the amplitude to provide near TTL voltages to drive the data clock.
4. Press **Mod On/Off**. The **MOD OFF** annunciator is now displayed.
5. Press **Mode > Real-time I/Q BaseBand** (if it appears) **> CDMA > CDMA2000 > Link Forward Reverse** to **Reverse**.
6. Press the **BBG Data Clock Ext Int** softkey. **Ext** is now highlighted.
7. Press **More (1 of 2)**.
8. Press the **Phase Polarity Normal Invert** softkey. **Invert** is now highlighted.
9. Press **More (2 of 2)**.
10. Press the **Mobile Setup** softkey.
11. Press the appropriate arrow key or rotate the front panel knob to move the highlight bar to the **Trigger Edge** data field.
12. Press **Edit Item > Rising > Return**.

The following figure displays the current mobile setup field values that will be used for ESG 2 in this example.



Notice that Rising is now displayed in the Trigger Edge data field.

13. Press **Link Control**.

14. Press the following key sequences to configure channel 2. The channel parameters are shown in Table 2-6.

- 2 > Enter > Channel Type R-DCCH R-SCH to R-SCH > Channel State Off On to On > Channel Setup > Power > -9 > dB > Walsh > 6 > Enter > Data Rate > 38.4 > kbps > Data > Edit Item > PN Sequence > PN15 > Return

**Table 2-6. Reverse Link ESG 2 Channel Parameters for RC3**

Channel Number	Channel Type	Channel State	Channel Power	Walsh Code	Data	Data Rate
2	R-SCH	On	-9.0 dB	6	PN15	38.4000 kbps

15. Press **Return**. The CDMA2000 top menu is now displayed.



### Adjust the Relative Power Mapping (Two-ESG Reverse Link)

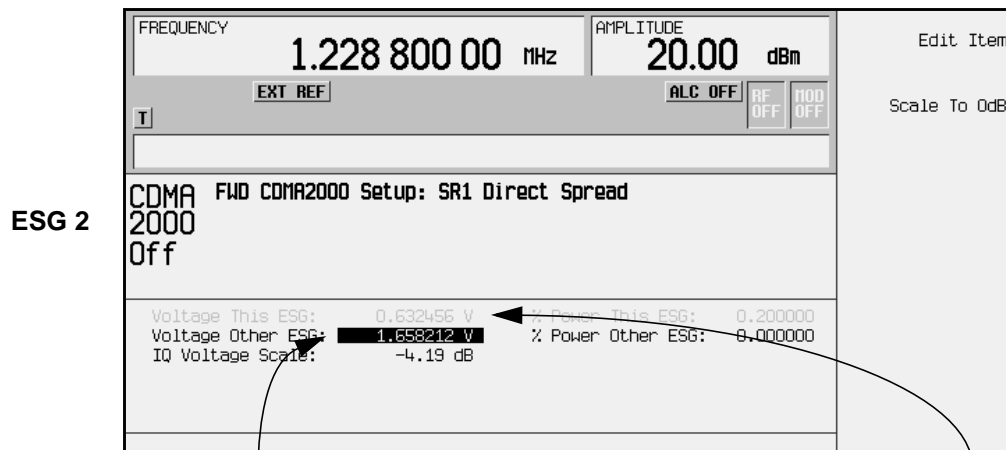
Once the signal generators are configured as described in the previous sections, use the following steps to perform the relative power mapping procedure. Relative power mapping assures proper channel power levels between the two ESGs and an overall code domain power of 0 dB. For more information, see “[Forward and Reverse Link Relative Power Mapping](#),” on page 4 -16.

1. Return to the CDMA2000 menu and press **2 Box Setup** on both ESGs.
2. Refer to the following figures. Highlight the Voltage Other ESG data field on ESG 1 and enter the Voltage This ESG value from ESG 2. Press **V** to terminate the entry.

The individual ESG voltage adjustments are made to align the channel voltages between the signal generators. This in turn adjusts the I/Q voltage scale. While this scales the channels relative to each other, it does not ensure the 0 dBm power level required for the code domain. This will be done later in the process.

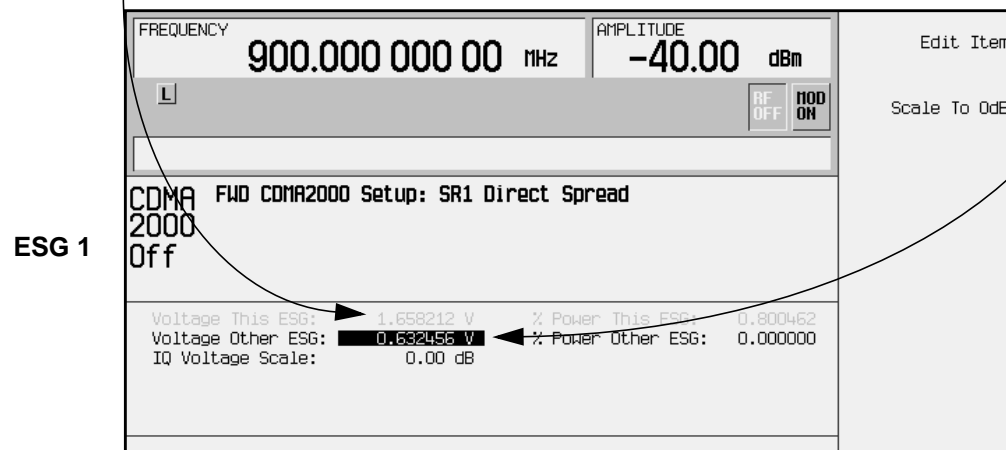
3. Highlight the Voltage Other ESG data field on ESG 2 and enter the Voltage This ESG value from ESG 1. Press **V** to terminate the entry.

Notice that the IQ Voltage Scale value has changed on ESG 2.



a. Enter this value here.

b. Enter this value here.



4. Refer to the following figures. Highlight the % Power Other ESG data field on ESG 1 and enter the % Power This ESG value from ESG 2. Press **Enter** to terminate the entry.

The percent power adjustment sets the parameters that will allow the scale to 0 dB function to scale all channels to 0 dB. This aligns the displayed power of both ESGs to match the code domain measurement values on the transmitter tester.

5. Highlight the % Power Other ESG: data field on ESG 2 and enter the % Power This ESG value from ESG 1. Press **Enter** to terminate the entry.

**ESG 2**

FREQUENCY	1.228 800 00 MHz	AMPLITUDE	20.00 dBm	Edit Item Scale To 0dB
EXT REF		ALC OFF	RF OFF MOD OFF	
CDMA FWD CDMA2000 Setup: SR1 Direct Spread				
CDMA 2000 Off				
Voltage This ESG:	0.632456 V	% Power This ESG:	0.200000	
Voltage Other ESG:	1.658212 V	% Power Other ESG:	0.800462	
IQ Voltage Scale:	-4.19 dB			

a. Enter this value here.

b. Enter this value here.

**ESG 1**

FREQUENCY	900.000 000 00 MHz	AMPLITUDE	-40.00 dBm	Edit Item Scale To 0dB
T		RF OFF	MOD ON	
CDMA FWD CDMA2000 Setup: SR1 Direct Spread				
CDMA 2000 Off				
Voltage This ESG:	1.658212 V	% Power This ESG:	0.800462	
Voltage Other ESG:	0.632456 V	% Power Other ESG:	0.200000	
IQ Voltage Scale:	0.00 dB			

6. Press **Scale to 0dB** on both ESGs.

The voltage and power values may change to reflect the adjusted power levels.

---

**NOTE** Pressing **Scale To 0dB** on both ESGs scales the individual channel power levels so that the *sum of the code domain power generated by both ESGs* equals 0 dB. This does not change the total power, as set by the **Amplitude** key.

---

7. Press **Return** on both ESGs to open the CDMA2000 menu.

## Generate the Signal at the RF Output (Two-ESG Reverse Link)

This section describes the proper order that must be used to turn on the RF output and the Option 201 (cdma2000 personality). If for any reason the signal from ESG 2 is interrupted, whether by turning off the RF output, cdma2000 personality or ESG power, then the following process must be repeated.

1. Perform the following steps for ESG 2:
  - a. Press **RF On/Off**. The RF On annunciator is now displayed.
  - b. Press **CDMA2000 Off On**. On is now highlighted and the I/Q and CDMA2K annunciators are displayed.

---

**NOTE** If you generate the IS-2000 waveform on ESG 1 before ESG 2, an error message will appear.

---

2. Perform the following steps for ESG 1:
  - a. Press **CDMA2000 Off On**. On is now highlighted and the I/Q and CDMA2K annunciators are displayed.
  - b. Press **I/Q > I/Q Source > Ext I/Q**  
  
This combines the baseband signals from both ESGs into one. To return to the CDMA2000 menu, press **Mode > Real-time I/Q BaseBand** (if it appears) **> CDMA > CDMA2000**.
  - c. Press **RF On/Off**. The RF On annunciator is now displayed.

## Configuring the E4406A VSA for a Two-ESG Reverse Link Measurement

This section shows you how to set up the E4406A VSA to display the reverse link ESG parameters that were configured in the previous section.

Perform the following steps to show the code domain display in bit reverse:

1. Press **Preset**.
2. Select the internal VSA frequency reference and ensure that it is set to 10 MHz.  
Press: **System > Reference > Freq Ref Int Ext**
  - a. Press **10 > MHz**.
  - b. Press the **Freq Ref Int Ext** softkey until **Int** is underscored.
  - c. Ensure that **On** is underscored on the **10 MHz Out On Off** softkey. If **Off** is underscored, press the **10 MHz Out On Off** softkey until **On** is underscored.
3. Choose the cdma2000 option.  
Press: **Mode > More (1 of 2) > cdma2000**
4. Set the VSA to receive a mobile signal.  
Press: **Mode Setup > Radio > Device BTS MS to MS**
5. Set the center frequency to 900 MHz.  
Press: **Frequency > 900 > MHz**
6. Set the display span to view the full modulated signal.  
Press: **SPAN > 1.8 > MHz**
7. Select the code domain measurement.  
Press: **Measure > More (1 of 2) > Code Domain**
8. Set the long code mask to zero.  
Press: **Meas Setup > More (1 of 3) > Long Code Mask > 0 > Done**
9. Set the VSA to display bit reverse.  
Press: **Display > Code Order Bit Reverse**

Bit Reverse changes the view so you will see the number of channel indicators on the display that matches the number of channels that were transmitted. Whereas the Hadamard view can have more channel indicators than the number of channels transmitted.
10. Press **Restart**.

This allows the VSA to take another single sweep measurement after all settings have been implemented.

11. Position a marker to read a channel.

- a. Press the **Marker** hardkey.
- b. Starting with zero, count how many spaces to the desired channel from the left side of the display and enter the number (if its on the Q side, 0.5 needs to be added to the number; for example 8.5, not 8).
- c. Press the **Enter** softkey or front panel key.

The marker displays a channel's Walsh code spread factor, Walsh code, symbol rate, and power level (indicated as Channel Marker Information on the figure).

12. Set the VSA to measure continuously.

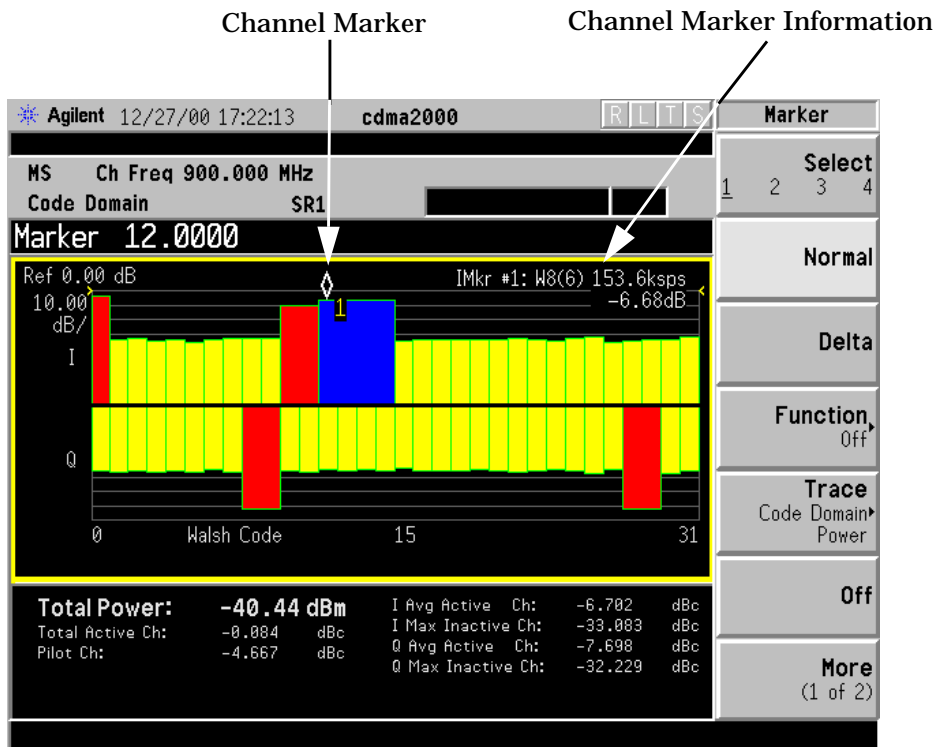
Press: **Meas Control > Measure Single Cont to Cont**

---

**NOTE** The marker is easier to position when the VSA is set to measure a single sweep.

---

The following figure shows the VSA code domain display for bit reverse using a reverse link, 5-channel, two-ESG configuration.



## Reverse Link Bit Error Rate (BER) and Frame Error Rate (FER) Tests

This section will demonstrate a generic test setup which applies to both IS-95 and IS-2000 applications. The setup can be used to perform the following tests:

- Bit Error Rate (BER)

BER is the ratio of the number of bit errors to the total number of bits sent in a given time interval. The BER test allows you to check the BTS ability to properly receive and demodulate a signal.

This is accomplished by comparing the MS bit sequence output with a known reference bit sequence.

- Frame Error Rate (FER)

FER provides a ratio of the number of frames received with CRC errors to those without errors.

---

**NOTE**        The ability to perform these tests properly is based upon the operator using known data that is common to both the ESG and the customer-supplied device. The customer-supplied device is used as the comparator.

---

The following measurements can be performed in conjunction with the BER or FER tests.

- Sensitivity and Dynamic Range

The sensitivity measurement provides the minimum power level at the BTS that results in a FER and does not exceed a specified value.

For example, the test could determine the power level required to achieve less than 0.5% FER. Sensitivity helps to characterize the ability of the BTS to demodulate a low-level signal, and is a key measure of merit in receiver design; the higher the sensitivity of the BTS, the more accurately it receives signals, and the less power it requires from the base station.

Similarly, the dynamic range of the BTS is the input power range over which the FER does not exceed a specific value.

- Intermodulation

This test measures the ability of the BTS to receive a signal in the presence of two interfering CW tones that produce intermodulation products in the band of the desired CDMA signal. FER provides the measure of merit.

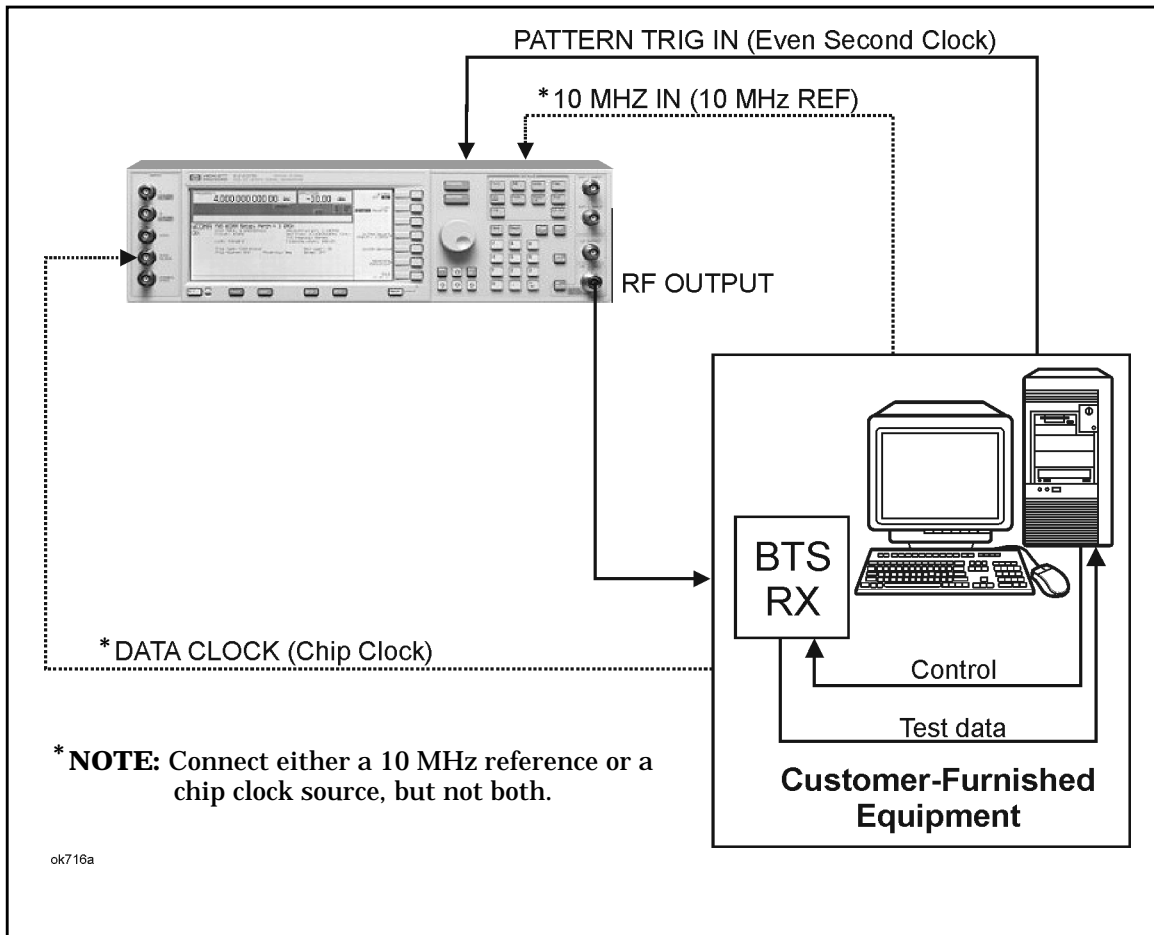
- Adjacent Channel Selectivity

This test measures the sensitivity of the BTS in the presence of an adjacent channel signal.

## Reverse Link Test Setup

The following test setup can be performed using either the single- or the two-ESG configuration. The two-ESG configuration would be used if an error rate test is needed for the additional R-SCH<sub>1</sub>.

**NOTE** For a two-ESG configuration, the even second clock and the 10 MHz reference are connected to ESG 1, while the chip clock, if it is being used in place of the 10 MHz reference, is connected to both ESGs.



1. Setup the equipment as shown in the above diagram and configure appropriately, depending on the connections and the number of ESGs used (refer to “[Single-ESG Reverse Link Configuration](#)” on page 2-30 or “[Two-ESG Reverse Link Configuration](#)” on page 2-36).

**NOTE** If an external chip clock is being connected to the DATA CLOCK BNC input, on the ESG front panel, instead of using an external 10 MHz reference, ensure that the **BBG Data Clock Ext Int** softkey has **Ext** highlighted.

2. Select the appropriate Trigger Edge field state (falling or rising) for the input BTS even second clock.

3. Configure and turn on the channels to be tested, ensuring that the pilot channel is used in RC3 and RC4.
4. Turn on the CDMA2000 personality and ensure that the I/Q annunciator is displayed.

---

**NOTE**      If this is a two-ESG configuration, refer to “[Generate the Signal at the RF Output \(Two-ESG Reverse Link\)](#)” on page 2-44 for instructions on activating the CDMA2000 personality.

---

5. Place the BTS in test mode.
6. Request the BTS to report the number of frames, symbols, or bits in error.
7. Perform any of the measurements as needed.



---

## Troubleshooting

Use the following checklists to help troubleshoot problems with Option 201.

---

**NOTE** In some cases, the ESG may allow invalid channel coding settings without reporting an error. If you experience problems, ensure that the settings of the ESG conform to IS-2000 standards.

---

### Tips and Tricks

There is a Tips and Tricks section located on the Agilent Technologies ESG support web site that may provide you assistance in the operation of the Option 201 firmware. Perform the following steps to reach the appropriate web page:

1. Go to [www.agilent.com/find/esg](http://www.agilent.com/find/esg).
2. Select your ESG model under the Products list.
3. Select Software Patches and Drivers in the next window under the Additional Information list.
4. Select the firmware version currently loaded on your ESG, shown under the Software Updates section.

The firmware version is displayed when the ESG is powered on or it can be viewed by pressing the following keys and viewing the listed field:

**Utility > Instrument Info/Help Mode > Diagnostic Info > Firmware Revision**

5. Locate the Tips and Tricks section and follow any instructions that may be appropriate to your situation.

### Cannot Turn on CDMA2000

- At least one cdma2000 channel must be on.

### ESG 10 MHz External Reference will not Lock

- The down-converted 10 MHz reference from the transmitter tester (signal analyzer), is not accurate enough to allow the ESG to lock on to it.

### Can't See Channels Displayed on Transmitter Tester

Ensure that the following are true:

- cdma2000 channels are on.
- cdma2000 personality is on (CDMA2K and I/Q annunciators are displayed). I/Q must be toggled on to modulate the RF output.
- ESG RF output is on (RF ON annunciator is displayed).
- ESG RF is modulated (MOD ON annunciator is displayed). On a two-ESG configuration, this would apply to ESG 1.

- ❑ **BTS** is underscored for forward link and **MS** is underscored for reverse link on the Device **BTS MS** softkey located on the E4406A VSA.

**Mode Setup > Radio > Device BTS MS**

- ❑ The long code mask for reverse link (MS) on the E4406A VSA is set to zero.
- ❑ ESG baseband reference source is set to external (**BBG Data Clock Ext Int** softkey, **Ext** is highlighted) on both ESGs when the two-ESG configuration is used.
- ❑ ESG carrier signal power is higher than the receiver's noise floor. (Increase the ESG carrier signal power level if the signal cannot be seen on the transmitter tester.)
- ❑ ESG OCNS channel power level is sufficient to increase the code domain power to the appropriate level without interfering with the other channels. (OCNS channel power may need to be reduced.)
- ❑ ESG active channels do not have conflicting Walsh codes.
- ❑ ESG 2 was turned on prior to ESG 1. Refer to the appropriate two-ESG RF signal generation procedure ("[Generate the Signal at the RF Output \(Two-ESG Forward Link\)](#)" on page 2-17 or "[Generate the Signal at the RF Output \(Two-ESG Reverse Link\)](#)" on page 2-44). If ESG 2 has been turned off and then turned back on while ESG 1 is transmitting, the signal will be affected.
- ❑ **I/Q Source** has been set to **Ext I/Q** for ESG 1, on a two-ESG configuration.

**I/Q > I/Q Source > Ext I/Q**

**When Programming Two ESGs, Both Signal Generators Display the Same Values**

- ❑ Each ESG must have a unique GPIB address.

**Utility > GPIB/RS2-32 > GPIB Address**

**IQ Map Rotation Does Not Switch from Std. to Rotated**

- ❑ Turn off 1 or 2 of the 4 channels. IQ Map Rotation is not allowed with 4 channels on.

**Reverse Link Frame Error Rate too High**

- ❑ Check that the relative power level difference among the active channels is not significant.
- ❑ Ensure that the Walsh code and data rate combination are compliant with IS-2000 specifications.

### 3 Softkey Reference

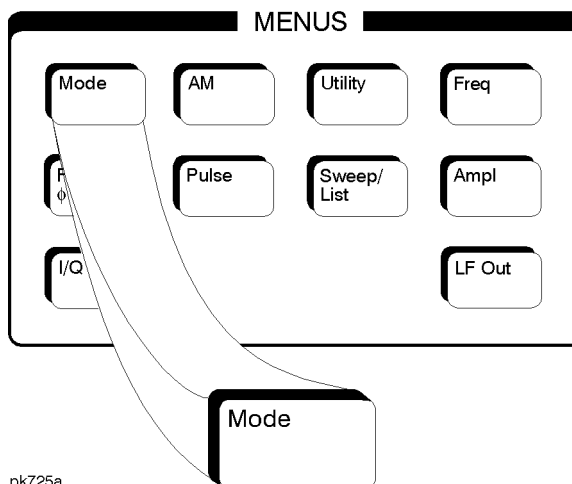
This chapter lists, in alphanumerical order, the softkeys and associated data fields available with Option 201.

Navigate among the data field entries using either the front panel knob or the arrow keys.

For the SCPI commands that duplicate some of these softkeys remotely, see [Chapter 5, "Remote Programming and Examples."](#)

To access the Option 201 softkeys, use the front panel **Mode** key.

If your signal generator has multiple options, the softkeys in the first menu enable you to access the various options. Press **Real Time I/Q BaseBand** to display the **CDMA** softkey.

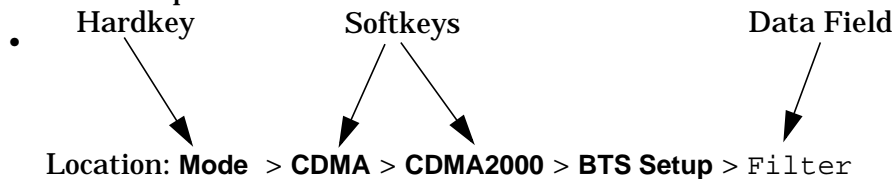


pk725a

**NOTE**

- The key paths provided in this chapter do *not* include the **Real Time I/Q BaseBand** softkey.
- If you do not see a softkey in the indicated menu, it may be on the next page of that menu; to display the next page, press the **More** softkey. Hardkeys and softkeys are denoted by **Bold** text; data fields by Courier Font.

For example:



- All softkey and data field location pathways assume a factory preset condition.

---

## Symbols

### % Power Other ESG

This field is used when a two-ESG system is being configured. After setting the channel powers of both ESGs, edit this field by entering the percent power value of the ESG that is paired with this one. The entered value sets up the parameters that will allow the scale to 0 db function to scale all active channels to 0 dB. See [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15.

---

#### NOTE

For the single ESG setup, this field needs to be 0.0 percent.

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > 2 Box Setup > % Power Other ESG**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup > % Power Other ESG**

### % Power This ESG

This field displays the percent power value of the ESG and is used when configuring a two-ESG system. Enter this value in the Percent Power Other ESG data field of the ESG that is paired with this ESG. See [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15.

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > 2 Box Setup > % Power This ESG**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup > % Power This ESG**

---

## Numerics

### 2 Box Setup

This key displays a table editor and softkeys that allow you to select and modify the parameters of the IQ voltage scale as well as adjust the total code domain power to 0 dB for the two-ESG configuration. See “[IQ Voltage Scale](#)” on page 3-53.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > 2 Box Setup**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup**

### 307.2 Khz Clock

This key selects a 307.2 kHz clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Reverse link radio configuration 1 or 2 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > BNC MUX Settings > Data Clk Out > 307.2 Khz Clock**

### 4.8 Khz Clock

This key selects a 4.8 kHz clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Reverse link radio configuration 1 or 2 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > BNC MUX Settings > Data Clk Out > 4.8 Khz Clock**

### 5ms Clock

This key selects a 5 ms clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out > 5ms Clock**

### 10ms Clock

This key selects a 10 ms clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out > 10ms Clock**

### 20ms Clock

This key selects a 20 ms clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Available in reverse link radio configurations 1 through 4.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out > 20ms Clock**

### 40ms Clock

This key selects a 40 ms clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out > 40ms Clock**

### 80ms Clock

This key selects an 80 ms clock as the output at the DATA CLK OUT rear panel BNC/SMB connector. Available in reverse link radio configuration 1 through 4.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out > 80ms Clock**

---

## A

### Adjust Code Domain Power

This key accesses a menu where you can adjust the code domain power to 0 dB, while either maintaining the existing power ratios or setting all power levels equal to one another.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > Adjust Code Domain Power**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Adjust Code Domain Power**

### APCO 25 C4FM

This key, located in the Select (Filter) menu, selects an APCO 25 specified C4FM filter. This is a Nyquist filter with an alpha of 0.2 that is combined with a shaping filter.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > APCO 25 C4FM**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > APCO 25 C4FM**

### Apply Bit Errors

This key appears in two places. Option UN7 is required.

#### Create File/Edit File Menu

This menu enables you to enter a specific number of bit errors or a percentage of bit errors in the current file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors**

### **Bit Errors Menu**

The **Apply Bit Errors** key, in the Bit Error Menu, applies the currently selected bit-error percentage or number of bit errors to the current file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors > Bit Errors (percent value) or Bit Errors (numeric value) > Apply Bit Errors**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors > Bit Errors (percent value) or Bit Errors (numeric value) > Apply Bit Errors**



---

## B

### BBG Data Clock Ext Int

This key selects external or internal mode for the baseband generator data clock source.

**Ext** External uses the signal applied to the DATA CLOCK input as the data clock source.

**Int** Internal uses the internal data clock as the data clock source.

Default: Int

Softkey Location: **Mode > CDMA > CDMA2000 > BBG Data Clock Ext Int**

## Beta

This key is activated automatically when you select the Kaiser windowing function. The default Beta factor provides a good solution for optimizing out-of-band performance, adjacent channel power (ACP), without seriously compromising passband performance, error vector magnitude (EVM).

Changing the Beta factor adjusts the trade-off between ACP and EVM:

- Decreasing the value improves EVM.
- Increasing the value improves ACP.

Range: 1.000 through 10.000

Default: 4.000

Softkey Location: **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian or Rectangle > Window > Kaiser > Beta**

## Bit Errors (numeric value)

This key enables you to specify the number of bit errors applied to the current file when you press the **Apply Bit Errors** terminator softkey. The percent **Bit Errors** softkey also updates to reflect the percentage of bit errors you have chosen.

Range: 0 through 98812

Default: 0

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors > Bit Errors (numeric value)**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors > Bit Errors (numeric value)**

## Bit Errors (percent value)

This key enables you to specify the percentage of bit errors applied to the current file when you press the **Apply Bit Errors** terminator softkey. The numeric value **Bit Errors** softkey also updates to reflect the number of bit errors you have chosen.

Range: 0.00 to 100

Default: 0.00

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH or F-PCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors > Bit Errors (percent value)**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Create File or Edit File > Apply Bit Errors > Bit Errors (percent value)**

## BNC MUX Settings

This key accesses a menu from which you can modify the output of the following rear panel BNC/SMB connectors:

- EVENT 1 (Forward and Reverse Link)
- DATA OUT (Forward and Reverse Link)
- DATA CLK OUT (Reverse Link Only)
- SYMBOL SYNC OUT (Reverse Link Only)

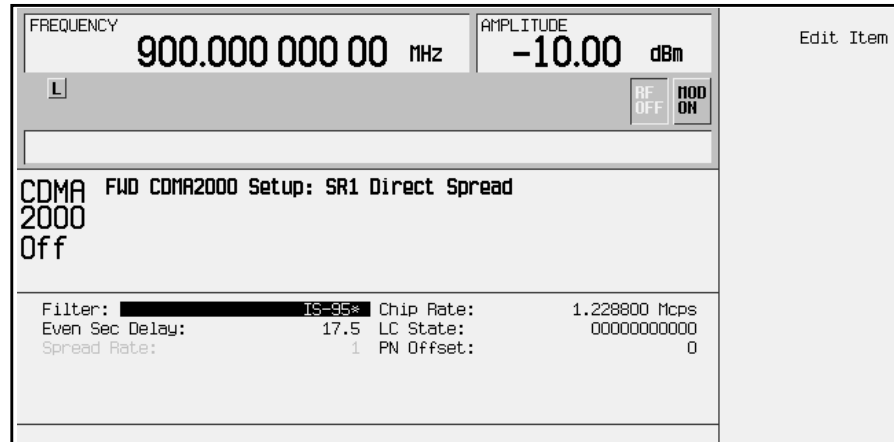
Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BNC MUX Settings**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings**

## BTS Setup

This key enables a table editor from which you can select and modify the parameters of the base transceiver station. Highlight the parameter you want to change and press the **Edit Item** softkey. Press a softkey or use the numeric keypad to change values contained in the table and press the appropriate softkey to terminate the entry.

The following figure shows an example of the forward link display for the BTS setup table editor.



Softkey Location: **Mode > CDMA > CDMA2000 > BTS Setup**

---

## C

### Cdma Freq

This field displays the current CDMA channel frequency used to communicate with the mobile. To change the frequency, press the **Edit Item** softkey and enter the new value.

Range: 0 through 2047

Default: 50

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > Cdma Freq**

### CDMA2000

This key selects an advanced derivative of the TIA/EIA-95-B CDMA system. The interim standard name is IS-2000. "cdma2000" is the commercial name for the system.

Softkey Location: **Mode > CDMA > CDMA2000**

### CDMA2000 Off On

This key turns the cdma2000 modulation on or off. One channel, at least, must be on before the switching on cdma2000.

Default: Off

Softkey Location: **Mode > CDMA > CDMA2000 > CDMA2000 Off On**

### Channel Number

This key selects the channel to be configured. Four channel selections are available, each corresponding to a CDMA channel type.

Range: 1 through 4

Default: 1

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > Channel Number**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Number**

## Channel Setup

This key moves the cursor to the table editor of the display from which you can select and modify the parameters of the selected channel.

The ESG can be configured with up to four different channels or seven in a two-ESG solution depending on the radio configuration and link selection (forward or reverse).

### **Channel 1, Forward Link:**

Channel 1 has one channel type, forward pilot channel (F-PICH) and is available in radio configurations (RC) 1 through 5.

F-PICH is used to provide a phase reference for coherent demodulation and provide signal strength adjustments from the base station to the mobile.

The data field that you are able to configure and set up is listed below.

<b>Data Field</b>	<b>F-PICH</b>
Power	RC 1-5

For information on the data field, refer to the data field name in this chapter.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > Channel Setup**

**Channel 1, Reverse Link:**

Channel 1 has four different channel types: reverse access channel (R-ACH), reverse fundamental channel (R-FCH), reverse supplemental channel (R-SCH), and reverse pilot channel (R-PICH). These channel types are used by the mobile to communicate to the base station.

For Channel 1, R-ACH, R-FCH, and R-SCH are available only in radio configurations (RC) 1 and 2. R-PICH is available only in RC 3 and RC 4.

R-ACH is used to communicate short signals for call origination, responses to pages, or registrations.

R-FCH is used to communicate higher-level data and control information.

R-SCH is used, in conjunction with R-FCH and other supplemental channels, to communicate higher data rate services.

R-PICH is used to provide a phase reference for coherent demodulation and provide signal strength adjustments.

The data fields that you are able to configure and set up are listed below for each channel type.

<b>Data Fields</b>	<b>R-ACH</b>	<b>R-FCH</b>	<b>R-PICH</b>	<b>R-SCH</b>
Data	RC 1-2	RC 1-2		RC 1-2
Data Rate		RC 1-2		RC 1-2
Frame Offset	RC 1-2	RC 1-2		RC 1-2
Gating Rate			RC 3-4	
PCB Data			RC 3-4	
Power	RC 1-2	RC 1-2	RC 3-4	RC 1-2

---

**NOTE**

If RC 1 or 2 is selected, only a single selectable channel is available.

For information on each data field, refer to the data field name in this chapter.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Setup**

### Channel 2, Forward Link:

Channel 2 has two different channel types, forward supplemental channel (F-SCH) and forward synchronization channel (F-SYNC). For Channel 2, F-SCH and F-SYNC are available in radio configurations 1 through 5.

F-SCH is used, in conjunction with F-FCH or F-SCH, to communicate higher data rate services.

F- SYNC is used to provide a phase reference for coherent demodulation and provide signal strength adjustments.

The data fields that you are able to configure and set up are listed below for each channel type.

Data Fields	F-SCH	F-SYNC
CDMA Freq		RC 1-5
Data	RC 3-5	
Data Rate	RC 3-5	
DAYLT		RC 1-5
F-SYNCH Type		RC 1-5
Frame Offset	RC 3-5	
LC Mask	RC 3-5	
LP_SEC		RC 1-5
LTM_OFF		RC 1-5
MIN_P_Rev		RC 1-5
MSG Type		RC 1-5
NID		RC 1-5
P_PREV		RC 1-5
Power	RC 3-5	RC 1-5
PRAT		RC 1-5
QOF	RC 3-5	
Radio Config	RC 3-5	
Reserved		RC 1-5
SID		RC 1-5
SYS TIME		RC 1-5
Turbo Coding	RC 3-5	

<b>Data Fields</b>	<b>F-SCH</b>	<b>F-SYNC</b>
Walsh	RC 3-5	RC 1-5

For information on each data field, refer to the data field name in this chapter.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup**

### **Channel 2, Reverse Link:**

Channel 2 has two different channel types, reverse dedicated control channel (R-DCCH) and reverse supplemental channel (R-SCH).

For Channel 2, R-DCCH and R-SCH are available only in radio configurations 3 and 4.

R-DCCH is used to communicate higher-level data and control information.

R-SCH is used, in conjunction with the R-FCH, to communicate higher data rate services in the two ESG solution for cdma2000. If you select R-SCH, it will disable all other channels in the ESG.

The data fields that you are able to configure and set up are listed below for each channel type.

<b>Data Fields</b>	<b>R-DCCH</b>	<b>R-SCH</b>
Data	RC 3-4	RC 3-4
Data Rate	RC 3-4	RC 3-4
Frame Length	RC 3-4	RC 3-4
Frame Offset	RC 3-4	RC 3-4
Power	RC 3-4	RC 3-4
Turbo Coding		RC 3-4
Walsh	RC 3-4	RC 3-4

For information on each data field, refer to the data field name in this chapter.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2 > Enter > Channel Setup**



**Channel 3, Forward Link:**

Channel 3 has two different channel types, forward fundamental channel (F-FCH) and orthogonal channel noise simulator (OCNS).

For Channel 3, F-FCH is available in radio configuration 1 through 5. OCNS works with channels that operate in RC 3 through RC 5.

F-FCH is used to communicate a combination of primary data, secondary data, signaling, and power control information.

OCNS is used to provide simulated noise in the channel.

The data fields that you are able to configure and set up are listed below for each channel type.

<b>Data Fields</b>	<b>F-FCH</b>	<b>OCNS</b>
Data	RC 1-5	
Data Rate	RC 1-5	
Frame Offset	RC 1-5	
LC Mask	RC 1-5	
PCntrl (Up/Dn)	RC 1-5	
P Puncturing	RC 1-5	
Power	RC 1-5	RC 3-5
QOF	RC 1-5	
Radio Config	RC 1-5	
Walsh	RC 1-5	RC 3-5

For information on each data field, refer to the data field name in this chapter.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 3 > Enter > Channel Setup**

### **Channel 3, Reverse Link:**

Channel 3 has one channel type, reverse fundamental channel (R-FCH) and is available only in radio configurations 3 and 4.

R-FCH is used to communicate higher-level data and control information. R-FCH can be used in conjunction with supplemental channels to communicate higher data rate services.

The data fields that you are able to configure and set up are listed below.

<b>Data Fields</b>	<b>R-FCH</b>
Data	RC 3-4
Data Rate	RC 3-4
Frame Length	RC 3-4
Frame Offset	RC 3-4
Power	RC 3-4
Walsh	RC 3-4

For information on each data field, refer to the data field name in this chapter.

**Softkey Location: Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 3 > Enter > Channel Setup**

**Channel 4, Forward Link:**

Channel 4 has three different channel types, forward paging channel (F-PCH), forward supplemental channel (F-SCH), and quick paging channel (QPCH).

For Channel 4, F-PCH is available in radio configurations 1 through 5. F-SCH and QPCH are available only in RC 3 through RC 5.

F-PCH is used to communicate control information and send pages from the base station to the mobile.

F-SCH is used to communicate higher rate data and control information.

QPCH is used to alert the mobile to receive a forward paging channel in the paging frame.

The data fields that you are able to configure and set up are listed below for each channel type.

<b>Data Fields</b>	<b>F-PCH</b>	<b>F-SCH</b>	<b>QPCH</b>
Config Change		RC 3-5	RC 3-5
Data	RC 1-5	RC 3-5	
Data Coding		RC 3-5	
Data Rate	RC 1-5	RC 3-5	RC 3-5
Frame Offset		RC 3-5	
LC Mask	RC 1-5	RC 3-5	
Paging Indicator		RC 3-5	RC 3-5
Power	RC 1-5	RC 3-5	RC 3-5
QOF		RC 3-5	
RC		RC 3-5	
Turbo Coding		RC 3-5	
Walsh	RC 1-5	RC 3-5	RC 3-5

For information on each data field, refer to the data field name in this chapter.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Setup**

**Channel 4, Reverse Link:**

Channel 4 has three different channel types: reverse common control channel (R-CCCH), reverse enhanced access channel (R-EACH), and reverse supplemental channel (R-SCH).

For Channel 4, R-CCCH, R-EACH, and R-SCH are available only in radio configurations 3 and 4.

R-CCCH is used to communicate digital control information from the mobile to the base station.

R-EACH is used to communicate short messages.

R-SCH is used with the R-FCH to communicate higher data rate services in the two-ESG solution for cdma2000. The R-SCH can be also used in a single-ESG solution.

The data fields that you are able to configure and set up are listed below for each channel type.

<b>Data Fields</b>	<b>R-CCCH</b>	<b>R-EACH</b>	<b>RSCH</b>
Data	RC 3-4	RC 3-4	RC 3-4
Data Rate	RC 3-4	RC 3-4	RC 3-4
Frame Length	RC 3-4	RC 3-4	RC 3-4
Frame Offset	RC 3-4	RC 3-4	RC 3-4
Power	RC 3-4	RC 3-4	RC 3-4
Turbo Coding			RC 3-4
Walsh	RC 3-4	RC 3-4	RC 3-4

For information on each data field, refer to the data field name in this chapter.

**Softkey Location: Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 4 > Enter > Channel Setup**

## Channel State Off On

This key turns the channel operating state off or on.

Default: Off

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 1, 2, 3, or 4 > Enter > Channel State Off On**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 1, 2, 3, or 4 > Enter > Channel State Off On**

Softkey Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel State Off On**

## Channel Type

This key accesses a menu from which you can select different channel types.

### Forward:

Channel Type	Chan. #1	Chan. #2	Chan. #3	Chan. #4
F-FCH			RC 1-5, 3*	
F-PCH				RC 1-5
F-PICH	RC 1-5, 3*			
F-SCH		RC 3*-5		RC 3*-5
F-SYNCH		RC 1-5		
OCNS			RC 3-5	
QPCH				RC 3-5

Default:\*

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 1, 2, 3, or 4 > Enter > Channel Type**

**Reverse:**

<b>Channel Type</b>	<b>Chan. #1</b>	<b>Chan. #2</b>	<b>Chan. #3</b>	<b>Chan. #4</b>
R-ACH	RC 1-2			
R-CCCH				RC 3-4
R-DCCH		RC 3*-4		
R-EACH				RC 3-4
R-FCH	RC 1-2		RC 3*-4	
R-PICH	RC 3*-4			
R-SCH	RC 1-2	RC 3-4**		RC 3*-4

Default: \*

\*\*Only for two-ESG solution.

Softkey Location (Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type**

Softkey Location (Reverse RC 3): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2 or 4 > Enter > Channel Type**

Softkey Location (Reverse RC 4): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 4 > Enter > Return > Link Control > 2 or 4 > Enter > Channel Type**

**Channel Type  
F-FCH OCNS**

This key appears when forward channel 3 is the active channel. This key selects either a forward fundamental channel or an orthogonal noise simulator channel.

**F-FCH**            The forward fundamental channel is the primary traffic channel for voice and low-speed data.

**OCNS**            The orthogonal noise simulator ensures a total code domain power of 0 dB.

Default: F-FCH

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 3 > Enter > Channel Type F-FCH OCNS**

## Channel Type F-SYNCH F-SCH

This key appears when forward channel 2 is the active channel. This key selects either a forward synchronization channel or a forward supplemental channel.

**F-SYNCH**      This key selects a synchronization channel for transmitting data.

**F-SCH**         This key provides an additional channel for supplemental data.

Default: F-SYNCH

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Type F-SYNCH F-SCH**

## Channel Type R-DCCH R-SCH

This key appears when RC 3 or 4 is selected in reverse link and channel 2 is the active channel. This key selects either a reverse dedicated control channel or reverse supplemental channel.

**R-DCCH**        The reverse dedicated control channel is used to communicate higher-level data and control information.

**R-SCH**         The reverse supplemental channel is used, in conjunction with the R-FCH, to communicate higher data rate service.

Default: R-DCCH

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2 > Enter > Channel Type R-DCCH R-SCH**

## Chip Clock

This key selects the chip clock as the output at the DATA CLK OUT rear panel BNC/SMB connector.

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out > Chip Clock**

## Chip Rate

This field displays the current chip rate. The chip rate is equivalent to the spreading rate of the channel. Spreading rate 1 (SR1) is 1.2288 Mcps. The default value is in accordance with the IS-2000 specification. To change the chip rate, press the **Edit Item** softkey and enter the new value.

Range: 50 cps through 1.3 Mcps

Default: 1.2288 Mcps

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Chip Rate**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Chip Rate**

## Coded RCCCH

This key selects the baseband reverse common control channel data as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Coded RCCCH**

## Coded RDCCH

This key selects the baseband reverse dedicated control channel data as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Coded RDCCH**

## Coded REACH

This key selects the baseband reverse enhanced access channel data as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Coded REACH**

## Coded RFCH

This key selects the baseband reverse fundamental channel data as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Coded RFCH**



## Coded RSCH

This key selects the baseband reverse supplemental channel data as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Coded RSCH**

## Config Change

This field displays the status of the configuration change bits in the quick paging channel (QPCH). These bits are used by the base station to notify the mobile that a configuration change is required.

The 80 ms QPCH slot is divided into 4 equal portions. The last 2 bits of the second and fourth portions are the configuration change bits. These bits can be enabled or disabled by setting a value from 0 through 3 in the Config Change field. To edit the value, press the **Edit Item** softkey and enter a new value. The following table shows which bits are enabled for the values allowed:

<b>Config Change Value</b>	<b>Bits Enabled</b>
0	All bits off
1	Last 2 bits of 2nd portion on
2	Last 2 bits of 4th portion on
3	Last 2 bits of 2nd and 4th portions on

Range: 0 through 3

Default: 3

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > QPCH > Channel Setup > Config Change**

## Copy File

This key copies the current file. You can then edit the new file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Copy File**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Copy File**

## Create File

This key creates a new bit file named `Untitled` and opens the bit file editor. With the softkeys that are displayed with this file, you can enter information, rename the file, copy the current file to a new file, and delete rows.

Softkey Location (Forward): **Mode > CDMA > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Create File**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Create File**

---

## D

### Data

This field displays the data selection for the current channel. To change the data selection, press the **Edit Item** softkey and select from the softkey menus presented.

Default: PN9

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH or F-PCH > Channel Setup > Data**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data**

Data Field Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Data**

### Data Clk Out

This key accesses a menu from which you can modify the clocked output at the DATA CLK OUT rear panel BNC/SMB connector in reverse link mode. Items selected from the accessed menu may change when switching between radio configuration 1 or 2 and radio configuration 3 or 4.

Default: Chip Clock

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Clk Out**

## Data Out

This key accesses a menu from which you can modify the output at the DATA OUT rear panel BNC/SMB connector. In reverse link, an item selected from the accessed menu may change when switching between radio configuration 1 or 2 and radio configuration 3 or 4.

Default:

Forward Link: PC Ramp

Reverse Link: Long Code

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BNC MUX Settings > Data Out**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out**

## Data Rate

This field displays the current data rate. The data rates available depend on the transmission setup including the radio configuration, channel, frame length, and frame offset value.

To change the data rate, press the **Channel Setup** softkey, use the front panel knob or arrow keys and highlight the **Data Rate** field, press the **Edit Item** softkey, and enter a new value. If the field is grayed out, it cannot be edited. Values between acceptable rates will be clipped to the nearest allowed value.

Table 3-1 and Table 3-2 show the data rates for radio configurations, channel types, and frame lengths. Channels that have fixed (R-ACH, 4.8 kbps) or no data rates are not shown. Default data rates and data rates that are used only with specific frame lengths, are indicated by footnotes.

**NOTE**

When selecting a data rate for the R-SCH, you need to ensure it is compatible with the Walsh code being used. Due to the flexibility built into the ESG, it is possible to set a data rate with a Walsh code that is not within IS-2000 specifications.

**Table 3-1 Forward Link Data Rates**

Data Rate (kbps)	Forward Link			
	F-PCH	F-FCH	F-SCH	QPCH
1.2		RC 1		
1.35				
1.5		RC 3, 4		
1.8		RC 2, 5		
2.4		RC 1		RC 3-5
2.7		RC 3, 4		
3.6		RC 2, 5		
4.8	RC 1-5	RC 1, 3, 4		RC (3, 5) <sup>a</sup>
7.2		RC 2, 5		
9.6	RC (1-5) <sup>1</sup>	RC (1, 3, 4) <sup>a</sup>		
14.4		RC (2, 5) <sup>a</sup>		
19.2			RC (3, 4) <sup>a</sup>	
28.8			RC 5 <sup>a</sup>	
38.4			RC 3, 4	
57.6			RC 5	
76.8			RC 3, 4	
115.2			RC 5	
153.6			RC 3, 4	
230.4			RC 5	
307.2			RC 4	

1. Default value (ESG preset or power cycle)

**Table 3-2 Reverse Link Data Rates**

Data Rate (kbps)	Reverse Link				
	R-DCCH	R-FCH	R-SCH	R-CCCH	R-EACH
1.2		RC 1	RC 1, 3 <sup>g</sup>		
1.35			RC 3 <sup>f</sup>		
1.5		RC 3	RC 3		
1.8		RC 2, 4	RC 2, 4		
2.4		RC 1	RC 1, 3 <sup>fg</sup>		
2.7		RC 3	RC 3		
3.6		RC 2, 4	RC 2, 4		
4.8		RC 1, 3	RC 1, 3		
7.2		RC 2, 4	RC 2, 4		
9.6	RC 4 <sup>b</sup>	RC 1 <sup>a</sup> , 3 <sup>ab</sup> , 4 <sup>b</sup>	RC 1 <sup>a</sup> , 3	RC 3, 4	RC 3, 4
14.4	RC 4 <sup>a</sup>	RC 2 <sup>a</sup> , 4 <sup>a</sup>	RC 2 <sup>a</sup> , 4		
19.2			RC 3	RC 3, 4	RC 3, 4
28.8			RC 4		
38.4			RC 3	RC (3, 4) <sup>abc</sup>	RC (3, 4) <sup>abc</sup>
57.6			RC 4 <sup>e</sup>		
76.8			RC 3 <sup>e</sup>		
115.2			RC 4 <sup>d</sup>		
153.6			RC 3 <sup>d</sup>		
230.4			RC 4 <sup>a</sup>		
307.2			RC 3 <sup>a</sup>		

- a. Default value (ESG preset or power cycle)
- b. Default value for 5 ms frame length
- c. Default value for 10 ms frame length
- d. Default value for 40 ms frame length
- e. Default value for 80 ms frame length
- f. 40 ms frame length value
- g. 80 ms frame length value

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > Channel Number > 2, 3, or 4 > Channel Type > F-SCH, F-FCH, F-PCH, or QPCH > Channel Setup > Data Rate**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data Rate**

## DAYLT

This field displays the current daylight saving time offset status for the F-SYNCH. Choices are 00 (off) or 01 (on).

Default: 00

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > DAYLT**

## Default Message

This key selects the default message for the forward paging channel (F-PCH). When this key is selected, the word `DEFAULT` will appear in the `Data` field indicating that the default message is now ready to use.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-PCH > Channel Setup > Data > Edit Item > Default Message**

## Define User FIR

This key displays a table editor from which you can create and modify FIR filters. The FIR table editor allows a maximum filter length of 1024 coefficients, but the signal generator hardware is limited to 256 coefficients and 32 symbols. The number of symbols equals the number of coefficients divided by the oversample ratio.

---

**NOTE** If you enter more than 32 symbols or 256 coefficients, the signal generator cannot use the filter.

---

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR**

## Delayed 20ms Trigger

This key selects a signal output for the EVENT 1 rear panel BNC/SMB connector that identifies the location of the 20 ms data frame boundary.

Softkey Location: **Mode > CDMA > CDMA2000 > BNC MUX Settings > Event 1 > Delayed 20ms Trigger**

## Delayed 80ms Trigger

This key selects a signal output at either the EVENT 1 or DATA OUT rear panel BNC/SMB connector that identifies the location of every third PN sequence, as well as every fourth 20 ms data frame boundary.

Softkey Location: **Mode > CDMA > CDMA2000 > BNC MUX Settings > Event 1 or Data Out > Delayed 80ms Trigger**

## Delayed Even Second

This key selects an even second clock pulse with adjustable delay at the EVENT 1 rear panel BNC/SMB connector. The even second output provides a pulse every two seconds, which is used to synchronize other instruments in the test system.

The even second delay can be adjusted to align the frame timing with the RF output. Refer to “[Forward and Reverse Link I/O Signal Descriptions and Timing Relationships](#)” on page 4-9.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BNC MUX Settings > Event 1 > Delayed Even Second**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Event 1 > Delayed Even Second**

## Delete

This key accesses a menu from which you can select different ways of removing bits from a User File.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Delete**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Delete**



## Delete All Rows

This key deletes all rows of the current data table. You are prompted for confirmation.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Delete All Rows**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Delete All Rows**

## Delete Bits

This key deletes the specified number of bits from the currently highlighted position.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Delete > Number of Bits > Delete Bits**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Delete > Number of Bits > Delete Bits**

## Delete File

This key deletes the highlighted file from the displayed catalog. You are prompted for confirmation.

Delete File is located in catalogs of files.

## Delete To Beginning

This key deletes all bits from the currently highlighted bit to the beginning of the file.

Delete to Beginning is located in the bit file table editor menus.

## Delete To End

This key deletes all bits from the currently highlighted bit to the end of the file.

Delete To End is located in the bit file table editor menus.

## Delete Row

This key deletes the highlighted row in the current table.

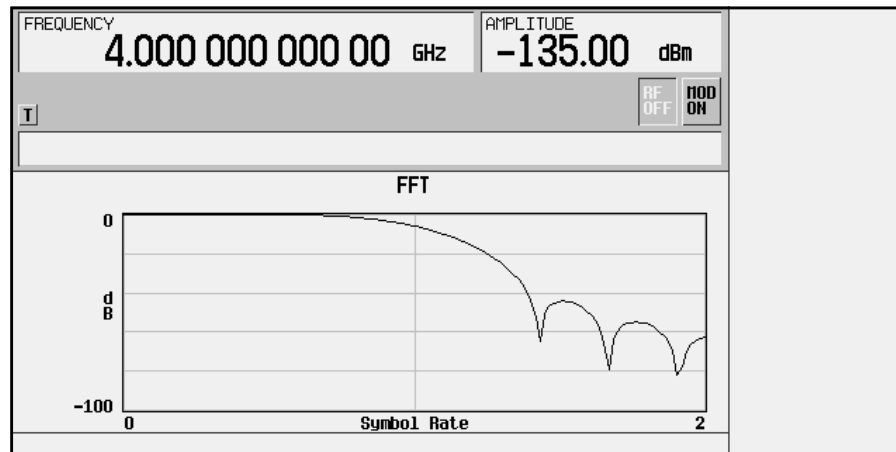
Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Delete Row**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User File > Delete Row**

## Display FFT

This key displays a graphical representation of the filter frequency response of a filter loaded into the FIR table editor (calculated using a fast Fourier transform). The following is an example of the frequency response of a Root Nyquist filter with an oversample ratio of 4.

To return to the FIR table editor and the menu keys, press **Return**.



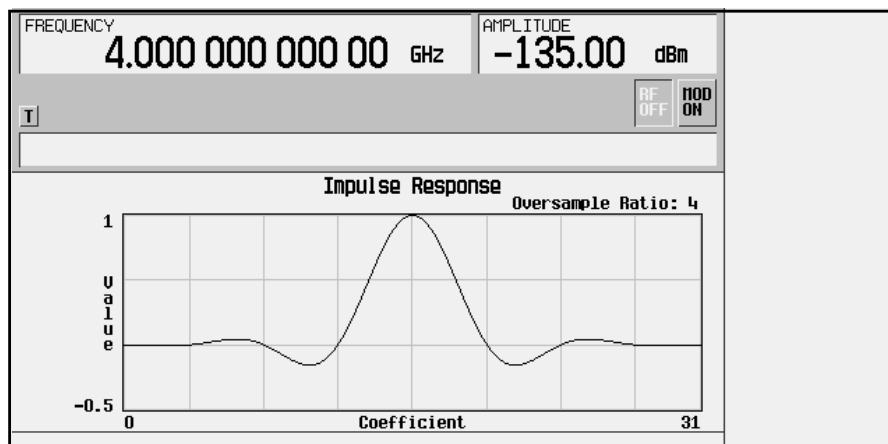
Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Display FFT**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User File > Display FFT**

## Display Impulse Response

This key displays a graphical representation of the filter impulse response over time of the filter loaded into the FIR table editor. The following is an example of the impulse response of a Root Nyquist filter with an oversample ratio of 4.

To return to the FIR table editor and the menu keys, press **Return**.



Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Display Impulse Response**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User File > Display Impulse Response**

---

## E

### Edit File

This key enables you to begin editing the selected file in the **User File** directory. You are asked to confirm converting binary files to bit files for editing.

---

#### NOTE

There is no undo capability; bit files are saved after each modification.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File**

### Edit Item

This key allows the highlighted field value in the displayed table to be edited. For some fields, it accesses softkey selections.

**Edit Item** is located in the setup menus for the BTS, mobile, and channels. It is also located under the **Define User Fir** softkey.

### Equal Powers

This key adjusts all channel powers to equal power settings that sum to 0 dB.

---

#### NOTE

This key is valid only for a single ESG configuration.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > Adjust Code Domain Power > Equal Powers**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Adjust Code Domain Power > Equal Powers**

## Even Sec Delay

This field displays the current value for the delay that aligns the RF with the even second clock pulse. To change the delay value, press the **Edit Item** softkey and enter a new value.

Range: 0.5 cps through 128 cps

Default: 17.5 cps

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Even Sec Delay**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Even Sec Delay**

## Even Second

This key selects the even second pulse as the output at the SYMBOL SYNC OUT rear panel BNC/SMB connector. This is an internal timing signal on the baseband generator. It precedes the actual RF output by approximately 18 chips.

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Symbol Sync Out > Even Second**

## Event 1

This key accesses a menu from which you can select the output signal of the EVENT 1 rear panel BNC/SMB connector. In reverse link, an item selected from the accessed menu may change when switching between radio configuration 1 or 2 and radio configuration 3 or 4.

Default: Delayed Even Second

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BNC MUX Settings > Event 1**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Event 1**

## Ext

This key selects an external data source as the modulating data stream. See "[Front Panel BNC/SMB Inputs](#)" on page 4-9.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH or F-FCH > Channel Setup > Data > Edit Item > Ext**

### Ext Cdma Freq

This field becomes active when the F-SYNC TYPE is **IS2000**. This field sets the extended CDMA channel frequency that the mobile should be adjusted to receive.

If this field is grayed-out, it indicates that this parameter is currently unavailable.

Range: 0 through 2047 Hz

Default: 0

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Type > F-SYNCH > Channel Setup > EXT Cdma Freq**

---

## F

### Falling

This key configures the ESG to trigger on the falling edge of the signal applied to the PATTERN TRIG IN rear panel BNC/SMB connector.

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Trigger Edge > Edit Item > Falling**

### F-PCH

This key selects a forward paging channel, which is the digital control channel for the forward link.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-PCH**

### F-SCH

This key selects a forward supplemental channel that operates in conjunction with the forward fundamental channel (F-FCH) to provide a higher data rate service.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-SCH**

### F-SYNCH Type

This field displays the forward synchronization type. To change the type, press the **Edit Item** softkey and select a synchronization type from the displayed menu.

Default: JSTD8

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > F-SYNCH Type**

## Field1

This key accesses a menu from which you can set the field 1 hexadecimal value for the forward paging long code mask. The default value is in accordance with the IS-2000 specification.

Range: 0 through 1FFF

Default: 18CD

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-PCH > Channel Setup > LC Mask > Edit Item > Field1**

## Field2

This key accesses a menu from which you can set the field 2 hexadecimal value for the forward paging long code mask. The default value is in accordance with the IS-2000 specification.

Range: 0 through 1F

Default: 00

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-PCH > Channel Setup > LC Mask > Edit Item > Field2**

## Field3

This key accesses a menu from which you can set the field 3 hexadecimal value for the forward paging long code mask. The default value is in accordance with the IS-2000 specification.

Range: 0 through FFF

Default: 000

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-PCH > Channel Setup > LC Mask > Edit Item > Field3**

## Filter

This field displays the currently selected filter type. To change the filter selection, press the **Edit Item** softkey. In the displayed menu you can use either the **Select** or **Define User FIR** softkey to select a filter type.

Default:

Forward Link: IS-95 w/EQ

Reverse Link: IS-95 Mod

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter**



## Filter Alpha

This key is accessed through either the **Select (Filter)** menu or the **Load Default FIR** menu from which you can change the FIR filter alpha parameter.

### In the Select (Filter) Menu

This menu enables you to change the alpha parameter of the selected Root Nyquist or Nyquist filter.

This key appears only after you choose a Root Nyquist or Nyquist filter. If a Gaussian filter is used, you will see **Filter BbT**. If any other filter is selected, you will see a **Filter Factor N/A** softkey that is grayed-out.

Range: 0.000 through 1.000

Default: 0.220

---

### NOTE

---

The default value of 0.220 or any entered value will change to 0.500 when the **Restore Default Filter** softkey is selected.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Nyquist or Root Nyquist > Filter Alpha**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Nyquist or Root Nyquist > Filter Alpha**

### In the Load Default FIR Menu

This key enables you to restore the default alpha parameter of the Root Nyquist or Nyquist filter coefficients loaded into the FIR table editor.

The filter alpha value is set to 0.350 at the factory. This value is not affected by a signal generator preset or by a power cycle.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Nyquist or Root Nyquist > Filter Alpha**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist or Nyquist > Filter Alpha**

## Filter BbT

This key is accessed through either the **Select (Filter)** menu or the **Load Default FIR** menu where you can change the bandwidth-multiplied-by-bit-time filter parameter.

### In the Select (Filter) Menu

This menu enables you to change the BbT parameter of the selected Gaussian filter.

This key appears only after you choose a Gaussian filter. If a Root Nyquist or Nyquist filter is in use, you will see **Filter Alpha**. If any other filter is selected, you will see a **Filter Factor N/A** softkey that is grayed-out.

Range: 0 through 1.00

Default: 0.500

---

#### NOTE

The default value of 0.500 or any entered value will change to 0.300 when the **Restore Default Filter** softkey is selected.

---

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Gaussian > Filter BbT**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Gaussian > Filter BbT**

### In the Load Default FIR Menu

This key enables you to restore the default BbT parameter of the Gaussian filter coefficients loaded into the FIR table editor.

The Gaussian filter value is set to 0.500 at the factory. This value is not affected by a signal generator preset or by a power cycle.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Gaussian > Filter BbT**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Gaussian > Filter BbT**

## Filter Factor N/A

This grayed-out softkey is displayed when the filter in use does not contain an adjustable alpha or BbT parameter (such as the IS-95 filter selections or a user-defined FIR filter). This softkey changes to **Filter Alpha** when Root Nyquist or Nyquist is selected, and **Filter BbT** when Gaussian is selected.

Softkey Location: **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item**

## Filter Symbols

This key enables you to define the number of symbols for the filter to be loaded into the FIR table editor. Although the FIR table editor allows a maximum of 32 symbols, with a maximum oversample ratio of 32, the selected FIR filter cannot have more than 256 coefficients. Select the number of symbols and the oversample ratio accordingly. A FIR filter with greater than 16 symbols will decrease the maximum symbol rate by half.

The filter symbols are set to 8 at the factory. This state is not affected by a signal generator preset or by a power cycle.

Range: 1 through 32

Default: 8

Softkey Location (Forward): **Mode > CDMA > > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Filter Symbols**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Filter Symbols**

## FIX4

This key selects a fixed 4-bit data pattern that does not change from frame to frame. The data pattern repeats and fills the frame with the selected data.

Range: 0000 through 1111 binary

Default: 0000

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH or F-FCH > Channel Setup > Data > Edit Item > FIX4**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > FIX4**

Softkey Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Data > Edit Item > FIX4**

## Frame Length

This field displays the current frame length value. A frame is a basic timing interval in the CDMA system.

The frame length depends on the radio configuration and channel type, and it affects the data rate and frame offset. Change the frame length by pressing the **Channel Setup** softkey, rotating the front panel knob, or pressing the arrow keys to highlight the **Frame Length** field. Then press the **Edit Item** softkey and enter a new value. If the field is grayed-out, you cannot change the value.

The following table lists the frame lengths by channel type and the default values.

	Forward Link		Reverse Link				
Channel Type	F-PCH	R-ACH	R-DCCH	R-FCH <sup>1</sup>	R-SCH <sup>1</sup>	R-EACH	R-CCCH
Allowed Values	Not adjustable	Not adjustable	5 ms 20 ms	5 ms 20 ms	20 ms 40 ms 80 ms	5 ms 10 ms 20 ms	5 ms 10 ms 20 ms
Default	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms

1. Not adjustable in radio configurations 1 and 2.

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > F-PCH > Channel Setup > Frame Length**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Frame Length**

Data Field Location (for Reverse RC1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Frame Length**

## Frame Offset

This field displays the current frame offset value. The frame offset skews the traffic channel frames from system time in integer multiples of 1.25 ms.

The frame offset depends on the channel type, data rate, frame length, and radio configuration. Refer to the following table for available ranges:

Channel Type	Frame Offset	Frame Length (ms)
<b>Forward Link</b>		
F-FCH	0 - 15	20
F-SCH	0 - 15	20
<b>Reverse Link</b>		
R-ACH	0-15	20
R-DCCH	0 - 3	5
	0 - 15	20
R-FCH <sup>1</sup>	0 - 3	5
	0 - 15	20
R-SCH <sup>1</sup>	0 - 15	20
	0 - 31	40
	0 - 63	80
R-EACH	0 - 3	5
	0 - 7	10
	0 - 15	20
R-CCCH	0 - 3	5
	0 - 7	10
	0 - 15	20

1. For RC 1-2, the frame offset is only 0-15 with a 20 ms frame length.

Default: 0

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-FCH or F-SCH > Channel Setup > Frame Offset**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Frame Offset**

Data Field Location (for Reverse RC1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Frame Offset**

## Full

This key sets the gating rate to full causing all 16 power control groups to be transmitted. The gating rate field is only available on the reverse pilot channel.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Setup > Gating Rate > Edit Item > Full**

---

## G

### Gating Rate

This field displays the current gated transmission of the mobile and is only available on the reverse pilot channel. To change the gating rate, press the **Edit Item** softkey. The subsequent menu lets you select either full, half, or quarter gating of the power control groups for transmission.

Default: Full (16 bits)

Data Field Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Setup > Gating Rate**

### Gaussian

This key selects a Gaussian filter in either the Select (Filter) menu or the Load Default FIR menu.

#### In the Select (Filter) Menu

This key selects a Gaussian filter for use in the filter setup. Select the **Filter Bbt** softkey to change the filter bandwidth-multiplied-by-bit-time product value.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Gaussian**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Gaussian**

#### In the Load Default FIR Menu

Select the **Gaussian** softkey followed by the **Generate** softkey. This loads the FIR table editor with the coefficient values for the Gaussian filter. The filter BbT and number of filter symbols are defined with the softkeys in this menu. If you change either parameter after loading the filter coefficients, press the **Generate** softkey again.

The **Display Impulse Response** and **Display FFT** softkeys in this menu graphically display the filter as it is currently defined in the FIR table editor.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Gaussian**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Gaussian**

## Generate

This key creates a filter using the alpha value and number of symbols specified.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Generate**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Generate**

## Goto

This key displays a menu from which you can select a new position in the current table editor or list of items.

**Goto** is located in the bit file editor menu.

## Goto Bottom Row

This key moves the selection bar to the bottom row in the current table or list of items.

**Goto Bottom Row** is located in the table editor menus and in the catalogs of files.

## Goto Middle Row

This key moves the selection bar to the middle row in the current table or list of items.

**Goto Middle Row** is located in the table editor menus and in the catalogs of files.

## Goto Row

This key accesses a menu of softkeys that enable you to select a row or page in a table or list of items.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Goto Row**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Goto Row**



## **Goto Top Row**

This key moves the selection bar to the top row in the current table or list of items.

**Goto Top Row** is located in the table editor menus and in the catalogs of files.

---

## H

### Half

This key sets the gating rate to half, causing 8 power control groups (every other bit) to be transmitted. The gating rate field is available only in the reverse pilot channel.

**Softkey Location:** Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Setup > Gating Rate > Edit Item > Half

### Hamming

This key applies the Hamming windowing function to the selected filter. Windowing improves out of band performance (ACP) by smoothing the filter's transition to zero, but simultaneously degrades passband performance (EVM).

**Softkey Location (Forward):** Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Window > Hamming

**Softkey Location (Reverse):** Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Window > Hamming

### Hann

This key applies the Hann windowing function to the selected filter. Windowing improves out of band performance (ACP) by smoothing the filter's transition to zero, but simultaneously degrades passband performance (EVM).

**Softkey Location (Forward):** Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Window > Hann

**Softkey Location (Reverse):** Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Window > Hann

## Header

This key accesses a menu from which you can set the forward fundamental or supplemental channel long code mask header used to communicate with a particular mobile.

Range: 0000 through 03FF

Default: 0318

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-FCH or F-SCH > Channel Setup > LC Mask > Edit Item > Header**

---

## I

### I Out

This key outputs an internally generated I component of I/Q modulation to the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 1 or 2 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > I Out**

### Insert

This key appears in two places:

#### **In the Edit File and Create File Menus**

This key accesses a menu that enables you to insert bits or a pseudorandom bit sequence into the current user file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert**

#### **In the Insert 1's and Insert 0's Menus**

This key is used as an entry terminator causing the selected bits to be inserted into the current user file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert 1's or Insert 0's > Number of Bits (enter desired amount of bits) > Insert**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert 1's or Insert 0's > Number of Bits (enter desired amount of bits) > Insert**

## Insert 0's

This key accesses the Bit File Editor where you are able to enter the desired number of 0's at the current position in the user file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert 0's**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert 0's**

## Insert 1's

This key accesses the Bit File Editor where you are able to enter the desired number of 1's at the current position in the user file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert 1's**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert 1's**

## Insert PN9

This key appears in two places, as a menu access key and as a selection.

- As a menu access key, this key opens a menu from which you can adjust the seed of the 9-bit pseudorandom bit sequence and then insert the sequence.
- As a selection, this key inserts a specified PN9 sequence at the current position.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter . Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert PN9 > Insert PN9**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert PN9 > Insert PN9**

## Insert PN15

This softkey appears in two places, as a menu access key and as a selection.

- As a menu access key, this key opens a menu from which you can adjust the seed of the 15-bit pseudorandom bit sequence and then insert the sequence.
- As a selection, this key inserts a specified PN15 sequence at the current position.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert PN15 > Insert PN15**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Create File > Insert > Insert PN15 > Insert PN15**

## Insert Row

This key inserts a copy of the highlighted row in a table.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Insert Row**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Insert Row**

## IQ Map Rotation Std. Rotated

This key selects a standard (square) or rotated (diamond) mode for the IQ map rotation. Typically, the rotated mode is used in a multi-ESG solution or when more than two rotated channels are desired.

For forward link, it is possible to generate a third RC3, RC4, or RC5 traffic channel from ESG 2. If three traffic channels are selected, a Code Power Err message will appear. Rotating the IQ map on ESG 1 and ESG 2 changes the IQ map such that three RC3, RC4, or RC5 traffic channels may be supported on ESG 2.

By rotating the IQ maps on both ESGs, the 45 degree relative phase is maintained.

For an example, refer to the following setup in which ESG 1 is rotated from square to diamond and ESG 2 is rotated from diamond to square:

ESG 1: F-PICH and F-SYNCH rotated to diamond

ESG 2: F-FCH, F-SCH and F-SCH, RC3 rotated to square

Default: Std.

Softkey Location: **Mode > CDMA > CDMA2000 > IQ Map Rotation Std. Rotated**

## IQ Voltage Scale

This field displays the current voltage at the IQ ports. To change the voltage, press the **Edit Item** softkey and enter a new value. Since changing this value affects the total power, you will also see individual channel power adjustments. This value is assigned by performing the relative power mapping procedure. See [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15 or [“Adjust the Relative Power Mapping \(Two-ESG Reverse Link\)”](#) on page 2-42.

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### NOTE

IQ Voltage Scale is used in the two-ESG configuration to adjust the relative power values of the channels between the two signal generators. See [“Voltage Other ESG”](#) on page 3-86.

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Range: -40.0 dB through 0.00 dB

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > 2 Box Setup > IQ Voltage Scale**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup > IQ Voltage Scale**

## IS-95

This key selects a standard cdmaOne IS-95 filter.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > IS-95 and IS-2000 > IS-95**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > IS-95 and IS-2000 > IS-95**

## IS-95 and IS-2000

This key accesses a menu of IS-95 and IS-2000 filters.

Defaults:

Forward: IS-95 w/EQ

Reverse: IS-95 Mod

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > IS-95 and IS-2000**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > IS-95 and IS-2000**

## IS-95 Mod

This key selects a modified version of the standard IS-95 filter. This filter is modified for improved adjacent channel power performance. The modification is done in a manner that meets the IS-95 error function criterion.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > IS-95 and IS-2000 > IS-95 Mod**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > IS-95 and IS-2000 > IS-95 Mod**

## IS-95 w/EQ

This key selects the standard IS-95 filter with the equalizer for phase compensation required by a base station.

Softkey Location: **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > IS-95 and IS-2000 > IS-95 w/EQ**

## IS-95 Mod w/EQ

This key selects a modified version of the standard IS-95 filter. This filter is modified for improved adjacent channel power performance, and includes the equalizer for phase compensation required by a base station. The filter modification is done in a manner that meets the IS-95 error function criterion.

Softkey Location: **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > IS-95 and IS-2000 > IS-95 Mod w/EQ**



## IS2000

This key selects the forward synchronization type as defined by the IS-2000 CDMA standard.

Softkey Location: **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **2** > **Enter** > **Channel Setup** > F-SYNCH Type > **Edit Item** > **IS2000**

## IS95

This key selects the forward synchronization type as defined by the IS-95 CDMA standard.

Softkey Location: **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **2** > **Enter** > **Channel Setup** > F-SYNCH Type > **Edit Item** > **IS95**

---

## J

### JSTD8

This key selects the forward synchronization type as defined by the JSTD8 CDMA standard.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > F-SYNCH Type > Edit Item > JSTD8**

---

## K

### Kaiser

This key applies the Kaiser windowing function to the selected filter. Windowing improves out of band performance adjacent channel power (ACP) by smoothing the filter's transition to zero, but simultaneously degrades passband performance error vector magnitude (EVM).

Selecting **Kaiser** also activates the Beta factor that you adjust to change the trade-off between optimized ACP or EVM. Decreasing the Beta factor value improves EVM; increasing the value improves ACP.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Window > Kaiser**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist, Nyquist, Gaussian, or Rectangle > Window > Kaiser**

---

## L

### LC Mask

This field displays the current long code mask value (in hexadecimal). This 42-bit binary number creates the unique identity of the long code.

To change the LC Mask for the F-FCH or the F-SCH channel, edit the **Header** and the **Permuted ESN** values. To change the LC Mask for the F-PCH channel, edit the **Field1**, **Field2**, and **Field3** values.

Range: 00000000 through 3FFFFFFF

---

#### NOTE

The storage register for the Long Code Mask allows a 42-bit binary number to be entered. However, it may be possible to enter a value larger than 42 bits, and in this instance, the register value would be unknown.

Default:

Forward Link:

Channel 2: 3180000000

Channel 3: 3180000000

Channel 4: 319A020000

Reverse Link: 0000000000

Data Field Location (Forward): **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **2, 3, or 4** > **Enter** > **Channel Type** > **F-SCH, F-FCH, or F-PCH** > **Channel Setup** > LC Mask

Data Field Location (Reverse): **Mode** > **CDMA** > **CDMA2000** > **Link Forward Reverse** > **Mobile Setup** > LC Mask

### LC State

This field displays the current long code seed value (in hexadecimal) used to generate the actual long code. The long code is a PN sequence that is used for scrambling in the forward channels and spreading in the reverse channels. To change the long code seed, press the **Edit Item** softkey and enter a new value.

Range: 00000000 through 3FFFFFFF

---

#### NOTE

The storage register for the Long Code State allows a 42-bit binary number to be entered. However, it may be possible to enter a value larger than 42 bits, and in this instance, the register value would be unknown.

Default: 0000000000

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > LC State**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > LC State**

## Link Forward Reverse

The key selects forward (BTS Setup) or reverse (Mobile Setup) link.

Default: Forward

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse**

## Link Control

This key accesses a menu from which you can select a channel and modify its parameters.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control**

## Load Default FIR

This key accesses a menu of standard filters: Root Nyquist, Nyquist, Gaussian, and Rectangle. Selecting one of these filters displays a menu that is applicable to the filter type chosen. In this menu, the user will be able to select filter characteristics (if applicable), windowing, the number of symbols, and filter generation.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR**

## Load From Selected File

This key replaces the current filter information in a table editor with the information stored in the highlighted file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load/Store > Load From Selected File**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load/Store > Load From Selected File**

## Load/Store

This key accesses a menu from which you can load the current table editor with filter values from files previously stored in the signal generator memory. You are able to save data to a file or delete a file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load/Store**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load/Store**

## Long Code

This key selects the long code as the output at the DATA OUT rear panel BNC/SMB connector.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Long Code**

## Long Code Sync

This key selects a signal that indicates the beginning of the long code as the output at the SYMBOL SYNC OUT rear panel BNC/SMB connector.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Symbol Sync Out > Long Code Sync**

## LP\_SEC

This field displays the current leap seconds value. To change the leap seconds value, press the **Edit Item** softkey and enter a new value.

Range: 00 through FF hexadecimal

Default: 00

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > LP\_SEC**

## LTM\_OFF

This field displays the current offset of local time (where 1 = 30 minutes, 2 = 60 minutes, 3 = 90 minutes, and so on) from the system time. To change the offset, press the **Edit Item** softkey and enter a new value.

Range: 00 through 3F hexadecimal

Default: 00

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > LTM\_OFF**

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## M

### MIN\_P\_REV

This field displays the current minimum protocol revision level value. To change the revision level, press the **Edit Item** softkey and enter a new value.

Range: 00 through FF hexadecimal

Default: 01

Data Field Location: **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **2** > **Enter** > **Channel Setup** > MIN\_P\_REV

### Mirror Table

This key mirrors the current FIR table entries such that the table doubles in size, and the values in the top half of the table are duplicated in the bottom half of the table in reverse order.

Softkey Location (Forward): **Mode** > **CDMA** > **CDMA2000** > **BTS Setup** > *Filter* > **Edit Item** > **Define User FIR** > **Mirror Table**

Softkey Location (Reverse): **Mode** > **CDMA** > **CDMA2000** > **Link Forward Reverse** > **Mobile Setup** > *Filter* > **Edit Item** > **Define User FIR** > **Mirror Table**

## Mobile Setup

This key enables you to access the table editor from which you can select and modify the parameters of the mobile station. Highlight the parameter you want to change and press the **Edit Item** key.

The following figure shows an example of the display for the mobile setup table editor.

FREQUENCY		900.000 000 00 MHz		AMPLITUDE		-10.00 dBm		Edit Item
T				RF OFF		MOD ON		
CDMA RVS CDMA2000 Setup: SR1 Direct Spread								
2000 Off								
Radio Config:		3		Chip Rate:		1.228800 Mcps		
Filter:		IS-95 Mod*		LC State:		0000000000		
Even Sec Delay:		17.5		LC Mask:		0000000000		
Spread Rate:		1						
Trigger Advance:		18						
Trigger Edge:		Falling						

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup**

## Msg Type

This field displays the current message type value for the forward synchronization channel (F-SYNCH). The message types are displayed in hexadecimal notation. The message synchronizes the pilot PN sequence offset with the even second clock. To change the message, press the **Edit Item** softkey and enter a new value.

Range: 00 through FF hexadecimal

Default: 01

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > Msg Type**



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## N

### NID

This field displays the current network identification number for the base station. To change the identification number, press the **Edit Item** softkey and enter a new value.

Range: 0000 through FFFF hexadecimal

Default: 0001

Data Field Location: **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **2** > **Enter** > **Channel Setup** > NID

### None

This key sets no windowing for the selected filter. The filter is optimized for maximum passband performance (EVM).

Softkey Location (Forward): **Mode** > **CDMA** > **CDMA2000** > **BTS Setup** > **Filter** > **Edit Item** > **Define User FIR** > **Load Default FIR** > **Root Nyquist, Nyquist, Gaussian, or Rectangle** > **Window** > **None**

Softkey Location (Reverse): **Mode** > **CDMA** > **CDMA2000** > **Link Forward Reverse** > **Mobile Setup** > **Filter** > **Edit Item** > **Define User FIR** > **Load Default FIR** > **Root Nyquist, Nyquist, Gaussian, or Rectangle** > **Window** > **None**

### Number of Bits

This key makes the number of bits for the current operation the active entry.

**Number of Bits** is located in the bit file editor menus.

## Nyquist

This key selects the Nyquist (raised cosine) filter in either the Select (Filter) menu or the Load Default FIR menu.

### In the Select (Filter) Menu

This key selects a Nyquist filter and returns the Select (Filter) menu.

Range: 0 through 1

Default Filter Alpha: 0.220

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Nyquist**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Nyquist**

### In the Load Default FIR Menu

Press the **Nyquist** softkey followed by **Generate** to load the FIR table editor with the coefficient values for a Nyquist filter. The filter alpha and number of filter symbols are defined with the softkeys in this menu. If you change either parameter after loading the filter coefficients, press the **Generate** softkey again. The **Display Impulse Response** and **Display FFT** softkeys in this menu graphically display the filter as it is currently defined in the FIR table editor.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Nyquist**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Nyquist**

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## 0

### Optimize FIR For (N/A)

This grayed-out key is displayed until a Root Nyquist or a Nyquist filter is selected.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Optimize FIR For (N/A)**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Optimize FIR For (N/A)**

### Optimize FIR For EVM ACP

This key allows optimization of the FIR filter between error vector magnitude and adjacent channel power. This key is only activated when Root Nyquist or Nyquist is selected for the filter.

- Highlight **EVM** to optimize a filter for minimized error vector magnitude. The EVM selection provides the most ideal passband.
- Highlight **ACP** to minimize adjacent channel power and improve stopband rejection.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Root Nyquist or Nyquist > Optimize FIR For EVM ACP**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Root Nyquist or Nyquist > Optimize FIR For EVM ACP**

## Oversample Ratio

This key enables you to set the oversampling ratio to be applied to the FIR filter design in the Define User FIR menu. Although the FIR table editor allows a maximum of 32 symbols, with a maximum oversample ratio of 32, the selected FIR filter cannot have more than 256 coefficients. Select the number of symbols and the oversample ratio accordingly.

The oversample ratio is set to 4 at the factory. This state is not affected by an instrument preset or by a power cycle.

Range: 1 through 32

Default: 4

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Oversample Ratio**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Oversample Ratio**

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## P

### P Puncturing

This field displays the on/off state for power puncturing. Press the **Edit Item** key and then **Power Puncturing Off On** to toggle between the on and off states. This is valid only for non-zero long code states.

When power puncture is on, the ESG punctures the output stream to insert power control bits. When off, no power control bits are inserted.

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 3 > Enter > Channel Setup > P Puncturing**

### P\_REV

This field displays the current protocol revision level value. To change the revision level, press the **Edit Item** softkey and enter a new value.

Range: 00 through FF hexadecimal

Default: 01

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > P\_REV**

### Page Down

This key displays the next page of entries.

**Page Down** is located in the table editor menus and in the catalogs of files.

## Paging Indicator

This field selects which paging slots to enable for the quick paging channel. The slots are 80 ms in duration and start 20 ms before the zero-offset pilot PN sequence.

The slots align with the pilot PN sequence at every even second time mark ( $t \bmod 100 = 0$ , where  $t$  is the system time in 20 ms frames). The number of slots available depends on the data rate.

For example: If 50 is entered, you will only have a paging indicator at slot 50. If 191 is entered, you will enable all slots from 0 through 190 (only for a data rate of 2.4 kbps). To change the number of paging indicators, press the **Edit Item** softkey and enter a new value.

Range: 0 through 190 (with 2.4 kbps data rate)

191 enables all slots

-1 disables all slots

Range: 0 through 382 (with 4.8 kbps data rate)

383 enables all slots

-1 disables all slots

Default: 0, 4.8 kbps

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > QPCH > Channel Setup > Paging Indicator**

## Page Up

This key displays the previous page of entries.

**Page Up** is located in the table editor menus and in the catalogs of files.

## PCB Data

This field displays the current power control data bits in hexadecimal form. The PCB data field is only available on the reverse pilot channel.

The power control bits are used to increase or decrease transmitted power from the mobile to the base station. The least significant bit indicates the first of 16 power control bits in a 20 ms frame. To change the power control bits, press the **Edit Item** softkey and enter a new value.

Range: 0000 through FFFF

Default: 0000

Data Field Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Setup > PCB Data**

## PCntrl (Up/Dn)

This field displays the current number of power frame indicators. The signal generator uses the power frame indicators to command the mobile to increase or decrease power. The PCntrl (Up/Dn) field is only available on the forward fundamental channel type located on channel 3.

For example, if 4 is the selected value, it would cause the mobile to respond with 4 sequential power increases, then 4 power decreases. This pattern would continue indefinitely. To change the number of frames, press the **Edit Item** softkey and enter a new value.

Range: 1 through 80

Default: 1

---

### NOTE

PCntrl (Up/Dn) is only valid if Power Puncturing is enabled.

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 3 > Enter > Channel Setup > PCntrl (Up/Dn)**

## PC Ramp

This key selects the power control ramp as the output at the DATA OUT rear panel BNC/SMB connector.

Softkey Location: **Mode > CDMA > CDMA2000 > BNC MUX Settings > Data Out > PC Ramp**

## Permuted ESN

This key displays a menu from which you can select the permuted electronic serial number for the long code mask used to identify a particular mobile.

Range: 00000000 through FFFFFFFF

Default: 00000000

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH or F-FCH > LC Mask > Edit Item > Permuted ESN**

## Phase Polarity Normal Invert

This key selects either normal or inverted phase polarity.

- Highlight **Normal** to select the standard phase polarity for a signal.
- Highlight **Invert** to reverse the direction of phase rotation of the internal Q signal.

The choices for this softkey are shared parameters for forward and reverse link. So, if **Invert** is selected in forward link, this will be the parameter for reverse link and vice versa.

Default: Normal

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### NOTE

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When configuring a two-ESG system in forward or reverse link, **Invert** must be selected on ESG 2.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Phase Polarity Normal Invert**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Phase Polarity Normal Invert**

## Pilot

This key selects the pilot channel in the reverse link as the output at the DATA OUT rear panel BNC/SMB connector.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Pilot**

## PN9

This key selects an internally generated 9-bit pseudorandom number pattern as the data bits in various channels.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > PN Sequence > PN9**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > PN Sequence > PN9**

Softkey Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Data > Edit Item > PN Sequence > PN9**



## PN15

This key selects an internally generated 15-bit pseudorandom number pattern as the data bits in various channels.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > PN Sequence > PN15**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > PN Sequence > PN15**

Softkey Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Data > Edit Item > PN Sequence > PN15**

## PN Offset

This field displays the current pseudorandom number offset value. This is the time offset in the short sequence code assigned to each base station to give it a unique identity. To change the offset value, press the **Edit Item** softkey and enter a new value.

Range: 0 through 511

Default: 0

Data Field Location: **Mode > CDMA > CDMA2000 > BTS Setup > PN Offset**

## PN Sequence

This key displays a menu of available pseudorandom number sequences.

Range: PN9 or PN15

Default: PN9

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH or F-FCH > Channel Setup > Data > Edit Item > PN Sequence**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > PN Sequence**

Softkey Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Data > Edit Item > PN Sequence**

## PN Sync

This key selects a signal that indicates the start of the short code sequence as the output at the EVENT 1 rear panel BNC/SMB connector.

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > EVENT 1 > PN Sync**

## Power

This field displays the current channel power value. To change the channel power, press the **Edit Item** softkey and enter a new value.

Range: -40.0 dB through 0.00 dB

Default: 0.00 dB

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 1, 2, 3, or 4 > Enter > Channel Setup > Power**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 1, 2, 3, or 4 > Enter > Channel Setup > Power**

Data Field Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Power**

## Power Puncturing Off On

This key turns the power puncturing off or on. This parameter is valid only for non-zero long code states.

Default: On

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 3 > Enter > Channel Setup > P Puncturing > Edit Item > Power Puncturing Off On**

## PRAT

This field displays the current paging channel data rate value used by the base station. To change the data rate, press the **Edit Item** softkey and enter a new value.

Range: 00 through 03 hexadecimal

Default: 00

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > PRAT**

---

## Q

### Q Out-no 1/2 Chip Delay

This key outputs an internally generated Q component of I/Q modulation with no 1/2 chip offset (I and Q digital signal clocks are synchronized) to the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 1 or 2 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Q Out-no 1/2 Chip Delay**

### QOF

This field displays the current, quasi-orthogonal function channel value. To change the channel value, press the **Edit Item** softkey and enter a new value.

Range: 0 through 3

Default: 0

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 3 or 4 > Enter > Channel Type > F-FCH or F-SCH > Channel Setup > QOF**

### QPCH

This key selects a forward quick paging channel. This channel type enables the mobile to wake up and read the paging channel.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Control > 4 > Enter > Channel Type > QPCH**

### Quarter

This key sets the gating rate to one quarter causing 4 power control groups (every fourth bit) to be transmitted. The gating rate field is available only in the reverse pilot channel.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > Channel Setup > Gating Rate > Edit Item > Quarter**

---

## R

### R-ACH

This key selects a reverse access channel which is used for the transmission of short messages from a mobile to a base station. R-ACH is only available in radio configurations 1 and 2.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH**

### R-CCCH

This key selects a reverse common control channel which is used for the transmission of digital control information from a mobile to a base station.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 4 > Enter > Channel Type > R-CCCH**

### R-EACH

This key selects a reverse enhanced access channel which is used for the transmission of digital control information from a mobile to a base station while operating in the basic access mode. It is used for transmission of short messages.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 4 > Enter > Channel Type > R-EACH**

### R-FCH

This key selects a reverse fundamental channel which carries higher-level data and control information from the mobile to the base station. The channel it resides on depends on the radio configuration (RC) being used. For RC 3 and RC 4, the R-FCH is a fixed channel that does not have a softkey.

Softkey Location (for RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-FCH**

## R-SCH

This key selects a reverse supplemental channel that operates in conjunction with the reverse fundamental channel to provide a higher data rate service. The channel it resides on depends on the radio configuration (RC) being used.

Softkey Location (for RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-SCH**

Softkey Location (for RC 3): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2 (only for 2-ESG solution) or 4 > Enter > Channel Type > R-SCH**

Softkey Location (for RC 4): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 4 > Enter > Return > Link Control > 2 (only for 2-ESG solution) or 4 > Enter > Channel Type > R-SCH**

## Radio Config

This field displays the current radio configuration value. The radio configuration is a set of traffic channel transmission formats that define parameters such as data rates and modulation characteristics. Radio configurations 1 and 2 are IS-95 backwards compatible.

To change the radio configuration value, press the **Edit Item** softkey and enter in a new value.

Range:

Forward Link:  
3 through 5 (F-SCH)  
1 through 5 (F-FCH)

Reverse Link:  
1 through 4

Default: 3

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-FCH or F-SCH > Channel Setup > Radio Config**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config**

## Rectangle

This key selects a one-symbol-wide rectangle filter in either the Select (Filter) menu or the Load Default FIR menu.

### In the Select (Filter) Menu

Select a rectangle FIR filter for use in the filter setup.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Rectangle**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Rectangle**

### In the Load Default FIR Menu

Pressing the **Rectangle** softkey followed by the **Generate** softkey, loads the FIR table editor with the coefficient values for a rectangle filter.

The **Display Impulse Response** and **Display FFT** softkeys in this menu graphically display the filter as it is currently defined in the FIR table editor.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Rectangle**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Rectangle**

## Rename

This key accesses a menu from which you can rename the current file. **Rename** is located in the bit file editor menus.

## RESERVED

This field displays the current reserved bit setting for the forward synchronization channel. These reserved bits in the frame structure of this channel may be used in the future. Presently, all bits that are marked as reserved bits, should be set to "0" in all frames. The base station and mobile will ignore the reserved bits.

Default: 0

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > RESERVED**

## Reset Defaults

This key resets the current output settings of the rear panel BNC/SMB connectors to the original factory defaults.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BNC MUX Settings > Reset Defaults**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Setting > Reset Defaults**

## Restore Default Filter

This key replaces the current FIR filter with the default filter. In addition, for the filter characteristics located in the `Filter > Edit Item > Select > Nyquist, Root Nyquist, or Gaussian` path, it will change the following filter parameters to the value shown:

- Filter alpha to 0.500
- Filter Bbt to 0.300

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Restore Default Filter**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Restore Default Filter**

## Rising

This key configures the ESG to trigger on the rising edge of the signal applied to the PATTERN TRIG IN of the rear panel BNC/SMB connector.

Data Field Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Trigger Edge > Edit > Rising**

## R/F Bit

This grayed-out field text indicates that, currently, the Reserved/Flag Bit is not applicable. The Reserved Flag Bit is part of the frame quality indicators.

Default: N/A

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 3 or 4 > Enter > Channel Type > F-FCH or F-SCH > Channel Setup > R/F Bit**



## Root Nyquist

This key selects a Root Nyquist (root-raised cosine) filter in either the Select (Filter) menu or the Load Default FIR menu.

### In the Select (Filter) Menu

This key selects a Root Nyquist FIR filter and returns the Select (Filter) menu.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > Root Nyquist**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > Root Nyquist**

### In the Load Default FIR Menu

Pressing the **Root Nyquist** softkey followed by the **Generate** softkey, loads the FIR table editor with the coefficient values for a Root Nyquist filter. The filter alpha and number of filter symbols are defined with the softkeys in this menu. If you change either parameter after loading the filter coefficients, press the **Generate** softkey again.

The **Display Impulse Response** and **Display FFT** softkeys in this menu graphically displays the filter as it is currently defined in the FIR table editor.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist**

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## S

### Scale To 0dB

This key adjusts the code domain power so that the total power is 0 dB. When the power is adjusted, the ratios between individual channel power values are maintained.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 1, 2, 3, or 4 > Enter > Adjust Code Domain Power > Scale To 0dB**

Or: **Mode > CDMA > CDMA2000 > Link Control > 2 Box Setup > Scale To 0dB**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 1, 2, 3, or 4 > Enter > Adjust Code Domain Power > Scale To 0dB**

Or: **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup > Scale To 0dB**

### Seed

This key accesses a menu from which you can set the initial value of the pseudorandom bit sequence.

Range:

PN9 Seed: 000 through 1FF

PN15 Seed: 0000 through 7FFE

Default:

PN9 Seed: 000

PN15 Seed: 0000

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-SCH, F-FCH, or F-PCH > Channel Setup > Data > Edit Item > User File > Edit File or Edit File > Insert PN9 or Insert PN15 > Seed**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File > Edit File or Edit File > Insert PN9 or Insert PN15 > Seed**

## Select

This key accesses a menu from which you can select a filter type. You can select from standard filter types, such as Nyquist and Gaussian, as well as the User FIR Menu, which lists the catalog of user-defined FIR files.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select**

## Select File

This key selects a file in the displayed catalog of binary/bit files. **Select File** key is located in the catalogs of files.

## SID

This field displays the current system identification value. To change the SID, press the **Edit Item** softkey and enter a new value.

Range: 0000 through 7FFF hexadecimal

Default: 0007

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > SID**

## Spread Rate

This field displays the current spread rate value. The grayed-out text in this field indicates that you cannot change the value.

Default: 1

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Spread Rate**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Spread Rate**

## Store To File

This key accesses a menu from which you can name the file to be stored in the catalog of files.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load/Store > Store To File**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load/Store > Store To File**

## Symbol Sync Out

This key accesses a menu from which you can modify the output of the SYMBOL SYNC OUT rear panel BNC/SMB connector in reverse link mode. Items selected from the accessed menu may change when switching between radio configuration 1 or 2 and radio configuration 3 or 4.

Default: Even Second

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Symbol Sync Out**

## SYS\_Time

This field displays the current system time value in hexadecimal. To change the system time, press the **Edit Item** softkey and enter a new value.

Range: 000000000 through FFFFFFFF

Default: 000000000

Data Field Location: **Mode > CDMA > CDMA2000 > Link Control > 2 > Enter > Channel Setup > SYS\_Time**

---

## T

### Tail Bits

This field displays the current tail bits value (hexidecimal). The grayed-out text in this field indicates that you cannot change the value.

Default: 00

Data Field Location: **Mode** > **CDMA** > **CDMA2000** > **Link Control** > **3** or **4** > **Enter** > **Channel Type** > **F-FCH** or **F-SCH** > **Channel Setup** > Tail Bits

### Trigger Advance

This field displays the current number of chips that the trigger is advanced. The trigger advance is referenced to the ESG even second clock and is used to synchronize the ESG with the base station. The base station's timing signal is input at the PATTERN TRG IN rear panel BNC/SMB connector.

---

#### NOTE

Changing the trigger advance value may cause the signal generator to lose synchronization with the base station signal.

Range: 0 through 2455999

Default: 18

Data Field Location: **Mode** > **CDMA** > **CDMA2000** > **Link Forward Reverse** > **Mobile Setup** > Trigger Advance

### Trigger Edge

This field indicates whether the ESG will trigger on the rising or the falling edge of the base station trigger signal. To change the trigger edge selection, press **Edit Item** and then press either the **Falling** or the **Rising** softkey.

Default: Falling

Data Field Location: **Mode** > **CDMA** > **CDMA2000** > **Link Forward Reverse** > **Mobile Setup** > Trigger Edge

### Turbo Coding

This field indicates whether turbo coding is turned off or on. To change the status, press the **Edit Item** softkey and then toggle the **Turbo Coding Off On** softkey to the desired state.

Default: Off

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2 or 4 > Enter > Channel Type > F-SCH > Channel Setup > Turbo Coding**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2 or 4 > Enter > Channel Type > R-SCH > Channel Setup > Turbo Coding**

## Turbo Coding Off On

This key toggles the turbo coding operating state off or on and is used in both forward and reverse link.

Turbo coding is valid for forward supplemental channels with a radio configuration of 3, 4, or 5 and can only be used with the following data rates:

RC 3: 19.2, 38.4, or 76.8 kbps

RC 4: 19.2, 38.4, 76.8, or 153.6 kbps

RC 5: 28.8, 57.6, or 115.2 kbps

Turbo coding is valid for reverse supplemental channels with a radio configuration of 3 or 4 and is constrained by frame lengths and data rates. The following list shows the frame lengths and data rate settings that are applicable with turbo coding:

RC 3 (20ms frame length): 19.2, 38.4, 76.8, or 153.6 kbps

RC 3 (40ms frame length): 9.6, 19.2, 38.4, 76.8, or 153.6 kbps

RC 3 (80ms frame length): 4.8, 9.6, 19.2, 38.4, or 76.8 kbps

RC 4 (20ms frame length): 28.8, 57.6, or 115.2 kbps

RC 4 (40ms frame length): 14.4, 28.8, 57.6, or 115.2 kbps

RC 4 (80ms frame length): 7.2, 14.4, 28.8, or 57.6 kbps

Default: Off

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2 or 4 > Enter > Channel Type > F-SCH > Channel Setup > Turbo Coding > Edit Item > Turbo Coding Off On**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2 or 4 > Enter > Channel Type > R-SCH > Channel Setup > Turbo Coding > Edit Item > Turbo Coding Off On**

---

## U

### User File

This key accesses a menu from which you can select a user-defined file to be used as a data bit pattern.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 2, 3, or 4 > Enter > Channel Type > F-FCH or F-SCH > Channel Setup > Data > Edit Item > User File**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 2, 3, or 4 > Enter > Channel Type > R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Data > Edit Item > User File**

Softkey Location (for Reverse RC 1 & RC 2): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Radio Config > 1 or 2 > Enter > Return > Link Control > Channel Type > R-ACH, R-FCH, or R-SCH > Channel Setup > Data > Edit Item > User File**

### User FIR

This key accesses a menu from which you can select a user-defined FIR file.

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Select > User FIR**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Select > User FIR**

---

## V

### Voltage This ESG

This field displays the total voltage of the active channels in this ESG and is used when configuring a two-ESG system. Enter this value in the Voltage Other ESG data field of the ESG that is paired with this ESG. See [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15.

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > 2 Box Setup > Voltage This ESG**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup > Voltage This ESG**

### Voltage Other ESG

This field is used when configuring a two-ESG system. Edit this field to enter the total voltage value of the paired ESG after setting the channel powers of both ESGs. The entered value enables the scale to 0 dB function to align the channel voltages between the signal generators. The IQ voltage scale will automatically be generated once this value has been entered. See [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15.

---

#### NOTE

For the single ESG setup, this field needs to be 0.0 V.

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > 2 Box Setup > Voltage Other ESG**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > 2 Box Setup > Voltage Other ESG**



## W

### Walsh

This field displays the current Walsh code (orthogonal code) values that are assigned uniquely to each user in a cell. Walsh code ranges are dependent on channel type, radio configuration, data rates and frame length.

To change the Walsh code, press the **Edit Item** softkey and enter a new value. If the text is grayed-out in this field, you cannot change the value.

The R-SCH for RC1 and RC2 does not have a Walsh code value.

#### NOTE

When selecting a Walsh code for the R-SCH, you need to ensure it is compatible with the data rate being used. Due to the flexibility built into the ESG, it is possible to set a Walsh code with a data rate that is not within IS-2000 specifications.

#### Ranges:

Channel Type	Radio Configuration	Walsh Code	Bit Rate (kbps)	Frame Length (ms)
<b>Forward Link</b>				
F-PICH		0		
F-SYNCH		0 - 63		
F-FCH		0 - 63		
OCNS		0 - 63		
F-PCH		0 - 63		
F-SCH	3	0 - 31	≤ 19.2	
		0 - 15	38.4	
		0 - 7	76.8	
		0 - 3	153.6	
	4	0 - 63	≤ 19.2	
		0 - 31	38.4	
		0 - 15	76.8	
		0 - 7	153.6	
		0 - 3	307.2	
	5	0 - 31	≤ 28.8	
		0 - 15	57.6	
		0 - 7	115.2	
0 - 3		230.4		
QPCH		1 - 127		

Channel Type	Radio Configuration	Walsh Code	Bit Rate (kbps)	Frame Length (ms)		
<b>Reverse Link</b>						
R-PICH		0				
R-DCCH	3	0 - 15	9.6	5 or 20		
	4	0 - 15	14.4	20		
R-EACH	3 - 4	0 - 7	9.6	20		
			19.2	20 or 10		
			38.4	20, 10, or 5		
R-FCH	3	0 - 15	1.5	20		
			2.7			
			4.8			
			9.6		20 or 5	
	4	0 - 15	1.8	20		
			3.6			
			7.2			
			14.4			
R-SCH	3	0 - 7	1.2	80		
			1.35	40		
			1.5	20		
			2.4	80 or 40		
			2.7	20		
			4.8	80, 40, or 20		
			9.6	80, 40, or 20		
			19.2	80, 40, or 20		
			38.4	80, 40, or 20		
			76.8	80, 40, or 20		
	153.6		80, 40, or 20			
	307.2		20			
	4			1.8	80, 40, or 20	
				3.6	80, 40, or 20	
				7.2	80, 40, or 20	
				14.4	80, 40, or 20	
				28.8	80, 40, or 20	
				57.6	80, 40, or 20	
				115.2	40 or 20	
				230.4	20	
RCCCH		3 - 4		0 - 7	9.6	20
					19.2	20 or 10
	38.4		20, 10, or 5			

Defaults:

Channel Type	Radio Configuration	Walsh Code	Bit Rate (kbps)	Frame Length (ms)
<b>Forward Link</b>				
F-PICH		0		
F-SYNCH		32	1.2	20
F-FCH	1	10	9.6	20
OCNS		61		
F-PCH		1	9.6	20
F-SCH	3	12	19.2	20
F-SCH	4	14	19.2	20
F-SCH	5	14	28.8	20
QPCH		80	4.8	20
<b>Reverse Link</b>				
R-PICH		0		
R-DCCH	3	8	9.6	20
R-DCCH	4	8	14.4	20
R-FCH	3	4	9.6	20
R-FCH	4	4	14.4	20
R-SCH	3	2	9.6	20
R-SCH	4	2	14.4	20
R-CCCH	3 - 4	2	38.4	20
R-EACH	3 - 4	2	38.4	20

Data Field Location (Forward): **Mode > CDMA > CDMA2000 > Link Control > 1, 2, 3, or 4 > Enter > Channel Setup > Channel Type > F-PICH, F-FCH, F-SCH, F-SYNCH, F-PCH, or QPCH > Walsh**

Data Field Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Link Control > 1, 2, 3, or 4 > Enter > Channel Type > R-PICH, R-DCCH, R-FCH, R-SCH, R-EACH, or R-CCCH > Channel Setup > Walsh**

## Window

This key accesses a menu from which you can apply a windowing function to the selected filter. The default is to use no windowing which optimizes the passband response (EVM). Several windowing selections are provided in this menu to smooth the filter's transition to zero. Windowing improves adjacent channel power performance (ACP) but simultaneously degrades EVM.

Default: None

Softkey Location (Forward): **Mode > CDMA > CDMA2000 > BTS Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist or Nyquist > Gaussian or Rectangle > Window**

Softkey Location (Reverse): **Mode > CDMA > CDMA2000 > Link Forward Reverse > Mobile Setup > Filter > Edit Item > Define User FIR > Load Default FIR > Root Nyquist or Nyquist > Gaussian or Rectangle > Window**

---

## Z

### Zi

This key selects the in-phase portion of the reverse fundamental channel as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Zi**

### Zq

This key selects the quadrature portion of the reverse fundamental channel as the output at the DATA OUT rear panel BNC/SMB connector. Reverse link radio configuration 3 or 4 is required.

Softkey Location: **Mode > CDMA > CDMA2000 > Link Forward Reverse > BNC MUX Settings > Data Out > Zq**

## 4 Operation

This chapter contains detailed information that will help you understand the operation of your Option 201 signal generator(s).

The chapter is divided into the following sections:

- [“Understanding the Single-ESG Configuration”](#) on page 4-2
- [“Understanding the Two-ESG System Configuration”](#) on page 4-3
- [“Forward and Reverse Link Channel Structures”](#) on page 4-6
- [“Forward and Reverse Link I/O Signal Descriptions and Timing Relationships”](#) on page 4-9
- [“Forward and Reverse Link Relative Power Mapping”](#) on page 4-16
- [“Understanding the Forward Paging Channel”](#) on page 4-17
- [“Option 201 Operational Characteristics”](#) on page 4-19

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## Understanding the Single-ESG Configuration

The Option 201 single-ESG configuration provides IS-95 receiver design testing in forward and reverse link and IS-2000 receiver designs in reverse link.

This configuration utilizes internal I/Q triggering. The rear panel EVENT 1 BNC/SMB connector provides an even second clock with adjustable delay. The even second output provides a pulse every two seconds and can be used to synchronize other instruments in the test system. The even second delay can be adjusted to align the frame timing with the RF output.

### Forward Link Capabilities

The Option 201 forward link, single-ESG setup is used for testing IS-95 compatible receiver designs. It provides four IS-95 backwards compatible channels with real-time generation capability. In addition to providing IS-95 compatibility, a partial IS-2000 signal can be transmitted using up to four IS-2000 channels. The single-ESG setup provides the following forward link channel types: pilot, sync, paging, supplemental (RC3–5), and OCNS (optional) or RC1 (or RC2) fundamental traffic channels. The RC1 and RC2 traffic channels are IS-95 backwards compatible.

### Reverse Link Capabilities

The Option 201 reverse link, single-ESG setup provides IS-95 backwards compatibility in RC1 and RC2. These radio configurations provide a single selectable channel type: R-ACH, R-FCH, or R-SCH. Within these radio configurations, you can perform tests by sending short signaling messages, simulating response to pages, and sending data using the fundamental or supplemental traffic channels.

IS-2000 testing is accomplished using RC3 and RC4. These radio configurations allow fully coded signals with up to four channels consisting of the following types: R-PICH, R-DCCH, R-FCH, R-SCH, R-CCCH, and R-EACH. The R-PICH allows adjustable gating and power control bit (PCB) puncturing. The traffic channels provide frame length and offset adjustments, incremental data rates and selectable Walsh codes.

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## Understanding the Two-ESG System Configuration

The Option 201 two-ESG configuration allows for more complex signal transmission in both the forward and reverse links for testing IS-2000 receiver designs. The two-ESG configurations require that both sources route the I/Q signals through the rear panel BNC/SMB outputs into the ESG 1 front panel I/Q inputs where ESG 1 combines the signals from the two sources. This system configuration uses ESG 2 as an external data clock for ESG 1 and ESG 2. Because the two sources are unable to communicate with one another, there is a power mapping process that must be performed in order for the combined signals to be transmitted at the proper code domain power level (refer to [“Forward and Reverse Link Relative Power Mapping”](#) on page 4-16 for more information).

### Converting a Two-ESG System to a Single-ESG Configuration

Due to the power mapping requirements of a two-ESG system, the conversion from a two-ESG to a single-ESG configuration requires that you preset the ESG to factory-defined settings. This will ensure that the values previously entered in the power mapping process, are reset to zero. Failure to preset the ESG may result in inaccurate code domain power levels while trying to use the single-ESG configuration. Refer to Chapter 2, “Using Functions,” for information on configuring a single ESG.

### Forward Link Capabilities

In addition to providing up to five IS-95 channels, the forward link two-ESG system configuration provides an IS-2000 solution in situations where more real-time CDMA channels, power levels, or higher radio configurations are required. The two-ESG setup provides the following forward link channel types: pilot, sync, paging, OCNS (optional), RC1–5 fundamental and RC3–5 supplemental traffic channels.

The Option 201 forward link has the ability to transmit IS-95 (RC1–2) and IS-2000 (RC3–5) traffic channels simultaneously. However, this may cause a `Code Power Err` message to appear. When this error is displayed, I/Q distortion may be present on the transmitted signal. Because of this, transmitting IS-95 and IS-2000 channels simultaneously is not recommended.

### Generating a Third Forward Link RC3, RC4, or RC5 Traffic Channel

For situations where the resulting power deviation is not a concern, Option 201 also supports the capability for a third RC3, RC4, or RC5 traffic channel (with some limitations) provided by the baseband generator in ESG 2.

On ESG 2, the channel 3 or 4 F-SCH may be selected as the second supplemental traffic channel. However, if three RC3, RC4 or RC5 traffic channels are selected, a `Code Power Err` message will appear on the ESG display. This is because the number of points required for I/Q mapping exceeds the number of points available and some I/Q distortion may be present. This will result in some symbols having errors associated with them and the code domain will exhibit some artifacts. The following section, [“Forward Link I/Q Map Rotation,”](#) explains how to compensate for this condition when three traffic channels are used.



## Forward Link I/Q Map Rotation

In situations where `Code Power Err` appears, while generating a third traffic channel, the ESG allows a 45 degree rotation of the I/Q map to alleviate this error. Rotating the I/Q map on both ESG 1 and ESG 2 allows the generation of three RC3, RC4, or RC5 traffic channels on ESG 2.

While using rotated I/Q maps, only two channels can be generated on ESG 1. For example, a forward link pilot channel and a forward link sync channel on ESG 1, and a forward fundamental traffic channel and two forward supplemental traffic channels on ESG 2.

Because both constellations are rotated, they maintain a 45 degree orientation to each other and decoding remains valid.

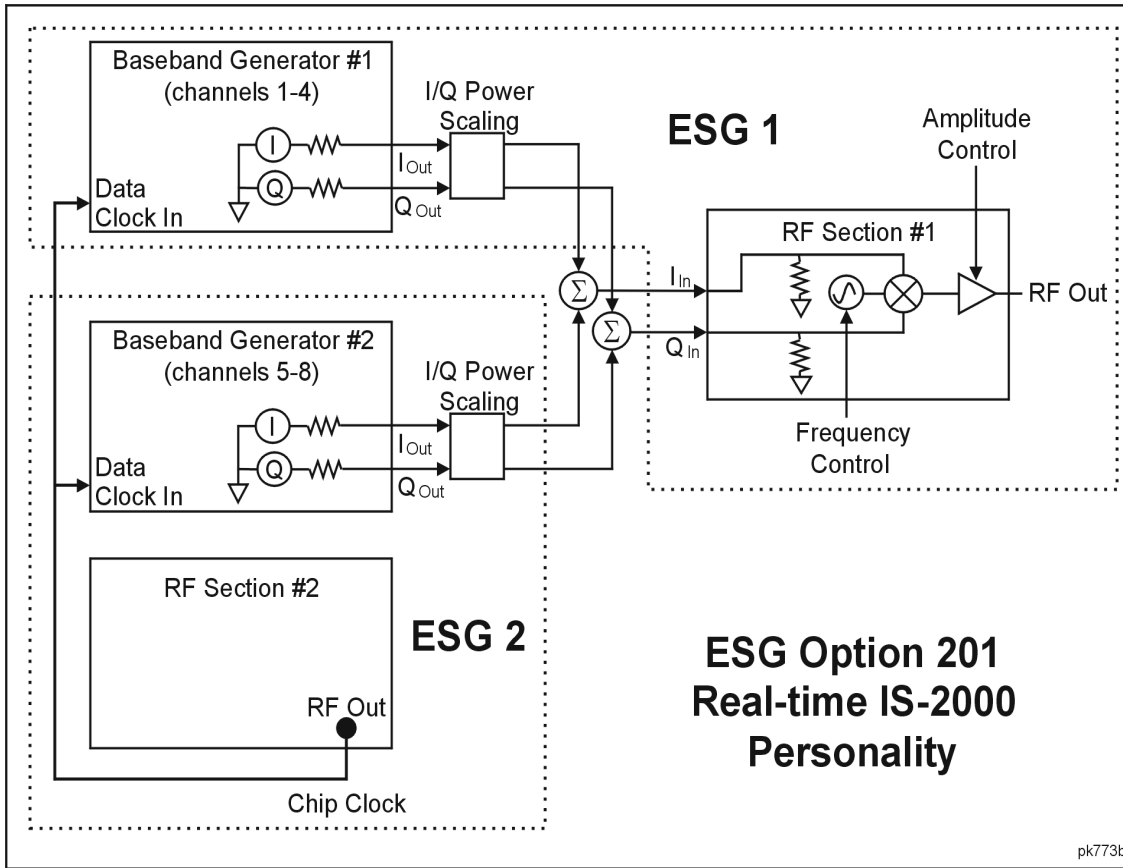
## Reverse Link Capabilities

In addition to having the same capabilities as the single ESG for IS-2000, the Option 201 reverse link two-ESG configuration allows for a fully coded signal to be transmitted with up to five channels, four on ESG 1 and an additional R-SCH on ESG 2. The IS-2000 features of the two-ESG system use RC3 and RC4 which allows for higher data rates and turbo coding. This complex signal structure allows for a more thorough testing of the base station functionality.

## Forward and Reverse Link System Functionality

[Figure 4-1](#) illustrates how the separate sections of the IS-2000 frame are generated by separate baseband generators, one within ESG 1 and another within ESG 2. The two sections of the frame are then combined at the I/Q inputs of ESG 1 and modulated to the carrier by the RF section within ESG 1. After carrier frequency and amplitude are introduced, the IS-2000 signal is output to the DUT through the RF output of ESG 1. The RF section of ESG 2 is utilized to supply the data clock for both baseband generators. (Alternatively, an external function generator, where the reference frequency is locked in with the system, may be used to supply the data clock.)

**Figure 4-1. Block Diagram of the Two-ESG IS-2000 System**



## Forward and Reverse Link Channel Structures

The following subsections list the channel structures that are supported on the ESG(s). The structures should be implemented as shown in the tables.

### Forward Link Supported Channel Structures

**Table 4-1. IS-95 Forward Link Supported Channel Structures**

IS-95 Compatible Channels			
Channel 1	Channel 2	Channel 3	Channel 4
F-PICH			
F-PICH	F-SYNCH		
F-PICH		F-FCH (RC1-2)	
F-PICH			F-PCH
F-PICH	F-SYNCH	F-FCH (RC1-2)	
F-PICH	F-SYNCH		F-PCH
F-PICH	F-SYNCH	F-FCH (RC1-2)	F-PCH
F-PICH	F-SYNCH	OCNS	F-PCH

**Table 4-2. IS-2000 Forward Link Supported Channel Structures**

ESG 1				ESG 2			
Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4
F-PICH							
F-PICH	F-SYNCH						
F-PICH		F-FCH (RC3-5)					
F-PICH			F-PCH				
F-PICH	F-SYNCH	F-FCH (RC3-5)					
F-PICH	F-SYNCH		F-PCH				
F-PICH	F-SYNCH	F-FCH (RC3-5)	F-PCH				
F-PICH			QPCH				
F-PICH	F-SYNCH		QPCH				
F-PICH	F-SYNCH	OCNS	F-PCH			F-FCH (RC3-5)	
F-PICH	F-SYNCH	OCNS	F-PCH		F-SCH (RC3-5)	F-FCH (RC3-5) <sup>1</sup>	
F-PICH	F-SYNCH	OCNS	F-PCH			F-FCH (RC3-5) <sup>1</sup>	F-SCH (RC3-5)
F-PICH	F-SYNCH	OCNS	F-PCH		F-SCH (RC3-5)	F-FCH (RC3-5) <sup>1</sup>	F-SCH (RC3-5) <sup>2</sup>

1. Using IS-95 backwards compatible traffic channels (RC1-2) with IS-2000 traffic channels (RC3-5) may generate an error message (Code Power Err) and cause I/Q distortion.
2. Use of an additional supplemental channel on ESG 2 to generate a third traffic channel, may cause I/Q distortion. Refer to [“Generating a Third Forward Link RC3, RC4, or RC5 Traffic Channel”](#) on page 4-3 for detailed information.

## Reverse Link Supported Channel Structures

**Table 4-3. RC1 and RC2 Reverse Link Supported Channel Structure**

Channel 1
R-FCH
R-ACH
R-SCH

**Table 4-4. RC3 and RC4 Reverse Link Supported Channel Structures**

ESG 1				ESG 2			
Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4
R-PICH <sup>1</sup>							
R-PICH	R-DCCH						
R-PICH		F-FCH					
R-PICH	R-DCCH	F-FCH					
R-PICH		F-FCH	R-SCH <sub>0</sub>				
R-PICH	R-DCCH	F-FCH	R-SCH <sub>0</sub>				
R-PICH	R-DCCH	F-FCH	R-SCH <sub>0</sub>		R-SCH <sub>1</sub>		
R-PICH <sup>1</sup>			R-EACH				
R-PICH <sup>1</sup>			R-CCCH				

1. These are the only channel structures that allow quarter- and half-gating.

---

## Forward and Reverse Link I/O Signal Descriptions and Timing Relationships

The following subsections describe the functionality and timing relationships of various BNC/SMB I/O connectors for forward and reverse link on the Option 201 signal generator. Option 201 changes some of the standard characteristics of the signals normally used on some of the BNC/SMB I/O connectors. This is done for IS-2000 applications. Some output connectors have additional output signal selections, which are stated within the descriptions. For a description of the additional output capabilities, refer to [Chapter 3](#), “Softkey Reference.”

Connector descriptions are divided into three subsections: front panel BNC/SMB inputs, rear panel BNC/SMB inputs, and rear panel BNC/SMB outputs.

Diagrams are provided on [page 4-13](#), [page 4-14](#), and [page 4-15](#) that show the timing relationship between rear panel BNC/SMB inputs and outputs.

### Front Panel BNC/SMB Inputs

#### DATA (Forward Link)

This connector is used for data input.

The external data input can only be used by F-FCH or F-SCH channels. If these two channel types are assigned external data, the same data is input to both the F-FCH and F-SCH channels. Both channel types must be assigned radio configurations with the same modulation symbol rate.

The serial data must be input at the modulation symbol rate and aligned with the internal F-FCH (or F-SCH) modulation symbol clock. Coded and framed data must be aligned with internal frame timing.

For RC1 and RC2 channel types, the symbol data input timing aligns with internal frame timing. For RC3–5, the I/Q symbol pair, for a given frame position, must input two I/Q symbol pair periods before that frame position. The I and Q symbol data is sampled at the end of the symbol period and must be stable.

The external data is input at the modulation symbol node and is spread with the decimated long code. Subsequently, power control symbol puncturing (for F-FCH channel types only), Walsh coding, and I/Q mapping are applied.

Serial data clock and frame timing can be generated from the chip clock and even second outputs. See the following section, “Rear Panel BNC/SMB Outputs.”

#### DATA CLOCK (Forward and Reverse Link)

This connector is used for a chip clock input.

This input is used for the external reference input (generally a 1.2288 MHz TTL or CMOS signal) for data and baseband generation. This input is active only after toggling the baseband data generator clock from internal to external.

## **Rear Panel BNC/SMB Inputs**

### **ALT PWR IN (Forward Link)**

This connector is used for a Long Code State Latch strobe input.

The leading edge of the long code state latch strobe input is latched and sampled by the chip clock. The current state of the long code is latched and held until the next trigger input. Subsequently, the long code state held in the latch can be read via the GPIB or RS-232 ports.

### **BURST GATE IN (Forward and Reverse Link)**

This connector is used for an even second synchronization input.

The even second signal is used for frame and long code alignment between the two signal generators, ESG 1 and ESG 2. If the even second input edge from the second signal generator (ESG 2) does not align with the internal even second of ESG 1, the frame timing and long code state are reset. The burst gate input is edge-sensitive. It can be left high or low without causing a system reset.

### **PATTERN TRIG IN (Forward and Reverse Link)**

This connector is used for a system reset trigger input.

This system reset trigger ensures frame and long code timing alignment. The reset trigger is used to align ESG 2 with ESG 1 in a two-ESG configuration. In addition, the trigger is used to align a reverse link configuration with the base station. Any change in the state of ESG 1 requiring a reset of long code and channel frame timing, will generate a system reset trigger at the ESG 2 rear panel PATTERN TRIG IN and re-synchronize the signal generators. When the ESG(s) is being used as a mobile station, the reset signal is provided by the BTS via the PATTERN TRIG IN connector on the single ESG or ESG 1 in the two-ESG configuration.

## Rear Panel BNC/SMB Outputs

### DATA OUT (Forward Link)

This connector is used for the power control group bit state output. It has an additional output capability through the softkey menus.

The state of the power control bit (used for power control puncturing during the current power control group) is output on this BNC/SMB connector. The output is aligned with data generation timing and leads the baseband and RF outputs by approximately 17 chips (even second delay). This output can be used to synchronize receiver measurements of mobile power output.

There is one other output signal selection for this connector which is a delayed 80 ms trigger.

### DATA OUT (Reverse Link)

This connector is used for the long code output. It has additional output capabilities through the softkey menus.

This connector provides an external output for the current long code being processed. The beginning of the long code occurs two chips after a system reset, leads the SYMBOL SYNC OUT signal by 257 chips in RC1–2 and 1 chip in RC3–4, and leads the delayed even second signal by approximately 17 chips (even second delay). The long code rear panel output occurs prior to the RF output.

The other selections for this connector allow the output of channel coded data for most types of channels, and the in-phase or quadrature portion of the fundamental channel.

### DATA CLK OUT (Forward Link and Reverse Link)

This connector provides an external output for the chip clock. For reverse link, it has an additional output capability through the softkey menus.

The chip clock provides a 1.2288 MHz TTL signal with one-chip wide pulses that is used for the timing to determine when events will occur. The BTS timing and the system resync signals both start at the first available rising chip clock pulse edge. All other signal start times are counted using the chip clock pulses relative to the first pulse occurrence of the timing or resync signal. The trigger advance, even second delay, and the other internal leading chips, relative to the delayed even second signal, are counted using the one-chip wide chip clock pulse.

In reverse link, there are other selectable clock rates, 1 group for RC1–2 and another for RC3–4.



### **EVENT 1 (Forward and Reverse Link)**

This connector is used for the delayed even second output. It has additional output capabilities through the softkey menus.

This connector provides a one-chip wide signal output with variable delay from the internal data generation even second. The delay is adjustable (via the front panel user interface or remote interface, *Even Sec Delay*) to allow even second alignment with baseband and RF outputs. Data generation timing leads the baseband and RF outputs by approximately 17 chips (even second delay).

In forward link, there are two other trigger signals available, a delayed 20 and 80ms signal.

For reverse link, there is one other softkey selection for the output which is PN Sync. The PN Sync is a signal that indicates the start of the short code.

### **EVENT 2 (Forward Link)**

This connector is used for the system reset output.

The system reset trigger outputs whenever a PN offset value changes or differences in frame and long code timing alignment are apparent between the signal generators. Any change in the state of ESG 1 PN offset value (or other change requiring a reset of long code and channel frame timing) will generate a chip-wide system reset trigger output at the ESG 1 rear panel EVENT 2 OUT.

### **EVENT 2 (Reverse Link)**

This connector is used for the system reset output.

The system reset trigger occurs whenever the input BTS timing signal (PATTERN TRIG IN connector) and the ESG's delayed even second clock are not aligned. In the two-ESG configuration, the BTS timing signal is connected to ESG 1. When the reset occurs, ESG 1 Event 2 connector outputs a reset signal to the ESG 2 PATTERN TRIG IN connector. This ensures that both ESGs align properly with the BTS timing signal.

### **SYMBOL SYNC OUT (Forward and Reverse Link)**

This connector is used for the even second output. For reverse link, it has an additional output capability through the softkey menus.

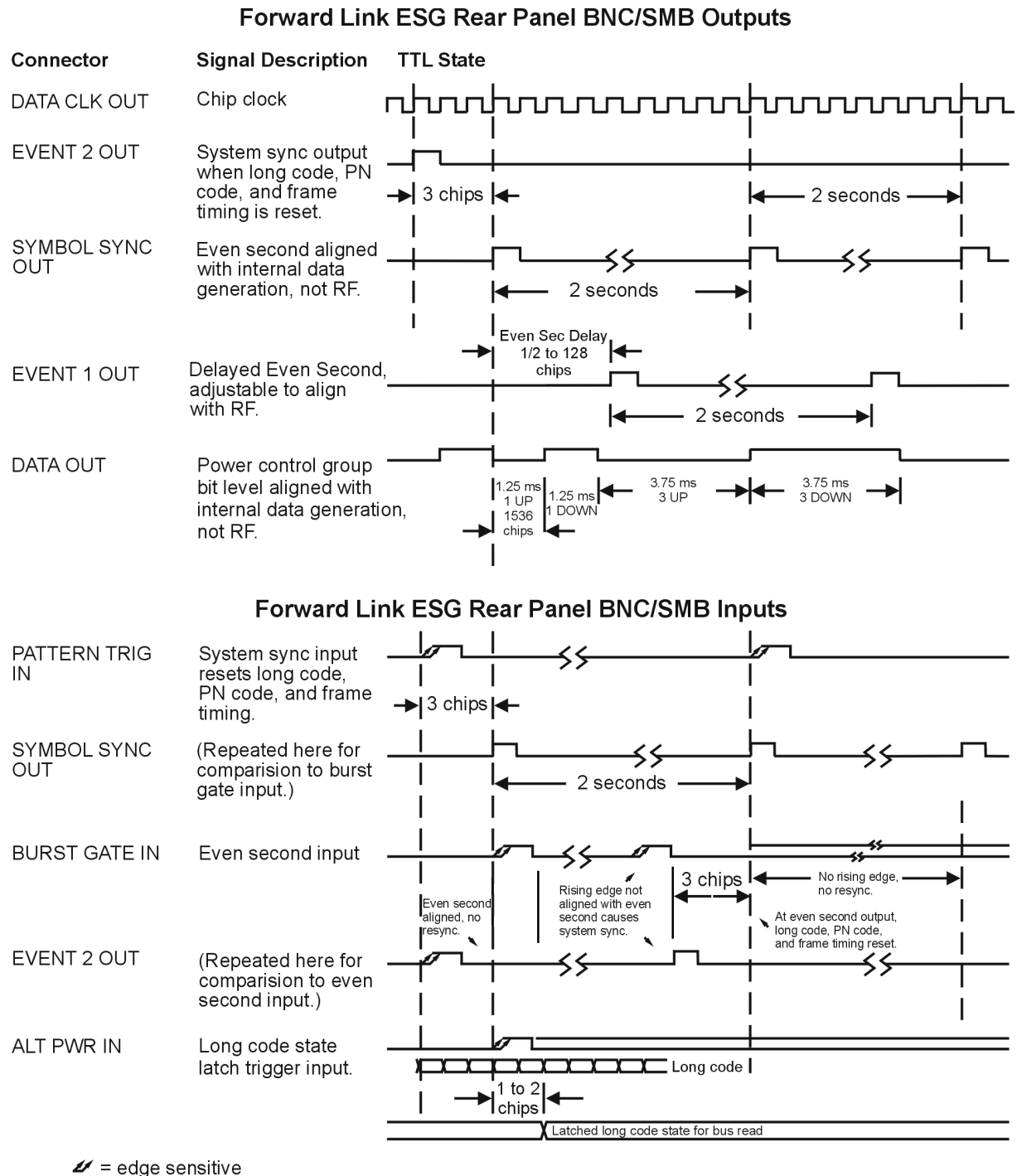
The one-chip-wide even second signal is aligned with the internal data generation timing. It is used for frame and long code alignment between the two signal generators, ESG 1 and ESG 2. If the even second input edge from the ESG 2 does not align with the internal even second from ESG 1, the frame timing and long code state are reset.

In reverse link, there is a **Long Code Sync** selection which provides a trigger to signal the start of the long code.

## Forward Link I/O Timing Relationships

Figure 4-2. illustrates the forward link timing relationships between the signals at the rear panel BNC/SMB output and input connectors. Signal states are referenced to the chip clock provided at the DATA CLK OUT connector.

Figure 4-2. Forward Link Timing Diagram

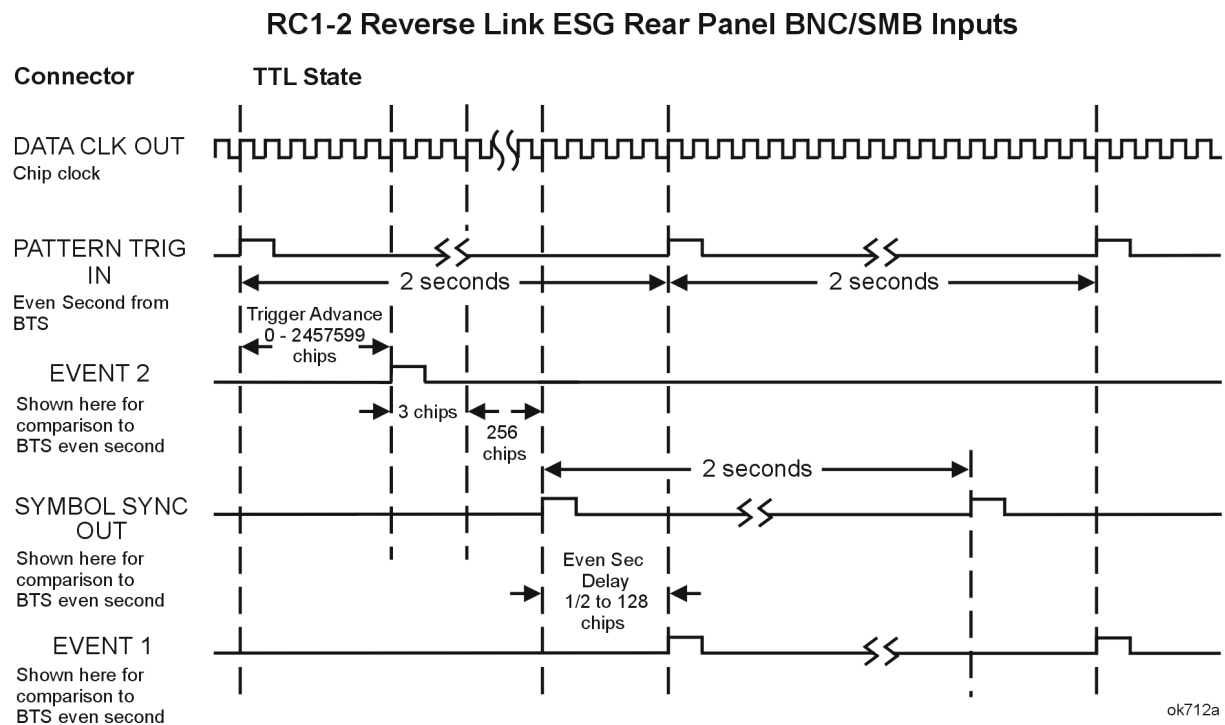
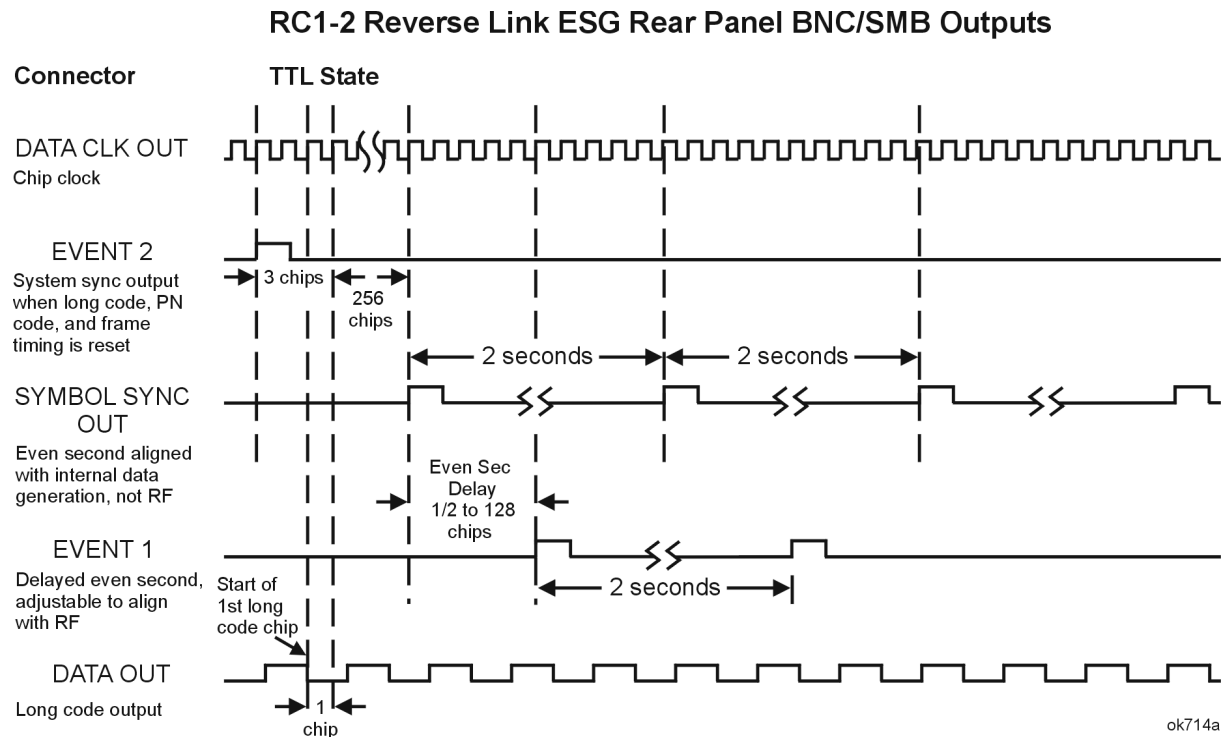


ok711a

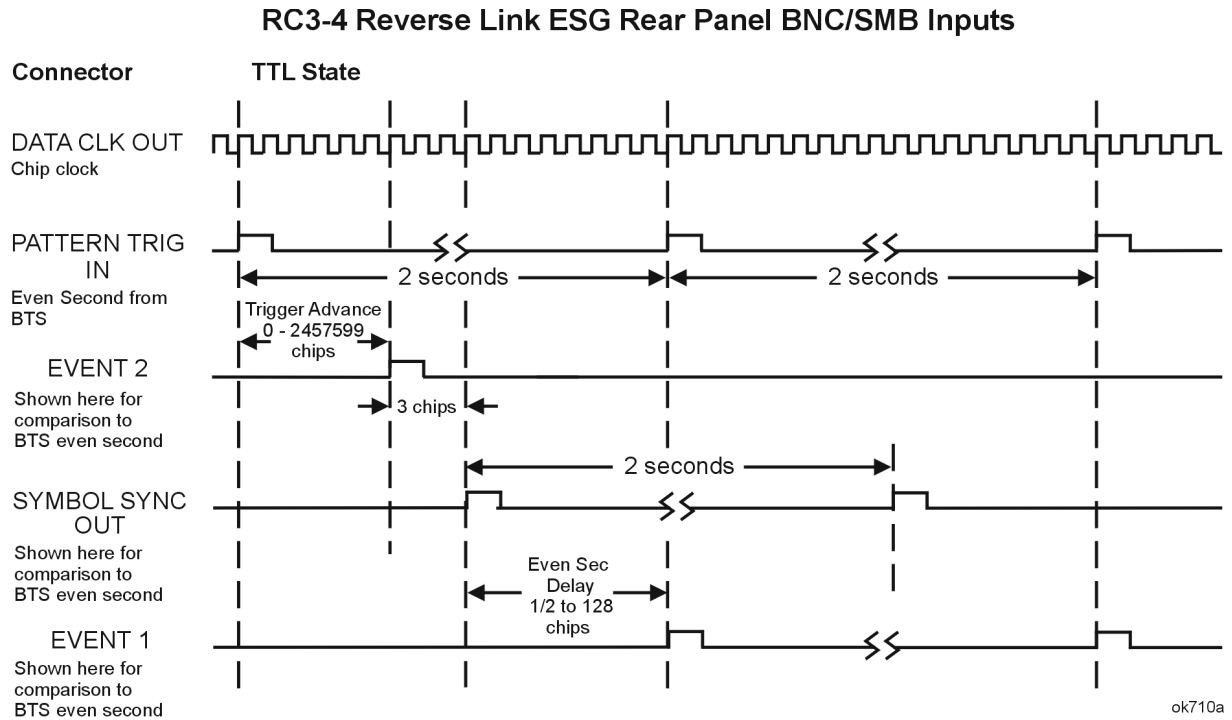
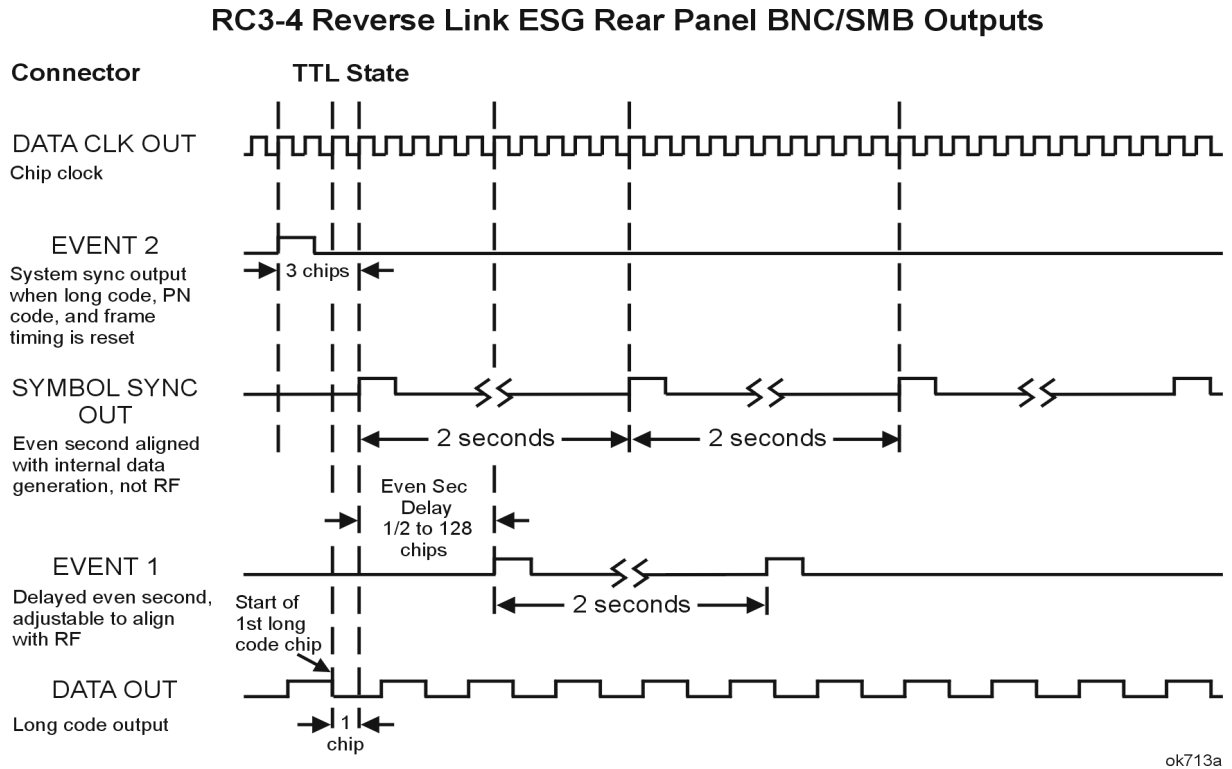
## Reverse Link I/O Timing Relationships

Reverse link has two different timing diagrams, one for RC1-2 (Figure 4-3.) and another for RC3-4 (Figure 4-4.). Both diagrams illustrate the timing relationships between the signals at the rear panel BNC/SMB output and input connectors. Signal states are referenced to the chip clock provided at the DATA CLK OUT connector.

**Figure 4-3. Reverse Link I/O Timing Diagram for RC1-2**



**Figure 4-4. Reverse Link I/O Timing Diagram for RC3-4**



---

## Forward and Reverse Link Relative Power Mapping

The Option 201 two-ESG system configuration, used in the forward and reverse modes, require adjustments to the code domain power of each active channel in order to achieve the expected IS-2000 code domain power output.

Once a test system has been properly connected and configured, a power mapping procedure must be performed to ensure accurate code domain power levels. This procedure is the same for both forward and reverse link.

ESG 1 and ESG 2 cannot communicate channel power level information between the two signal generators. The Relative Power Mapping Procedure solves this problem.

This procedure ensures that the individual channel power levels generated on ESG 1 are aligned with the channel power levels produced by ESG 2 to achieve the expected IS-2000 code domain power levels.

By making adjustments to percent power paired and total voltage paired, the power output of the second baseband generator is matched to the first, resulting in a 0 dB overall system code domain output power value.

Voltage Other ESG values and % Power Other ESG values must be input to ESG 1 and ESG 2 via the front panel user interface or by executing SCPI commands via remote interface. See [“Adjust the Relative Power Mapping \(Two-ESG Forward Link\)”](#) on page 2-15.

---

**NOTE** To ensure accuracy, the Relative Power Mapping Procedure must be repeated everytime a channel power level setting is modified on either ESG.

---

In the forward link mode, there is an OCNS that generates orthogonal noise in the code domain. If specific forward link channel power levels are required, adjusting the power level of orthogonal noise is an easy way to add fill-in power in order to achieve the required code domain power output while keeping the original channel power values intact.

---

## Understanding the Forward Paging Channel

The signal generator can play a paging message file through the forward paging channel (F-PCH), channel 4. The paging file can contain one or more messages with a maximum file length of 512 bytes. The messages are continuously played (synchronous paging messages) whenever the paging channel is active.

You can use the five default paging messages contained in the signal generator's default paging file or a user-defined paging message file.

The default paging message file contains the five messages shown below. These messages are played continuously in consecutive paging slots.

- System parameters message  
msg = 01 06 00 00 1C 00 04 1D  
08 00 09 C0 9F 00 14 F3  
59 99 17 9C 00 44 47 83  
07 1C 81 4C 0
- Access parameters message  
msg = 02 06 00 00 00 4F 40 00  
00 00 02 80 08 80 0
- Neighbor list message  
msg = 03 06 01 80 48 16 81 80  
19 81 B0 1C 81 E0 0
- CDMA channel list message  
msg = 04 06 00 60 0
- General page message  
msg = 11 08 5C 80 0

These default paging file messages can be played manually (see “[Creating a Synchronous Paging Message](#)” on page 2-29) or remotely (see “[F-PCH Data](#)” on page 5-10).

In addition to the default paging file, the signal generator allows a user paging file to be defined. Allowable messages are defined in the IS-95 standard. The user-defined paging file can be 512 bytes (4096 bits) in length.

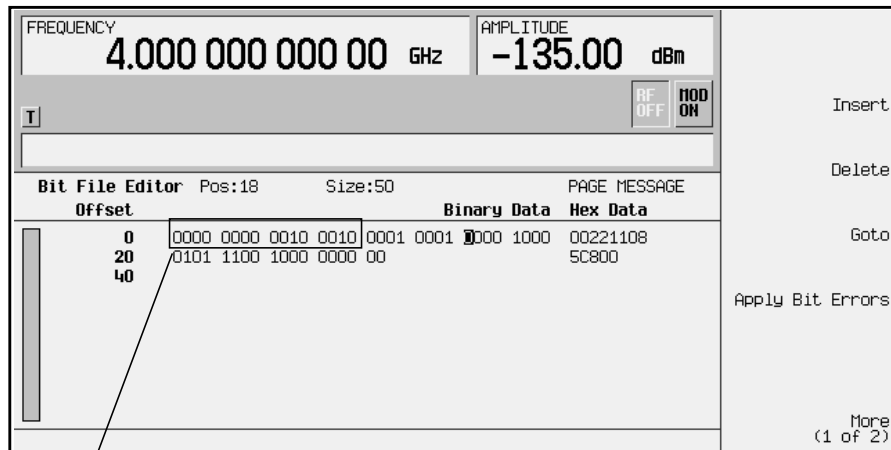
Using a SCPI command, a one-time message (asynchronous paging message) may be inserted into the F-PCH paging stream. When the SCPI command is received, and the current message is completed, the one-time message is inserted into the paging message stream. After the one-time message has played, the paging channel reverts to the original paging file messages. (See “[F-PCH Message](#)” on page 5-11.)

The next section details the paging message format.

## Forward Link User-Defined Paging Messages

Every paging message consists of a header followed by the bit representation of the message. The header portion of the paging message is the message length in bits and is padded to the left with zeros to get the required 16-bit length.

The General page message, shown previously, is used as an example for creating user-defined messages in a paging file. (Refer to TIA/EIA-95-B Section 7-89 for information on the General page message.) The figure below shows the signal generator's paging file editor screen and the bit representation for the General page message. The General page message consists of the 16-bit header followed by the bit representation of the hexadecimal message.



Header

---

**NOTE** The row numbers in the *Offset* field can be used to count the number of bits in the *Binary Data* field. Each row number differs by a hexadecimal value of 20 (32 in decimal). Therefore, each row can have a maximum of 32 bits (8 groups of 4 bits). This information allows you to quickly determine the length of your file.

---

If the General page message is used as a one-time message, it is described as follows:

The header has a hexadecimal value of 22 (0000 0000 0010 0010), which represents the number of bits in the paging message (34 in decimal). The bit value of the General page message is 0001 0001 0000 1000 0101 1100 1000 0000 00. This message can be played as a one-time message using a remote SCPI command (see “[F-PCH Message](#)” on page 5-11). The message format is <bit count>, <datablock>. The following SCPI command will output the General page message.

```
[SOURce]:RADio:CDMA2000:[ :BBG]:FORWard:FPCH:SETup:MESSAge 34,#17 0022
0001 0001 0000 1000 0101 1100 1000 0000 0
```

For more information on the command format and downloading files, see the programming guide, Chapter 3, “Remote Data Transfer.”

---

## Option 201 Operational Characteristics

The following subsections describe some of the unique operational characteristics that may be encountered while you configure the Option 201 signal generator.

### Walsh Codes

This section will explain some of the different characteristics that may apply while entering Walsh code values.

#### Conflicting Walsh Code Values

In both forward and reverse link, the ESG will allow entering the same Walsh code for multiple channels. However, once the channels with the same Walsh codes are turned on, a settings conflict error is generated (error number and type will be shown in the lower left corner of the display). The error text can be viewed by pressing the following keys:

Utility > Error Info

Pressing the **Clear Error Queue(s)** softkey will clear all error messages.

#### Reverse Link R-SCH Walsh Codes and Data Rates

Walsh code, data rate, and frame length values are dependent upon one another. With the flexibility that the ESG allows, it is possible to enter a Walsh code and data rate combination for the R-SCH that is not in accordance with IS-2000 specifications. Using such a combination is not recommended and may cause an increase in the FER.

### R-PICH Gating

R-PICH quarter- or half-gating is only allowed in the following channel configurations:

- R-PICH active
- R-PICH and R-CCCH active
- R-PICH and R-EACH active

### Reverse Link Filters

There are four filters that have or start with the naming convention of IS-95: IS-95, IS-95 w/EQ, IS-95 Mod, and IS-95 Mod w/EQ. All four filters are accessible from the reverse link, CDMA2000 menu by pressing **Mobile Setup > Filter > Edit Item > Select > IS-95 and IS-2000**. Of these four filters, only the following two should be used in reverse link:

- IS-95
- IS-95 Mod

The IS-95 w/EQ and the IS-95 Mod w/EQ filters are used for forward link. Their purpose is to simplify the mobile receiver design for receiving base station transmissions. Using them in reverse link may cause the mobile station signal to be indiscernible.



## Forward and Reverse Link Couplings

Couplings are safeguards/buffer limits that will cause a state or field value to change when an invalid condition occurs. In some instances, a coupling may not allow a current state to change until a certain condition is met. For example, in some fields on the ESG, if an illegal value is entered in one field that violates the IS-2000 specifications for other fields, it may cause the value in the other fields to reset to their default values. Refer to Chapter 3 , “Softkey Reference,” for information on specific fields and softkey default values.

Some of the conditions that cause the couplings to initiate will also generate error messages. When an error message is generated, you will see an error message number and type appear in the lower left corner of the ESG display. To view error messages, press **Utility > Error Info**. If more than one message is available, press the **View Next Error Message** softkey to display the next error message. To clear error messages, press the **Clear Error Queue(s)** softkey.

Couplings for Option 201 are shown in the following lists:

### Applies to Forward and Reverse Links

- The **CDMA2000 Off On** softkey cannot be set to **On** until at least one channel is active.

### Applies to Forward Link

- Radio configuration changes will reset the data rate if it is not applicable to the new radio configuration.
- Turbo coding is turned off if a data rate is entered that is not applicable to this feature.
- The Walsh code for a channel will be reset if an invalid data rate is entered for the same channel.
- Channel three will turn off when the QPCH, on channel four, is turned on (QPCH requires channels 3 and 4 to operate).
- QPCH, on channel four, will turn off if channel three is turned on.

### Applies to Reverse Link

The reverse link couplings are explained in detail in the following list and are summarized in [Table 4-5](#).

- Radio configuration changes will reset the **Frame Length**, **Data Rate** and **Frame Offset** fields to default values for all channel types in the newly selected radio configuration. In addition, the **Turbo Coding** field will be set to **Off**.
- Frame length changes will reset the **Frame Offset** and **Data Rate** fields to default values.
- Turbo coding is turned off if a data rate is entered that is not applicable to this feature.
- When **R-SCH<sub>1</sub>** (channel two) is turned on, channels one, three, and four will turn off.
- If **R-SCH<sub>1</sub>** (channel two) is on and the **R-PICH**, **R-FCH**, or the **R-SCH<sub>0</sub>** is turned on, then the **R-SCH<sub>1</sub>** on channel two will change to the **R-DCCH** and remain on.
- If the **R-CCCH** or the **R-EACH** (channel four) is selected, channels two and three will turn off.

- If the R-CCCH or the R-EACH is on and the R-DCCH or the R-FCH is turned on, channel four will remain on, but the channel type will change to R-SCH<sub>0</sub>.
- R-PCH quarter- and half-gating will reset to full when invalid channels are turned on.

**Table 4-5. Reverse Link Couplings**

Coupling Affects	Action Performed to Initiate Coupling							
	RC Change	Frame Length Change	Data Rate Change	R-DCCH, R-FCH, or R-SCH <sub>0</sub> on	R-SCH <sub>1</sub> (Ch 2) on	R-PICH, R-FCH, or R-SCH <sub>0</sub> on	R-CCCH or R-EACH on	R-DCCH or R-FCH on
Frame Length	•							
Frame Offset	•	•						
Data Rate	•	•						
Turbo coding	•		•					
R-PCH Gating				•				
Channels 1, 3, and 4					•			
R-SCH <sub>1</sub> (Ch 2)				•		•		
Channels 2 and 3							•	
R-CCCH or R-EACH								•

### Shared Forward and Reverse Link Parameters

Shared parameters are values or settings that are valid in both forward and reverse link. For example, if the value for the Even Sec Delay field on the ESG is changed in forward link, this new value will also be valid when the user changes to reverse link (this assumes that the **Preset** softkey has not been used when changing between links).

The following is the list of shared parameters:

- Even Sec Delay data field
- Chip Rate data field
- **BBG Data Clock Ext Int** softkey
- **Phase Polarity Normal Invert** softkey

## 5 Remote Programming and Examples

This chapter describes Option 201 SCPI commands and provides programming examples. The descriptions of commands include syntax requirements, ranges, restrictions, queries, and status at \*RST.

---

## cdma2000 Subsystem SCPI Command Reference

Use the following SCPI commands to remotely set the controls and parameters associated with the cdma2000 communications standard. The commands are listed in alphabetical order by subject.

### Adjust Code Domain Power

Forward:

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :PADJust EQUal | SCALe
```

Reverse:

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :PADJust EQUal | SCALe
```

Execute this command to set the code domain power.

**EQUal** sets the channel power levels so that all channels are of equal power and the total power equals 0 dB.

---

**NOTE** The **EQUal** command is only for a single-ESG configuration.

---

**SCALe** scales all of the current channel powers so that the total power equals 0 dB while maintaining the previous power ratios between the individual channels.

### BBG Data Clock External Internal

Forward:

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :BBCLock INT [ 1 ] | EXT [ 1 ]  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :BBCLock ?
```

Reverse:

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BBCLock INT [ 1 ] | EXT [ 1 ]  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BBCLock ?
```

Execute this command to select the data clock source.

Choices: INT (internal data clock) or EXT (external data clock)

\*RST Value: Internal

## cdma2000 State

```
[ :SOURce]:RADIo:CDMA2000[:BBG][:STATe] ON|OFF|1|0  
[:SOURce]:RADIo:CDMA2000[:BBG][:STATe]?
```

Execute this command to set the operating state of cdma2000.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

## cdma2000 Link

```
[ :SOURce]:RADIo:CDMA2000[:BBG]:LINK FORWARD|REVERSE  
[:SOURce]:RADIo:CDMA2000[:BBG]:LINK?
```

Execute this command to select either forward or reverse link cdma2000.

\*RST Value: Forward

## Chip Rate

Forward:

```
[ :SOURce]:RADIo:CDMA2000[:BBG][:FORWARD]:CRATE <50 cps - 1.3 Mcps>  
[:SOURce]:RADIo:CDMA2000[:BBG][:FORWARD]:CRATE?
```

Reverse:

```
[ :SOURce]:RADIo:CDMA2000[:BBG]:REVERSE:CRATE <50 cps - 1.3 Mcps>  
[:SOURce]:RADIo:CDMA2000[:BBG]:REVERSE:CRATE?
```

Execute this command to adjust the chip rate. The default value (1.228800 Mcps) is in accordance with the IS-2000 specification.

Range: 50 cps through 1.3 Mcps

\*RST Value: 1.228800 Mcps

## Even Second Delay

Forward:

```
[ :SOURce]:RADIo:CDMA2000[:BBG][:FORWARD]:ESDELAY <0.5 - 128.0>  
[:SOURce]:RADIo:CDMA2000[:BBG][:FORWARD]:ESDELAY?
```

Reverse:

```
[ :SOURce]:RADIo:CDMA2000[:BBG]:REVERSE:ESDELAY <0.5 - 128.0>  
[:SOURce]:RADIo:CDMA2000[:BBG]:REVERSE:ESDELAY?
```

Execute this command to modify the even second clock pulse. The even second clock pulse sets the delay to align the RF with the trigger.

Range: 0.5 through 128 cps

\*RST Value: 17.5 cps

## Filter Configuration - Alpha, BbT, Optimization, Type

---

**NOTE** For information regarding user FIR filter creation and downloading, see the ESG Family Signal Generators Programming Guide.

---

### Filter Alpha (for Nyquist or Root Nyquist)

Forward:

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FILTer:ALPHa <0.0 - 1.0>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FILTer:ALPHa?
```

Reverse:

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:ALPHa <0.0 - 1.0>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:ALPHa?
```

Execute this command to change the alpha value on the Nyquist or Root Nyquist filter. This command is effective only after choosing the Root Nyquist (RNYQuist) or Nyquist (NYQuist) filter; it does not effect other types of filters.

Range: 0.000 through 1.000

\*RST Value: 0.220

### Filter BbT (for Gaussian)

Forward:

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FILTer:BBT <0 - 1.0>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FILTer:BBT?
```

Reverse:

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:BBT <0 - 1.0>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:BBT?
```

Execute this command to change the bandwidth-multiplied-by-bit-time filter value. This command is effective only after choosing the Gaussian (GAUSSian) filter; it does not affect other types of filters.

Range: 0.100 through 1.000

\*RST Value: 0.500

## Filter Optimization (for Nyquist or Root Nyquist)

Forward:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER:CHANNEL EVM|ACP  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER:CHANNEL?
```

Reverse:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER:CHANNEL EVM|ACP  
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER:CHANNEL?
```

Execute this command to optimize a filter for minimized error vector magnitude (select EVM) or for minimized adjacent channel power (select ACP).

\*RST Value: EVM

## Filter Type

Forward:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER RNYQUIST|NYQUIST|GAUSSIAN|  
RECTANGLE|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4FM| "<User FIR>"  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER?
```

Reverse:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER RNYQUIST|NYQUIST|GAUSSIAN|  
RECTANGLE|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4FM| "<User FIR>"  
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER?
```

Execute this command to select a filter type. The following filter choices are available:

RNYQUIST	Root Nyquist
NYQUIST	Nyquist
GAUSSIAN	Gaussian
RECTANGLE	Rectangle
IS95	IS-95
IS95_EQ	IS-95 with equalizer
IS95_MOD	IS-95 modified
IS95_MOD_EQ	IS-95 modified with equalizer
AC4FM	APCO 25 C4FM
"User FIR"	User-defined FIR

## Forward cdma2000 Setup

### Data Out

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:BNCMux:DOUT PCRamp|D80Trigger  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:BNCMux:DOUT?
```

Execute this command to set the output of the DATA OUT rear panel BNC/SMB connector.

\*RST Value: PC ramp

### Event 1

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:BNCMux:EVENT  
DESecond|D20Trigger|D80Trigger  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:BNCMux:EVENT?
```

Execute this command to set the output at the EVENT 1 rear panel BNC/SMB connector.

\*RST Value: Delayed Even Second

## Forward Fundamental Channel Setup

### F-FCH Data

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FFCH:SETup:DATA PN9|PN15|FIX4|  
"<file name>"|EXT  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FFCH:SETup:DATA?
```

Execute this command to configure the data field for the forward fundamental channel.  
The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files
EXT	External input data pattern

\*RST Value: PN9



### F-FCH Data Rate

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:  
RATE <RC dependent:1.2, 1.5, 1.8, 2.4, 2.7, 3.6, 4.8, 7.2, 9.6,  
14.4kbps>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:RATE?
```

Execute this command to adjust the data rate for the forward fundamental channel. The choices are the following:

- |   |                           |
|---|---------------------------|
| <b>RC1:</b> 1.2, 2.4, 4.8, or 9.6 kbps  | <b>Default:</b> 9.6 kbps  |
| <b>RC2:</b> 1.8, 3.6, 7.2, or 14.4 kbps | <b>Default:</b> 14.4 kbps |
| <b>RC3:</b> 1.5, 2.7, 4.8, or 9.6 kbps  | <b>Default:</b> 9.6 kbps  |
| <b>RC4:</b> 1.5, 2.7, 4.8, or 9.6 kbps  | <b>Default:</b> 9.6 kbps  |
| <b>RC5:</b> 1.8, 3.6, 7.2, or 14.4 kbps | <b>Default:</b> 14.4 kbps |

\*RST Value: 9.6 kbps (RC3)

### F-FCH FIX4

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:DATA:FIX4 <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:DATA:FIX4?
```

Execute this command to select a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### F-FCH Frame Offset

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:FOFFset <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:FOFFset?
```

Execute this command to set the frame offset value.

Range: 0 through 15

\*RST Value: 0

### F-FCH Long Code Mask ESN

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask:  
ESN <0 - 0xFFFFFFFF>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask:ESN?
```

Execute this command to set the permuted electronic serial number (ESN) for the long code mask. This is used to identify a particular mobile.

Range: 0 through 0xFFFFFFFF

\*RST Value: 0

### **F-FCH Long Code Mask Header**

```
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :LCMask :  
HEADer <0 - 0x3FF>  
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :LCMask :HEADer ?
```

Execute this command to set the header for the long code mask. This is used to identify a particular mobile.

Range: 0 through 0x3FF

\*RST Value: 318 hexadecimal

### **F-FCH Long Code Mask Query**

```
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :LCMask ?
```

Execute this command to output the contents of the long code mask field for the forward fundamental channel.

### **F-FCH Power**

```
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :POWER <0 - -40dB>  
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :POWER ?
```

Execute this command to set the power for the forward fundamental channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### **F-FCH Power Control (Up/Down)**

```
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :PRAMP <1 - 80>  
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :PRAMP ?
```

Execute this command to display the current number of power frame indicators. The signal generator uses the power frame indicators to command the mobile to increase or decrease power. For example, if 4 is the selected value, it will cause the mobile to respond with 4 sequential power increases, then 4 power decreases. This pattern will continue indefinitely.

Range: 1 through 80

\*RST Value: 1

### **F-FCH Power Puncturing State**

```
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :PPUNCTure ON | OFF | 1 | 0  
[ :SOURCE ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :FFCH :SETup :PPUNCTure ?
```

Execute this command to set the power puncturing operating state for the forward fundamental channel.

Choices: ON (1) or OFF (0)

\*RST Value: ON

### **F-FCH Quasi-orthogonal Function**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:QOF <0 - 3>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:QOF?
```

Execute this command to set the quasi-orthogonal function channel value.

Range: 0 through 3

\*RST Value: 0

### **F-FCH Radio Configuration**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:RCONfig <1 - 5>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:RCONfig?
```

Execute this command to set the radio configuration value for the forward fundamental channel.

Range: 1 through 5

\*RST Value: 1

### **F-FCH State**

Forward:

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe]?
```

Execute this command to set the operating state for the forward fundamental channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### **F-FCH Walsh Code**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:WALSh <0 - 63>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:WALSh?
```

Execute this command to set the Walsh code for the forward fundamental channel.

Range: 0 through 63

\*RST Value: 10

## Forward Paging Channel Setup

### F-PCH Data

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:DATA DEFault |  
"<file name>"  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:DATA?
```

Execute this command to configure the data field for the forward paging channel. A user-defined file can have a maximum length of 512 bytes. See [“Understanding the Forward Paging Channel”](#) on page 4-17.

Choices: DEFault (default paging file) or “<file name>” (user-defined paging file)

\*RST Value: Default

### F-PCH Data Rate

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:RATE 4.8kbps | 9.6kbps  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:RATE?
```

Execute this command to set the data rate for the forward paging channel.

Choices: 4.8 kbps or 9.6 kbps

\*RST Value: 9.6 kbps

### F-PCH Long Code Mask Field 1

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F1 <0 - 0x1FFF>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F1?
```

Execute this command to set the value for field 1 for the forward paging channel long code mask.

Range: 0 through 0x1FFF

\*RST Value: 18CD hexadecimal

### F-PCH Long Code Mask Field 2

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F2 <0 - 0x1F>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F2?
```

Execute this command to set the value for field 2 for the forward paging channel long code mask.

Range: 0 through 0x1F

\*RST Value: 0

### F-PCH Long Code Mask Field 3

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F3 <0 - 0xFFF>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F3?
```

Execute this command to set the value for field 3 for the forward paging channel long code mask.

Range: 0 through 0xFFFF

\*RST Value: 0

### F-PCH Long Code Mask Query

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask?
```

Execute this command to output the contents of the long code mask field for the forward paging channel.

### F-PCH Message

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:MESSAge <bit_count>,  
<datablock>
```

Execute this command to send a bit count and a data block to queue up messaging to the paging channel. This command can be used to generate a one-time page message (asynchronous paging message). After the message is played, the signal generator reverts to the original paging file messages. See Chapter 3 “Remote Data Transfer,” in the programming guide for details on formatting the datablock.

### F-PCH Power

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:POWER <0 - -40dB>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:POWER?
```

Execute this command to set the power for the forward paging channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### F-PCH State

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe]?
```

Execute this command to set the operating state for the forward paging channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### **F-PCH Walsh Code**

```
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPCh:SETup:WALSh <0 - 63>  
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPCh:SETup:WALSh?
```

Execute this command to set the Walsh code for the forward paging channel.

Range: 0 through 63

\*RST Value: 1

### **Forward Pilot Channel Setup**

#### **F-PICH PN Offset**

```
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPICH:SETup:PNOFFset <0 - 511>  
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPICH:SETup:PNOFFset?
```

Execute this command to set the PN offset for the forward pilot channel.

Range: 0 through 511

#### **F-PICH Power**

```
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPICH:SETup:POWer <0 - -40dB>  
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPICH:SETup:POWer?
```

Execute this command to set the power for the forward pilot channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

#### **F-PICH State**

```
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPICH[ :STATE ] ON|OFF|1|0  
[ :SOURCE ]:RADio:CDMA2000[ :BBG ][ :FORWARD ]:FPICH[ :STATE ]?
```

Execute this command to set the operating state for the forward pilot channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

## Forward Supplemental Traffic Channel Setup

### F-SCH Data

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:DATA PN9|PN15|  
FIX4|"<file name>"|EXT  
[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:DATA?
```

Execute this command to configure the data field for the forward supplemental traffic channel. The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files
EXT	External input data pattern

\*RST Value: PN9

### F-SCH Data Rate

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:  
RATE <RC dependent: 19.2, 28.8, 38.4, 57.6, 76.8, 115.2, 153.6, 230.4, or  
307.2kbps>  
[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:RATE?
```

Execute this command to set the data rate for the forward supplemental traffic channel. The choices are the following:

<b>RC3:</b> 19.2, 38.4, 76.8, or 153.6 kbps	<b>Default:</b> 19.2 kbps
<b>RC4:</b> 19.2, 38.4, 76.8, 153.6, or 307.2 kbps	<b>Default:</b> 19.2 kbps
<b>RC5:</b> 28.8, 57.6, 115.2, or 230.4 kbps	<b>Default:</b> 28.8 kbps

\*RST Value: 19.2 kbps (RC3)

### F-SCH FIX4

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:DATA:  
FIX4 <0 - 15>  
[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:DATA:FIX4?
```

Execute this command to select a fixed 4-bit data pattern that repeats as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### F-SCH Frame Offset

```
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:FOffset <0 - 15>  
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:FOffset?
```

Execute this command to set the frame offset value.

Range: 0 through 15

Default Value: 0

### F-SCH Long Code Mask ESN

```
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:LCMask:  
ESN <0 - 0xFFFFFFFF>  
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:LCMask:ESN?
```

Execute this command to define the permuted electronic serial number (ESN) for the long code mask. This is used to identify a particular mobile.

Range: 0 through 0xFFFFFFFF

\*RST Value: 0

### F-SCH Long Code Mask Header

```
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:LCMask:  
HEADer <0 - 0x3FF>  
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:LCMask:HEADer?
```

Execute this command to set the header for the long code mask, which is used to identify a particular mobile.

Range: 0 through 0x3FF

\*RST Value: 318 hexadecimal

### F-SCH Long Code Mask Query

```
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:LCMask?
```

Execute this query to output the contents of the long code mask field for the forward supplemental traffic channel.

### F-SCH Power

```
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:POWer <0 - -40dB>  
[ :SOURCE ]:RADIo:CDMA2000[ :BBG ] [ :FORWARD ]:FSCH[ 1 ] | 2:SETup:POWer?
```

Execute this command to set the power for the forward supplemental traffic channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB



### **F-SCH Quasi-orthogonal Function**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:QOF <0 - 3>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:QOF?
```

Execute this command to set the quasi-orthogonal function value for the traffic channel.

Range: 0 through 3

\*RST Value: 0

### **F-SCH Radio Configuration**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:RCONfig <3 - 5>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:RCONfig?
```

Execute this command to set the radio configuration value for the forward supplemental traffic channel.

Range: 3 through 5

\*RST Value: 3

### **F-SCH State**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2[:STATE] ON|OFF|1|0  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2[:STATE]?
```

Execute this command to set the operating state for the forward supplemental traffic channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### **F-SCH Turbo Coding State**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:TCODE ON|OFF|1|0  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:TCODE?
```

Execute this command to set the turbo coding operating state for the forward supplemental traffic channel.

Choices: ON (1) or OFF (0).

\*RST Value: OFF

### **F-SCH Walsh Code**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:WALSh <0 - 63>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]|2:SETup:WALSh?
```

Execute this command to set the Walsh code for the forward supplemental traffic channel.

Range: 0 through 63

\*RST Value: 1

## Forward Synchronization Channel Setup

### F-SYNCH CDMA Frequency

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :CFRequency <0 - 2047>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :CFRequency?
```

Execute this command to set the CDMA channel frequency for the forward synchronization channel.

Range: 0 through 2047

\*RST Value: 50

### F-SYNCH Daylight Savings Time Offset

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :DAYLt <0 - 1>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :DAYLt?
```

Execute this command to set the daylight savings time offset for the forward synchronization channel, where 0 = off and 1 = on.

\*RST Value: 0

### F-SYNCH Extended Frequency

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :  
ECFRequency <0 - 2047>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :ECFRequency?
```

Execute this command to set the extended CDMA frequency.

Range: 0 through 2047

\*RST Value: 0

### F-SYNCH Long Code State

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :  
LCStAtE <0 - 0x3FFFFFFFFFFFF>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :FSYNc :SETup :LCStAtE?
```

Execute this command to set the long code seed used to generate the long code for the forward synchronization channel.

Range: 0 through 0x3FFFFFFFFFFFF

\*RST Value: 0

### **F-SYNCH Leap Seconds**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:LPSec <0 - 255>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:LPSec?
```

Execute this command to set the leap seconds value for the forward synchronization channel.

Range: 0 through 255

\*RST Value: 0

### **F-SYNCH Local Time Offset**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:LTMoff <0 - 63>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:LTMoff?
```

Execute this command to set the current local time offset for the forward synchronization channel, where 1= 30 minutes, 2= 60 minutes, 3= 90 minutes, and so on.

Range: 0 through 63

\*RST Value: 0

### **F-SYNCH Minimum Protocol Revision Level**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:MPREv <0 - 255>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:MPREv?
```

Execute this command to set the minimum protocol revision level for the forward synchronization channel.

Range: 0 through 255

\*RST Value: 1

### **F-SYNCH Message Type**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:MSGType <0 - 255>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:MSGType?
```

Execute this command to set the message type value for the forward synchronization channel.

Range: 0 through 255

\*RST Value: 1

### **F-SYNCH Network Identification**

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:NID <0 - 65535>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:NID?
```

Execute this command to set the network identification value for the forward synchronization channel.

Range: 0 through 65535

\*RST Value: 1

### **F-SYNCH Power**

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:POWer <0 - -40dB>  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:POWer?
```

Execute this command to set the power level for the forward synchronization channel.

Range: 0 dB through -40 dB

\*RST Value: 0 dB

### **F-SYNCH Paging Channel Data Rate**

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:PRATe <0 - 3>  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:PRATe?
```

Execute this command to set the BTS paging rate.

Range: 0 through 3

\*RST Value: 0

### **F-SYNCH Protocol Revision Level**

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:PREV <0 - 255>  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:PREV?
```

Execute this command to set the protocol revision level for the forward synchronization channel.

Range: 0 through 255

\*RST Value: 1

### **F-SYNCH Reserved Field**

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc:SETup:RESERved?
```

Execute this command to query the reserved field value. Currently, base stations and mobiles ignore reserved bits, so the reserved field should be set to "0" with the query returning the same value (see "[RESERVED](#)" on page 3-77 for more information).

\*RST Value: 00

### **F-SYNCH State**

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc[ :STATe ] ON|OFF|1|0  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:FSYNc[ :STATe ]?
```

Execute this command to set the operating state for the forward synchronization channel.

Choices: ON (1) or OFF (0).

\*RST Value: OFF

### **F-SYNCH System Identification**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:SID <0 - 32767>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:SID?
```

Execute this command to set the system identification for the forward synchronization channel.

Range: 0 through 32767

\*RST Value: 7

### **F-SYNCH System Time**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:  
SYSTime <0 - 0xFFFFFFFF>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:SYSTime?
```

Execute this command to set the system time value for the forward synchronization channel.

Range: 0 through 0xFFFFFFFF

\*RST Value: 0

### **F-SYNCH Type**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:  
STYPe IS95|JSTD8|IS2000  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:STYPe?
```

Execute this command to select the forward synchronization channel type.

Choices: IS95, JSTD8, or IS2000.

\*RST Value: JSTD8

### **F-SYNCH Walsh Code**

```
[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:WALSh <0 - 63>  
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:WALSh?
```

Execute this command to set the Walsh code for the forward synchronization channel.

Range: 0 through 63

\*RST Value: 32

## **IQ**

### **IQ Map Rotation**

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:IQRotation STANdard|ROTated  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:IQRotation?
```

Execute this command set the IQ map rotation to either standard or rotated (45 degrees) mode. Rotated mode is usually used in a multi-ESG setup where more than two rotated channels are desired. See [“IQ Map Rotation Std. Rotated”](#) on page 3-52.

\*RST Value: Standard

### **IQ Percent Power Other**

Forward:

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:IQ:PPOther <0 - 4>  
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:IQ:PPOther?
```

Reverse:

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ]:REVerse:IQ:PPOther <0 - 4>  
[ :SOURce ]:RADio:CDMA2000[ :BBG ]:REVerse:IQ:PPOther?
```

Execute this command to set the percent power of the paired ESG after setting the powers of both ESGs. The value to enter is obtained by querying the other ESG (see “IQ Percent Power Query”). Once this is done, the Scale to 0 function will take into account the IQ power of both ESGs.

---

**NOTE** For the single-ESG setup, leave this set to 0.0 percent.

---

\*RST Value: 0.000000

### **IQ Percent Power Query**

Forward:

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ][ :FORWard ]:IQ:PPower?
```

Reverse:

```
[ :SOURce ]:RADio:CDMA2000[ :BBG ]:REVerse:IQ:PPower?
```

Execute this query on each ESG in a two-ESG configuration to output the value of the current IQ percent power. This value can then be entered into the paired ESG by using the appropriate SCPI command in the “IQ Percent Power Other” section.

## **IQ Voltage Scale**

Forward:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:SCALE <0 - -40dB>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:SCALE?
```

Reverse:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:SCALE <0 - -40dB>  
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:SCALE?
```

Execute this command to adjust the total IQ output power. This value is filled in automatically after setting the IQ Voltage Other ESG value of both ESGs. Because changing this value affects total power, you will also see individual channel power adjustments.

Range: 0 dB through -40 dB

\*RST Value: 0 dB

## **IQ Total Voltage Other ESG**

Forward:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:TVOTHER <0 - 4V>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:TVOTHER?
```

Reverse:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:TVOTHER <0 - 4V>  
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:TVOTHER?
```

Execute this command to set the total voltage value of the paired ESG after setting the powers of both ESGs. The value to enter is obtained by querying the other ESG (see “IQ Total Voltage Query”). After setting this value, the IQ voltage scale will be automatically generated.

---

**NOTE** For the single-ESG setup, leave this set to 0.0 V.

---

## **IQ Total Voltage Query**

Forward:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:TVOLTAGE?
```

Reverse:

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:TVOLTAGE?
```

Execute this query on each ESG in a two-ESG configuration to output the value of the current total voltage. This value can then be entered into the paired ESG by using the appropriate SCPI command in the “IQ Total Voltage Other ESG” section.

## OCNS Channel Setup

### OCNS Power

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :OCNS:SETup:POWer <0 - -40dB>  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :OCNS:SETup:POWer?
```

Execute this command to set the power for the orthogonal channel noise simulator.

Range: 0 dB through -40dB

\*RST Value: 0.00 dB

### OCNS State

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :OCNS [ :STATe ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :OCNS [ :STATe ] ?
```

Execute this command to set the operating state for the orthogonal channel noise simulator.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### OCNS Walsh Code

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :OCNS:SETup:WALSh <0 - 63>  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :OCNS:SETup:WALSh?
```

Execute this command to set the Walsh code for the orthogonal channel noise simulator.

Range: 0 through 63

\*RST Value: 61

## Phase Polarity

Forward:

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :POLarity [ :ALL ] NORMAL | INVerted  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] [ :FORward ] :POLarity [ :ALL ] ?
```

Reverse:

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:POLarity [ :ALL ] NORMAL | INVerted  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:POLarity [ :ALL ] ?
```

Execute this command to set the phase polarity to either normal or inverted. Inverted mode inverts the internal Q signal, reversing the direction of phase rotation.

\*RST Value: Normal



## Quick Paging Channel Setup

### QPCH Configuration Change

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:CCI <0 - 3>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:CCI?
```

Execute this command to select the configuration change indicator for the quick paging channel.

Range: 0 through 3

\*RST Value: 3

### QPCH Data Rate

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:  
RATE 2.4kbps|4.8kbps>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:RATE?
```

Execute this command to set the data rate for the quick paging channel.

Choices: 2.4 kbps or 4.8 kbps

\*RST Value: 4.8 kbps

### QPCH Paging Indicator

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:PI <0 - 383>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:PI?
```

Execute this command to select the paging slots for the quick paging channel.

Range: 0 through 383

\*RST Value: 0

### QPCH Power

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:POWER <0 - -40dB>  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:POWER?
```

Execute this command to set the power for the quick paging channel.

Range: 0 dB through -40dB

\*RST Value: 0.00 dB

### QPCH State

```
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH[:STATE] ON|OFF|1|0  
[ :SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:QPCH[:STATE]?
```

Execute this command to set the operating state for the quick paging channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

## QPCH Walsh Code

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :QPCH :SETup :WALSh <0 - 127>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORward ] :QPCH :SETup :WALSh?
```

Execute this command to set the Walsh code for the quick paging channel.

Range: 0 through 127

\*RST Value: 80

## Reverse Access Channel Setup

### R-ACH Data

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RACH :SETup :DATA PN9 | PN15 | FIX4 |  
"<file name>"  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RACH :SETup :DATA?
```

Execute this command to configure the data field for the reverse access channel. The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files

\*RST Value: PN9

### R-ACH Data Rate

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RACH :SETup :RATE?
```

Execute this command to query the data rate for the reverse access channel.

\*RST Value: 4.8 kbps

### R-ACH FIX4

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RACH :SETup :DATA :FIX4 <0 - 15>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RACH :SETup :DATA :FIX4?
```

Execute this command to select a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### **R-ACH Frame Length**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:FLENgth?
```

Execute this command to query the frame length for the reverse access channel.

\*RST Value: 20 ms

### **R-ACH Frame Offset**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:FOFFset <0 - 15>  
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:FOFFset?
```

Execute this command to set the frame offset value for the reverse access channel.

Range: 0 through 15

\*RST Value: 0

### **R-ACH Power**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:POWer <0 - -40dB>  
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:POWer?
```

Execute this command to set the power for the reverse access channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### **R-ACH State**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH[:STATe] ON|OFF|1|0  
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH[:STATe]?
```

Execute this command to set the operating state for the reverse access channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

## **Reverse cdma2000 Setup**

### **Data Clock Out for RC1 and RC2**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DCOut CCLK|CLK20ms|  
CLK80ms|CLK4khz|CLK307khz  
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DCOut?
```

Execute this command to set the output of the DATA CLK OUT rear panel BNC/SMB connector.

\*RST Value: Chip Clock

### Data Clock Out for RC3 and RC4

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :DCOut CCLK | CLK5ms |  
CLK10ms | CLK20ms | CLK40ms | CLK80ms  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :DCOut ?
```

Execute this command to set the output of the DATA CLK OUT rear panel BNC/SMB connector.

\*RST Value: Chip Clock

### Data Out for RC1 and RC2

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC12 :  
DOUT LCODe | IOUTh | QOUT  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC12 :DOUT ?
```

Execute this command to set the output of the DATA OUT rear panel BNC/SMB connector.

\*RST Value: Long code

### Data Out for RC3 and RC4

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :DOUT LCODe | PILOt |  
RSCHcoded | RDCChcoded | RFCHcoded | RCCChcoded | REAChcoded | ZI | ZQ  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :DOUT ?
```

Execute this command to set the output of the DATA OUT rear panel BNC/SMB connector.

\*RST Value: Long code

### Event 1 for RC1 and RC2

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC12 :  
EVENT DESecond | PNSync  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC12 :EVENT ?
```

Execute this command to set the output of the EVENT 1 rear panel BNC/SMB connector.

\*RST Value: Delayed Even Second

### Event 1 for RC3 and RC4

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :EVENT DESecond | PNSync  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :EVENT ?
```

Execute this command to set the output of the EVENT 1 rear panel BNC/SMB connector.

\*RST Value: Delay Even Second

## Long Code Mask

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCMask <0 - 0x3FFFFFFFFF>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCMask?
```

Execute this command to set a unique serial number code to identify a mobile station.

Range: 0 through 0x3FFFFFFFFF

---

**NOTE** The storage register for the long code mask allows a 42-bit binary number to be entered. However, it may be possible to enter a value larger than 42 bits, and in this instance, the register value would be unknown.

---

\*RST Value: 0

## Long Code State

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCState <0 - 0x3FFFFFFFFF>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCState?
```

Execute this command to set a unique code to address a mobile station.

---

**NOTE** The storage register for the long code state allows a 42-bit binary number to be entered. However, it may be possible to enter a value larger than 42 bits, and in this instance, the register value would be unknown.

---

Range: 0 through 0x3FFFFFFFFF

\*RST Value: 0

## Radio Configuration

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCONfig <1 - 4>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCONfig?
```

Execute this command to select the radio configuration value for the reverse channels.

Range: 1 through 4

\*RST Value: 3

## Symbol Synchronization Out for RC1 and RC2

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:SSOut EVENsecond|  
LCSync  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:SSOut?
```

Execute this command to set the output of the SYMBOL SYNC OUT rear panel BNC/SMB connector.

\*RST Value: Even Second

## Symbol Synchronization Out for RC3 and RC4

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :SSOut EVENsecond |  
LCSync  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :BNCMux :RC34 :SSOut ?
```

Execute this command to set the output of the SYMBOL SYNC OUT rear panel BNC/SMB connector.

\*RST Value: Even Second

## Trigger Advance

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :TADVance <0 - 2457599>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :TADVance ?
```

Execute this command to select a number of chips to advance the trigger time slot.

Range: 0 through 2457599

\*RST Value: 18

## Trigger Edge

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :TEDGe RISing | FALLing  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :TEDGe ?
```

Execute this command to select a falling or rising trigger edge state.

\*RST Value: Falling

## Reverse Common Control Channel Setup

### R-CCCH Data

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RCCCh :SETup :DATA PN9 | PN15 | FIX4 |  
"<file name>"  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RCCCh :SETup :DATA ?
```

Execute this command to configure the data field for the reverse common control channel. The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files

\*RST Value: PN9

### R-CCCH Data Rate

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:
RATE 9.6kbps|19.2kbps|38.4kbps
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:RATE?
```

Execute this command to adjust the data rate for the reverse common control channel. The choices are the following:

**RC3 or RC4:** 9.6, 19.2, or 38.4 kbps      **Default:** 38.4 kbps

\*RST Value: 38.4 kbps

### R-CCCH FIX4

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA:FIX4 <0 - 15>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA:FIX4?
```

Execute this command to select a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### R-CCCH Frame Length

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:FLENgth 5ms|10ms|20ms
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:FLENgth?
```

Execute this command to set the frame length value for the reverse common control channel.

Choices: 5, 10, or 20 ms

\*RST Value: 20

### R-CCCH Frame Offset

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:FOFFset <0 - 15>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:FOFFset?
```

Execute this command to set the frame offset value for the reverse common control channel.

Range: 0 through 15

\*RST Value: 0

### R-CCCH Power

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:POWer <0 - -40dB>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:POWer?
```

Execute this command to set the power for the reverse common control channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

## R-CCCH State

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RCCCh [ :STATE ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RCCCh [ :STATE ] ?
```

Execute this command to set the operating state for the reverse common control channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

## R-CCCH Walsh Code

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RCCCh:SETup:WALSh <0 - 7>  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RCCCh:SETup:WALSh?
```

Execute this command to set the Walsh code for the reverse common control channel.

Range: 0 through 7

\*RST Value: 2

## Reverse Dedicated Control Channel Setup

### R-DCCH Data

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RDCCh:SETup:DATA PN9 | PN15 | FIX4 |  
<file name>"  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RDCCh:SETup:DATA?
```

Execute this command to configure the data field for the reverse dedicated control channel.  
The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files

\*RST Value: PN9

### R-DCCH Data Rate

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RDCCh:SETup:RATE?
```

Execute this command to query the data rate for the reverse dedicated control channel.

\*RST Value: 9.6 kbps



### R-DCCH FIX4

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA:FIX4 <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA:FIX4?
```

Execute this command to select a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### R-DCCH Frame Length

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:FLENgth 5ms|20ms  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:FLENgth?
```

Execute this command to set the frame length value for the reverse dedicated control channel.

Choices: 5 or 20 ms

\*RST Value: 20 ms

### R-DCCH Frame Offset

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:FOFFset <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:FOFFset?
```

Execute this command to set the frame offset value for the reverse dedicated control channel.

Range: 0 through 15

\*RST Value: 0

### R-DCCH Power

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:POWer <0 - -40dB>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:POWer?
```

Execute this command to set the power for the reverse dedicated control channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### R-DCCH State

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh[:STATe]?
```

Execute this command to set the operating state for the reverse dedicated control channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

## R-DCCH Walsh Code

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RDCCh:SETup:WALSh <0 - 15>  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:RDCCh:SETup:WALSh?
```

Execute this command to set the Walsh code for the reverse dedicated control channel.

Range: 0 through 15

\*RST Value: 8

## Reverse Enhanced Access Channel Setup

### R-EACH Data

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:REACH:SETup:DATA PN9 | PN15 | FIX4 |  
"<file name>"  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:REACH:SETup:DATA?
```

Execute this command to configure the data field for the reverse enhanced access channel. The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files

\*RST Value: PN9

### R-EACH Data Rate

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:REACH:SETup:  
RATE 9.6kbps | 19.2kbps | 38.4kbps  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:REACH:SETup:RATE?
```

Execute this command to adjust the data rate for the reverse enhanced access channel. The choices are the following:

**RC3 or RC4:** 9.6, 19.2, or 38.4 kbps      **Default:** 38.4 kbps

\*RST Value: 38.4 kbps (RC3)

### R-EACH FIX4

```
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:REACH:SETup:DATA:FIX4 <0 - 15>  
[ :SOURCE ] :RADio:CDMA2000 [ :BBG ] :REVerse:REACH:SETup:DATA:FIX4?
```

Execute this command to select a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### R-EACH Frame Length

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:FLENGTH 5ms|10ms|20ms  
[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:FLENGTH?
```

Execute this command to set the frame length value for the reverse enhanced access channel.

Choices: 5, 10, or 20ms

\*RST Value: 20 ms

### R-EACH Frame Offset

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:FOFFSET <0 - 15>  
[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:FOFFSET?
```

Execute this command to set the frame offset value for the reverse enhanced access channel.

Range: 0 through 15

\*RST Value: 0

### R-EACH Power

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:POWER <0 - -40dB>  
[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:POWER?
```

Execute this command to set the power for the reverse enhanced access channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### R-EACH State

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH[:STATE] ON|OFF|1|0  
[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH[:STATE]?
```

Execute this command to set the operating state for the reverse enhanced access channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### R-EACH Walsh Code

```
[ :SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:WALSH <0 - 7>  
[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:WALSH?
```

Execute this command to set the Walsh code for the reverse enhanced access channel.

Range: 0 through 7

\*RST Value: 2

## Reverse Fundamental Channel Setup

### R-FCH Data

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA PN9|PN15|FIX4|  
"<file name>"  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA?
```

Execute this command to configure the data field for the reverse fundamental channel. The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files

\*RST Value: PN9

### R-FCH Data Rate

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:  
RATE <RC dependent: 1.2, 1.5, 1.8, 2.4, 2.7, 3.6, 4.8, 7.2, 9.6, or  
14.4kbps>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:RATE?
```

Execute this command to adjust the data rate for the reverse fundamental channel. The choices are the following:

<b>RC1:</b> 1.2, 2.4, 4.8, or 9.6 kbps	<b>Default:</b> 9.6 kbps
<b>RC2:</b> 1.8, 3.6, 7.2, or 14.4 kbps	<b>Default:</b> 14.4 kbps
<b>RC3:</b> 1.5, 2.7, 4.8, or 9.6 kbps	<b>Default:</b> 9.6 kbps
<b>RC4:</b> 1.8, 3.6, 7.2, or 14.4 kbps	<b>Default:</b> 14.4 kbps

\*RST Value: 9.6 kbps (RC3)

### R-FCH FIX4

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA:FIX4 <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA:FIX4?
```

Execute this command to select a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 0000

### **R-FCH Frame Length**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:FLENgth 5ms|20ms  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:FLENgth?
```

Execute this command to set the frame length value for the reverse fundamental channel.

Choices: 5 or 20 ms

\*RST Value: 20 ms

### **R-FCH Frame Offset**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:FOffset <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:FOffset?
```

Execute this command to set the frame offset value for the reverse fundamental channel.

Range: 0 through 15

\*RST Value: 0

### **R-FCH Power**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:POWer <0 - -40dB>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:POWer?
```

Execute this command to set the power for the reverse fundamental channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### **R-FCH State**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH[:STATe]?
```

Execute this command to set the operating state for the reverse fundamental channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### **R-FCH Walsh Code**

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:WALSh <0 - 15>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:WALSh?
```

Execute this command to set the Walsh code for the reverse fundamental channel.

Range: 0 through 15

\*RST Value: 4

## Reverse Pilot Channel Setup

### R-PICH Gating

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :  
GRATe FULL | HALF | QUARter |  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :GRATe ?
```

This command enables you to configure the gating data field for the reverse pilot channel. The choices are the following:

FULL	Transmits all sixteen power control bits
HALF	Transmits eight power control bits
QUARter	Transmits four power control bits

\*RST Value: FULL

### R-PICH Power Control Bit

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :PCB <0 - 0xFFFF>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :PCB ?
```

Execute this command to adjust the power control bit for the reverse pilot channel.

Range: 0 through 0xFFFF

\*RST Value: 0000 kbps

### R-PICH Power

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :POWer <0 - -40dB>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :POWer ?
```

Execute this command to set the power for the reverse pilot channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### R-PICH State

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH [ :STATe ] ?
```

Execute this command to set the operating state for the reverse pilot channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF

### R-PICH Walsh Code

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RPICH :SETup :WALSh ?
```

Execute this command to query the Walsh code for the reverse pilot channel.

## Reverse Supplemental Channel Setup (RC1 and RC2)

### R-SCH Data (RC1 and RC2)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA PN9|PN15|FIX4|
"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA?
```

Execute this command to configure the data field for the reverse supplemental channel. The choices are the following:

PN9	Pseudorandom bit pattern
PN15	Pseudorandom bit pattern
FIX4	4-bit repeating sequence data pattern
"<file name>"	A file in the catalog of binary files

\*RST Value: PN9

### R-SCH Data Rate (RC1 and RC2)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:
RATE <RC dependent: 1.2, 1.8, 2.4, 3.6, 4.8, 7.2, 9.6, or 14.4kbps>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:RATE?
```

Execute this command to set the data rate for the reverse supplemental channel. The choices are the following:

<b>RC1:</b> 1.2, 2.4, 4.8, or 9.6 kbps	<b>Default:</b> 9.6 kbps
<b>RC2:</b> 1.8, 3.6, 7.2, or 14.4 kbps	<b>Default:</b> 14.4 kbps

### R-SCH FIX4 (RC1 and RC2)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA:FIX4 <0 - 15>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA:FIX4?
```

Execute this command to set a fixed 4-bit data pattern that repeats as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 00

### R-SCH Frame Length (RC1 and RC2)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:FLENgth?
```

Execute this command to query the frame length value for the reverse supplemental channel.

### **R-SCH Frame Offset (RC1 and RC2)**

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH :SETup :FOFFset <0 - 15>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH :SETup :FOFFset ?
```

Execute this command to set the frame offset value for the reverse supplemental channel.

Range: 0 through 15

\*RST Value: 0

### **R-SCH Power (RC1 and RC2)**

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH :SETup :  
POWer <0 - -40dB>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH :SETup :POWer ?
```

Execute this command to set the power for the reverse supplemental channel.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### **R-SCH State (RC1 and RC2)**

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH [ :STATe ] ?
```

Execute this command to set the operating state for the reverse supplemental channel.

Choices: ON (1) or OFF (0)

\*RST Value: OFF



## Reverse Supplemental Channel Setup (RC3 and RC4)

The ESG, for RC3 and RC4, uses R-SCH<sub>0</sub> and R-SCH<sub>1</sub> to differentiate between the two supplemental channels. However, the SCPI command designations for the same two supplemental channels use RSCH1 and RSCH2 respectively. Table 5-1. shows the relationship and channel position for the SCPI R-SCH designations.

**Table 5-1. RC3 and RC4 Reverse Supplemental Channel Designation**

ESG 1				ESG 2			
Ch 1	Ch 2	Ch 3	Ch 4	Ch 1	Ch 2	Ch 3	Ch 4
			R-SCH <sub>0</sub> (ESG) R-SCH1 (SCPI)		R-SCH <sub>1</sub> (ESG) R-SCH2 (SCPI)		

### R-SCH Data (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA PN9 | PN15 | FIX4 |
"<file name>"
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA PN9 | PN15 | FIX4 |
"<file name>"
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA?
```

Execute this command to configure the data field. The choices are the following:

- PN9                               Pseudorandom bit pattern
- PN15                              Pseudorandom bit pattern
- FIX4                              4-bit repeating sequence data pattern
- "<file name>"                A file in the catalog of binary files

\*RST Value: PN9

### R-SCH Data Rate (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:
RATE <RC and frame length dependent: 1.2, 1.35, 1.5, 1.8, 2.4, 2.7, 3.6,
4.8, 7.2, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 76.8, 115.2, 153.6, 230.4, or
307.2kbps>
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:RATE?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:
RATE <RC and frame length dependent: 1.2, 1.35, 1.5, 1.8, 2.4, 2.7, 3.6,
4.8, 7.2, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 76.8, 115.2, 153.6, 230.4, or
307.2kbps>
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:RATE?
```

Execute this command to set the data rate. The choices are the following:

#### RC3 Frame Length Data Rate

20 ms: 1.5, 2.7, 4.8, 9.6, 19.2, 38.4, 76.8, 153.6, or 307.2 kbps

40 ms: 1.35, 2.4, 4.8, 9.6, 19.2, 38.4, 76.8, or 153.6 kbps

80 ms: 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, or 76.8 kbps

Default: 307.2 kbps (20 ms frame length)

#### RC4 Frame Length Data Rate

20 ms: 1.8, 3.6, 7.2, 14.4, 28.8, 57.6, 115.2, or 230.4 kbps

40 ms: 1.8, 3.6, 7.2, 14.4, 28.8, 57.6, or 115.2 kbps

80 ms: 1.8, 3.6, 7.2, 14.4, 28.8, or 57.6 kbps

Default: 230.4 kbps (20 ms frame length)

\*RST Value: 307.2 kbps (RC3)

### R-SCH FIX4 (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA:FIX4 <0 - 15>
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA:FIX4?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA:FIX4 <0 - 15>
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA:FIX4?
```

Execute this command to set a fixed 4-bit data pattern that repeats as necessary to fill the selected data area.

Range: 0 through 15

\*RST Value: 00

### R-SCH Frame Length (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:FLENgth 20ms|40ms|80ms  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:FLENgth?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:FLENgth 20ms|40ms|80ms  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:FLENgth?
```

Execute this command to set the frame length value.

Choices: 20, 40, or 80 ms

\*RST Value: 20

### R-SCH Frame Offset (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:FOFFset <0 - 63>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:FOFFset?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:FOFFset <0 - 63>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:FOFFset?
```

Execute this command to set the frame offset value.

Range: 0 through 63

\*RST Value: 0

### R-SCH Power (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:POWer <0 - -40dB>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:POWer?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:POWer <0 - -40dB>  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:POWer?
```

Execute this command to set the power level.

Range: 0 dB through -40 dB

\*RST Value: 0.00 dB

### R-SCH State (RC3 and RC4)

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1[:STATe]?
```

```
[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2[:STATe] ON|OFF|1|0  
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2[:STATe]?
```

Execute this command to set the operating state.

Choices: ON (1) or OFF (0).

\*RST Value: OFF

### **R-SCH Turbo Coding (RC3 and RC4)**

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH1 :SETup :TCODE ON | OFF | 1 | 0  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH1 :SETup :TCODE ?
```

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH2 :SETup :TCODE ON | OFF | 1 | 0  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH2 :SETup :TCODE ?
```

Execute this command to enable turbo coding. Ensure that this function is being executed with the correct data rate.

\*RST Value Off

### **R-SCH Walsh Code (RC3 and RC4)**

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH1 :SETup :WALSh <0 - 7>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH1 :SETup :WALSh ?
```

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH2 :SETup :WALSh <0 - 7>  
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :RSCH2 :SETup :WALSh ?
```

Execute this command to set the Walsh code.

Range: 0 through 7

\*RST Value: 1

### **Spreading Rate**

Forward:

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] [ :FORWard ] :SPReading :RATE ?
```

Reverse:

```
[ :SOURce ] :RADio :CDMA2000 [ :BBG ] :REVerse :SPReading :RATE ?
```

Execute this command to return the value of the current spreading rate.

---

## Programming Examples

This section provides the following programming examples:

- A single-ESG setup on [page 5-44](#).
- A two-ESG setup on [page 5-46](#).

## Single-ESG Setup

Use this example to configure the single-ESG setup.

```

10 !*****
20 !
30 ! PROGRAM DESCRIPTION:  In this example, the instrument is
40 ! configured for a one-ESG setup.
50 !
60 ! Text within the '[' is optional. Lower case is also optional.
70 !
80 ! If this example is used with HP Basic, every line must start with
90 ! 'OUTPUT < GPIB Address >,'.
100 !
110 !
120 !*****

130 *RST
140 [:SOURCE]:FREQuency[:CW] 900 MHZ
150 [:SOURCE]:POWEr[:LEVEl][:IMMediate][:AMPLitude] -40 DBM
160 :OUTPut[::STATe] ON
170 ! *****
180 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:POLarity[:ALL] NORMal
190 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:IQRotation STANDARD
200 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:BBClock INT
210 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FILTer IS95 EQ
220 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:ESDelay 17.5
230 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:LCState 1
240 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FPICH:SETup:PNOFFset 0
250 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:IQ:SCALE 0 DB
260 ! *****
270 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FPICH[:STATe] ON
280 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FPICH:SETup:POWEr -7.00 DB
290 ! *****
300 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc[:STATe] ON
310 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:POWEr -13.00 DB
320 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:WALSh 32
330 ! *****
340 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe] ON
350 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:POWEr -10.00 DB
360 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:WALSh 8
370 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:RCONfig 1
380 ! *****
390 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe] ON
400 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:POWEr -10.00 DB
410 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:WALSh 1
420 ! *****
430 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWard]:PADJust SCALE
440 [:SOURCE]:RADio:CDMA2000[:BBG][:STATe] ON
450 [:SOURCE]:DM:SOURce INTernal
460 END
    
```

### Program Comments

10 to 120:	Program description.
130:	Reset the signal generator.
140:	Set the center frequency of the carrier.
150:	Set the amplitude to -40 dBm.
160:	Turn on the RF output operating state.
170:	
180:	Set the phase polarity to normal.
190:	Set the IQ rotation to standard.
200:	Set the data clock to internal.
210:	Set the filter type to IS95 EQ.
220:	Set the seven second delay to 17.5 cps to align RF with trigger.
230:	Set the forward sync channel long code state to 1.
240:	Set the forward pilot channel PN offset to 0.
250:	Set the total power output at IQ to 0.
260:	
270:	Turn on the forward pilot channel operating state.
280:	Set the forward pilot channel power to -7.00 dB.
290:	
300:	Turn on the forward sync channel operating state.
310:	Set the forward sync channel power to -13.00 dB.
320:	Set the forward sync channel Walsh code to 32.
330:	
340:	Turn on the forward fundamental channel operating state.
350:	Set the forward fundamental channel power to -10.00 dB.
360:	Set the forward fundamental channel Walsh code to 8.
370:	Set the forward fundamental channel radio configuration to 1.
380:	
390:	Turn on the forward paging channel operating state.
400:	Set the forward paging channel power to -10.00 dB.
410:	Set the forward paging channel Walsh code to 1.
420:	
430:	Set the code domain power to scale current channel power to maintain 0 dB total power.
440:	Turn on the cdma2000 operating state.
450:	Set the I/Q to internal.
460:	End of program.

## Two-ESG Setup

Use this example to configure the two-ESG setup.

---

**CAUTION** When programming two ESGs, each ESG must have a unique GPIB address.

---

```

10 !*****
20 !
30 ! PROGRAM DESCRIPTION: In this example, the instrument, ESG 1, is
40 ! configured for the two-ESG setup.
50 !
60 ! Text within the '[' is optional. Lower case is also optional.
70 !
80 ! If this example is used with HP Basic, every line must start with
90 ! 'OUTPUT < GPIB Address >'.
100 !
110 !
120 !*****
130 !ESG 1
140 !*****
150 *RST
160 [:SOURce]:FREQuency[:CW] 900 MHZ
170 [:SOURce]:POWer[:LEVel][:IMMediate][:AMPLitude] -40 DBM
180 [:SOURce]:POWer:ALC[:STATe] ON
190 :OUTPut [:STATe] ON
200 ! *****
210 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:POLarity[:ALL] NORMal
220 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:IQRotation STANDARD
230 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:BBClock EXT
240 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer IS95_EQ
250 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:ESDelay 17.5
260 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:LCState 1
270 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICH:SETup:PNOFfset 0
280 ! *****
290 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICH[:STATe] ON
300 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICH:SETup:POWer -7.00 DB
310 ! *****
320 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc[:STATe] ON
330 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:POWer -13.00 DB
340 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:WALSh 32
350 ! *****
360 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS[:STATe] ON
370 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS:SETup:POWer -3.46 DB
380 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS:SETup:WALSh 57
390 ! *****
400 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe] ON
410 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:POWer -10.00 DB
420 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:WALSh 1
430 ! *****
440 [:SOURce]:RADio:CDMA2000[:BBG][:STATe] ON
450 [:SOURce]:DM:SOURce EXTernal
460 END

```



### Program Comments

10 to 140:	Program description
150:	Reset the signal generator.
160:	Set the center frequency of the carrier.
170:	Set the amplitude to -40 dBm
180	Turn on the automatic level control operating state.
190:	Turn on the RF output operating state.
200:	
210:	Set the phase polarity to normal.
220:	Set the IQ rotation to standard.
230:	Set the data clock to external.
240:	Set the filter type to IS95 EQ.
250:	Set the seven second delay to 17.5 cps to align RF with trigger.
260:	Set the forward sync channel long code state to 1.
270:	Set the forward pilot channel PN offset to 0.
280:	
290:	Turn on the forward pilot channel operating state.
300:	Set the forward pilot channel power to -7.00 dB.
310:	
320:	Turn on the forward sync channel operating state.
330:	Set the forward sync channel power to -13.00 dB.
340:	Set the forward sync channel Walsh code to 32.
350:	
360:	Turn on the forward orthogonal I channel noise simulator operating state.
370:	Set the forward orthogonal channel noise simulator power to -3.46 dB.
380:	Set the forward orthogonal channel noise simulator channel Walsh code to 57.
390:	
400:	Turn on the forward paging channel operating state.
410:	Set the forward paging channel power to -10.00 dB.
420:	Set the forward paging channel Walsh code to 1.
430:	
440	Turn on the cdma2000 operating state.
450	Set the I/Q source to external.
460	End of program

---

**CAUTION**      When programming two ESGs, each ESG must have a unique GPIB address

---

```

10 !*****
20 !
30 ! PROGRAM DESCRIPTION: In this example, the instrument, ESG 2,is
40 ! configured for the two-ESG setup.
50 !
60 ! Text within the '[' is optional. Lower case is also optional.
70 !
80 ! If this example is used with HP Basic, every line must start with
90 ! 'OUTPUT < GPIB Address >,'.
100 !
110 !
120 !*****
130 !ESG 2
140 !*****
150 *RST
160 [:SOURCE]:FREQUENCY[:CW] 1.2288 MHZ
170 [:SOURCE]:POWER[:LEVEL][:IMMEDIATE][:AMPLITUDE] 15 DBM
180 [:SOURCE]:POWER:ALC[:STATE] OFF
190 :OUTPUT:MODULATION[:STATE] OFF
200 :OUTPUT[:STATE] ON
210 ! *****
220 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:POLARITY[:ALL] INVERTED
230 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQROTATION STANDARD
240 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:BBLOCK EXT
250 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER IS95_EQ
260 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:ESDELAY 17.5
270 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETUP:LCSTATE 1
280 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FPICH:SETUP:PNOFFSET 0
290 ! *****
300 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH[:STATE] ON
310 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETUP:POWER -10.00 DB
320 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETUP:WALSH 10
330 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETUP:RCONFIG 4
340 ! *****
350 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1][:STATE] ON
360 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]:SETUP:POWER -10.00 DB
370 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]:SETUP:WALSH 4
380 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]:SETUP:RCONFIG 4
390 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1]:SETUP:RATE 153.6kbps
400 ! *****
410 [:SOURCE]:RADIO:CDMA2000[:BBG][:STATE] ON
420 END
    
```

### Program Comments

10 to 140:	Program description
150:	Reset the signal generator.
160:	Set the frequency to 1.2288 MHz for the chip clock.
170:	Set the amplitude to 15 dBm to provide near-TTL voltages to drive the data clock.
180:	Turn off automatic level control.
190:	Turn off the RF output modulation operating state.
200:	Turn on the RF output operating state.
210:	
220:	Set the phase polarity to inverted.
230:	Set the IQ rotation to standard.
240:	Set the data clock to external.
250:	Set the filter type to IS95 EQ.
260:	Set the s even second delay to 17.5 cps to align RF with trigger.
270:	Set the forward sync channel long code state to 1.
280:	Set the forward pilot channel PN offset to 0.
290:	
300:	Turn on the forward fundamental channel operating state.
310:	Set the forward fundamental channel power to -10.00 dB.
320:	Set the forward fundamental channel Walsh code to 10.
330:	Set the forward fundamental channel radio configuration to 4.
340:	
350:	Turn on the forward supplemental channel operating state.
360:	Set the forward supplemental channel power to -10.00 dB.
370:	Set the forward supplemental channel Walsh code to 4.
380:	Set the forward supplemental channel radio configuration to 4.
390:	Set the forward supplemental channel data rate to 153.6 kbps.
400:	
410:	Turn on the cdma2000 operating state.
420:	End of program

## Option 201 and Option H03 SCPI Language Comparison

Users with programs written for Option H03 signal generators will require changes to certain SCPI commands in order to utilize an Option 201 signal generator to provide the same solution as an Option H03 signal generator.

Option H03 offered only QPSK- (or OQPSK-) modulated data without IS-95 or IS-2000 channelization. Because Option 201 provides IS-95 and IS-2000 channelization and improved performance, certain Option H03 commands no longer produce a result when applied to an Option 201 signal generator.

The following table provides a cross-reference between Option H03 SCPI commands and command queries and their equivalent Option 201 counterparts.

**Table 5-2. Option 201 and Option H03 SCPI Command Cross-Reference**

Option H03 SCPI Command	Option 201 SCPI Command
[ :SOURce]:RADio:CDMA[:BBG]:BBClock INT[1] EXT[1] [:SOURce]:RADio:CDMA[:BBG]:BBClock?	[ :SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:BBClock INT[1] EXT[1] [:SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:BBClock?  [:SOURce]:RADio:CDMA2000[:BBG]: REVERSE:BBClock INT[1] EXT[1] [:SOURce]:RADio:CDMA2000[:BBG]:REVERSE: BBClock?
[ :SOURce]:RADio:CDMA[:BBG]:CRATE <value> [:SOURce]:RADio:CDMA[:BBG]:CRATE?	[ :SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:CRATE <50 cps - 1.3 Mcps> [:SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:CRATE?  [:SOURce]:RADio:CDMA2000[:BBG]:REVERSE: CRATE <50 cps - 1.3 Mcps> [:SOURce]:RADio:CDMA2000[:BBG]:REVERSE: CRATE?
[ :SOURce]:RADio:CDMA[:BBG]:DATA PN9 PN15 FIX4 "<file name>" EXT  P4 P8 P16 P32 P64 [:SOURce]:RADio:CDMA[:BBG]:DATA?	No application. Data can be inserted into a Fundamental Traffic or Supplemental Traffic channel only. See <a href="#">“Forward Fundamental Channel Setup,”</a> and <a href="#">“Forward Supplemental Traffic Channel Setup,”</a> for similar applications.
[ :SOURce]:RADio:CDMA[:BBG]:DATA: FIX4 <0-15> [:SOURce]:RADio:CDMA[:BBG]:DATA: FIX4?	
[ :SOURce]:RADio:CDMA[:BBG]:EDCLock SYMBOL NORMAL [:SOURce]:RADio:CDMA[:BBG]:EDCLock?	No application. Option 201 does not support the use of an external data clock signal.

**Table 5-2. Option 201 and Option H03 SCPI Command Cross-Reference**

Option H03 SCPI Command	Option 201 SCPI Command
<pre>[ :SOURce]:RADio:CDMA[:BBG]: EQUalizer ON OFF 1 0 [:SOURce]:RADio:CDMA[:BBG]: EQUalizer?</pre>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:FILTer IS95 IS95_MOD  IS95_EQ IS95_MOD_EQ [:SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:FILTer?  [:SOURce]:RADio:CDMA2000[:BBG]: REVerse:FILTer IS95 IS95_EQ  IS95_MOD IS95_MOD_EQ [:SOURce]:RADio:CDMA2000[:BBG]: REVerse:FILTer?</pre>
<pre>[ :SOURce]:RADio:CDMA[:BBG]:FILTer STANdard MODified [:SOURce]:RADio:CDMA[:BBG]:FILTer?</pre>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:FILTer IS95 IS95_MOD [:SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:FILTer?  [:SOURce]:RADio:CDMA2000[:BBG]: REVerse:FILTer IS95 IS95_MOD [:SOURce]:RADio:CDMA2000[:BBG]: REVerse:FILTer?</pre>
<pre>[ :SOURce]:RADio:CDMA[:BBG]:HICRest [:STATE] ON OF 1 0 [:SOURce]:RADio:CDMA[:BBG]:HICRest [:STATE]?</pre>	<p><b>No application. Spectral regrowth issues addressed by this command are addressed with filters in Option 201.</b></p>
<pre>[ :SOURce]:RADio:CDMA[:BBG]:IQ: SCALe &lt;value&gt; [:SOURce]:RADio:CDMA[:BBG]:IQ: SCALe?</pre>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:IQ:SCALe &lt;0 - -40dB&gt; [:SOURce]:RADio:CDMA2000[:BBG] [:FORWard]:IQ:SCALe?  [:SOURce]:RADio:CDMA2000[:BBG]: REVerse:IQ:SCALe &lt;0 - -40dB&gt; [:SOURce]:RADio:CDMA2000[:BBG]: REVerse:IQ:SCALe?</pre>
<pre>[ :SOURce]:RADio:CDMA[:BBG]: MODulation QPSK OQPSK [:SOURce]:RADio:CDMA[:BBG]: MODulation?</pre>	<p><b>No application. Option 201 uses QPSK modulation for forward link only. For reverse link, OQPSK and HPSK modulation are used.</b></p>

**Table 5-2. Option 201 and Option H03 SCPI Command Cross-Reference**

Option H03 SCPI Command	Option 201 SCPI Command
<pre>[ :SOURCE]:RADIO:CDMA[:BBG]:POLarity [:ALL] NORMal INVerted [:SOURCE]:RADIO:CDMA[:BBG]:POLarity [:ALL]?</pre>	<pre>[ :SOURCE]:RADIO:CDMA2000[:BBG] [:FORWARD]:POLarity[:ALL] NORMal  INVerted [:SOURCE]:RADIO:CDMA2000[:BBG] [:FORWARD]:POLarity[:ALL]?  [:SOURCE]:RADIO:CDMA2000[:BBG]: REVERSE:POLarity[:ALL]NORMal  INVerted [:SOURCE]:RADIO:CDMA2000[:BBG]: REVERSE:POLarity[:ALL]?</pre>
<pre>[ :SOURCE]:RADIO:CDMA[:BBG]: SPReading ON OFF 1 0 [:SOURCE]:RADIO:CDMA[:BBG]: SPReading?</pre>	<p><b>No application. Spreading is always on.</b></p>
<pre>[ :SOURCE]:RADIO:CDMA[:BBG][:STATE] ON OFF 1 0 [:SOURCE]:RADIO:CDMA[:BBG][:STATE]?</pre>	<pre>[ :SOURCE]:RADIO:CDMA2000[:BBG] [:STATE] ON OFF 1 0 [:SOURCE]:RADIO:CDMA2000[:BBG] [:STATE]?</pre>

## **6 Programming Command Cross-Reference**

This chapter lists the cdma2000 softkeys and data fields along with their corresponding SCPI commands. For a complete list of the signal generator hardkeys and softkeys and their corresponding SCPI commands, please refer to the programming guide.

**Table 6-1. Mode – cdma2000 Softkeys**

Key or Data Field	SCPI Command
% Power This ESG	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:PPower? [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:PPower?
% Power Other ESG	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:PPOther <0 - 4> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:PPOther?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:PPOther <0 - 4> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:PPOther?
10ms Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut CLK10ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut?
20ms Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut CLK20ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut CLK20ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut?
307.2 Khz Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut CLK307khz [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut?
40ms Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut CLK40ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut?
4.8 Khz Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut CLK4khz [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut?
5ms Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut CLK5ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut?
80ms Clock	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut CLK80ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DCOut?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut CLK80ms [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DCOut?
Adjust Code Domain Power	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:PADJust EQUAL SCALE [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:PADJust EQUAL SCALE
APCO 25 C4FM	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTer AC4Fm [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTer?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTer AC4Fm [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTer?
BBG Data Clock Ext Int	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:BBCLock INT[1] EXT[1] [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:BBCLock?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BBCLock INT[1] EXT[1] [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BBCLock?



**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>CDMA2000 Off On</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:STATe]?
CDMA Freq	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYnc:SETup:CFRequency <0 - 2047> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYnc:SETup:CFRequency?
<b>Channel State Off On (F-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe]?
<b>Channel State Off On (F-PCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe]?
<b>Channel State Off On (F-PICH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICH[:STATe]?
<b>Channel State Off On (F-SCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2[:STATe]?
<b>Channel State Off On (F-SYNCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYnc[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYnc[:STATe]?
<b>Channel State Off On (OCNS)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS[:STATe]?
<b>Channel State Off On (QPCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH[:STATe]?
<b>Channel State Off On (R-ACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH[:STATe]?
<b>Channel State Off On (R-CCCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh[:STATe]?
<b>Channel State Off On (R-DCCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh[:STATe]?
<b>Channel State Off On (R-EACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH[:STATe]?
<b>Channel State Off On (R-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH[:STATe] ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH[:STATe]?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>Channel State Off On (R-PICH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICH[:STATe] ON OFF 1 0 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICH[:STATe]?
<b>Channel State Off On (R-SCH)</b> <b>(R-SCH, RC1-2)</b> <b>(R-SCH1, RC3-4)</b> <b>(R-SCH2, RC3-4)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH[:STATe] ON OFF 1 0 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH[:STATe]? [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1[:STATe] ON {OFF} 1 0 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1[:STATe]? [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2[:STATe] ON {OFF} 1 0 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2[:STATe]?
<b>Chip Clock</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DCOut CCLK [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DCOut? [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DCOut CCLK [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DCOut?
Chip Rate	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:CRATe <50 cps - 1.3 Mcps> [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:CRATe? [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:CRATe <50 cps - 1.3 Mcps> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:CRATe?
<b>Coded REACH</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT REACHcoded [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
<b>Coded RCCCH</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT RCCChcoded [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
<b>Coded RDCCH</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT RDCChcoded [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
<b>Coded RFCH</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT RFCHcoded [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
<b>Coded RSCH</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT RSCHcoded [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
Config Change	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:CCI <0 - 3> [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:CCI?
Data <b>(F-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA PN9 PN15 FIX4  "<file name>" EXT [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA?
Data <b>(F-PCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:DATA DEFault  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:DATA?
Data <b>(F-SCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA PN9 PN15  FIX4 "<file name>" EXT [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Data (R-ACH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA?
Data (R-CCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA?
Data (R-DCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA?
Data (R-EACH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA?
Data (R-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA?
Data (R-SCH)  (R-SCH, RC1-2) (R-SCH1, RC3-4) (R-SCH2, RC3-4)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA PN9 PN15 FIX4  "<file name>" [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA?
Data Clk Out	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DCOut CCLK CLK20ms  CLK80ms CLK4khz CLK307khz [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DCOut?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DCOut CCLK CLK5ms  CLK10ms CLK20ms CLK40ms CLK80ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DCOut?
Data Out	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:DOUT PCRamp D80Trigger [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:DOUT?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DOUT LCODE IOUT QOUT [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DOUT?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT LCODE  PILot RSCHcoded RDCChcoded RFCHcoded RCCChcoded REACHcoded ZI ZQ [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
Data Rate (F-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup: RATE <RC dependent:1.2, 1.5, 1.8, 2.4, 2.7, 3.6, 4.8, 7.2, 9.6, or 14.4kbps> [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:RATE?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Data Rate (F-PCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:RATE 4.8kbps 9.6kbps [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:RATE?
Data Rate (F-SCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:RATE <RC dependent: 19.2, 28.8, 38.4, 57.6, 76.8, 115.2, 153.6, 230.4, or 307.2kbps> [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:RATE?
Data Rate (QPCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:RATE 2.4kbps 4.8kbps [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:RATE?
Data Rate (R-ACH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:RATE?
Data Rate (R-CCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:RATE 9.6kbps 19.2kbps 38.4kbps [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:RATE?
Data Rate (R-DCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:RATE?
Data Rate (R-EACH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:RATE 9.6kbps 19.2kbps 38.4kbps [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:RATE?
Data Rate (R-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:RATE <RC dependent: 1.2, 1.5, 1.8, 2.4, 2.7, 3.6, 4.8, 7.2, 9.6, or 14.4kbps> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:RATE?
Data Rate (R-SCH)  (R-SCH, RC1-2)  (R-SCH1, RC3-4) (R-SCH2, RC3-4)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:RATE <RC dependent: 1.2, 1.8, 2.4, 3.6, 4.8, 7.2, 9.6, or 14.4kbps> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:RATE?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:RATE <RC and frame length dependent: 1.2, 1.35, 1.5, 1.8, 2.4, 2.7, 3.6, 4.8, 7.2, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 76.8, 115.2, 153.6, 230.4, or 307.2kbps> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:RATE?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:RATE <RC and frame length dependent: 1.2, 1.35, 1.5, 1.8, 2.4, 2.7, 3.6, 4.8, 7.2, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 76.8, 115.2, 153.6, 230.4, or 307.2kbps> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:RATE?
DAYLT	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:DAYLt <0- 1> [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:DAYLt?
Default Message	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:DATA DEFault [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:DATA?
Delayed 20ms Trigger	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT D20Trigger [:SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>Delayed 80ms Trigger</b>	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:DOUT D80Trigger [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:DOUT?  [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT D80Trigger [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT?
<b>Delayed Even Second</b>	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT DESecond [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT?  [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:EVENT DESecond [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:EVENT?  [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:EVENT DESecond [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:EVENT?
<b>Equal Powers</b>	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:PADJust EQUal [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:PADJust EQUal
Even Sec Delay	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:ESDelay <0.5 - 128.0> [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:ESDelay?  [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:ESDelay <0.5 - 128.0> [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:ESDelay?
<b>Even Second</b>	[:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:SSOut EVENsecond [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:SSOut?  [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:SSOut EVENsecond [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:SSOut?
<b>Event 1</b>	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT DESecond   D20Trigger   D80Trigger [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:EVENT?  [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:EVENT DESecond   PNSync [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:EVENT?  [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:EVENT DESecond   PNSync [:SOURCE]:RADio:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:EVENT?
<b>Ext (F-FCH)</b>	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA EXT [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA?
<b>Ext (F-SCH)</b>	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA EXT [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA?
Ext Cdma Freq	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup: ECFRequency <0 - 2047> [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:ECFRequency?
F-SYNCH Type	[:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:SType IS95 JSTD8   IS2000 [:SOURCE]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:SType?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>Falling</b>	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:TEDGE FALLing [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:TEDGE?
Filter	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER RNYQuist NYQuist GAUSSian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm "<User FIR>" [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER RNYQuist NYQuist GAUSSian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm "<User FIR>" [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER?
<b>Filter Alpha</b>	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER:ALPHA <0 - 1.0> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER:ALPHA?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER:ALPHA <0 - 1.0> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER:ALPHA?
<b>Filter BbT</b>	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER:BBT <0 - 1.0> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER:BBT?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER:BBT <0 - 1.0> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER:BBT?
<b>FIX4 (F-FCH)</b>	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA FIX4 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA?  [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA:FIX4 <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA:FIX4?
<b>FIX4 (F-SCH)</b>	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA FIX4 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA?  [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA:FIX4 <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA:FIX4?
<b>FIX4 (R-ACH)</b>	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RACH:SETup:DATA FIX4 [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RACH:SETup:DATA?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RACH:SETup:DATA:FIX4 <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RACH:SETup:DATA:FIX4?
<b>FIX4 (R-CCCH)</b>	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RCCCh:SETup:DATA FIX4 [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RCCCh:SETup:DATA?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RCCCh:SETup:DATA:FIX4 <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RCCCh:SETup:DATA:FIX4?
<b>FIX4 (R-DCCH)</b>	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETup:DATA FIX4 [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETup:DATA?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETup:DATA:FIX4 <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETup:DATA:FIX4?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>FIX4</b> <b>(R-EACH)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA FIX4 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA:FIX4 <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA:FIX4?
<b>FIX4</b> <b>(R-FCH)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA FIX4 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA:FIX4 <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA:FIX4?
<b>FIX4</b> <b>(R-SCH)</b>  <b>(R-SCH, RC1-2)</b>  <b>(R-SCH1, RC3-4)</b> <b>(R-SCH2, RC3-4)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA FIX4 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA FIX4 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA FIX4 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA:FIX4 <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA:FIX4?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA:FIX4 <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA:FIX4?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA:FIX4 <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA:FIX4?
Frame Length <b>R-ACH</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:FLENgth?
Frame Length <b>(R-CCCH)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:FLENgth 5ms 10ms 20ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:FLENgth?
Frame Length <b>(R-DCCH)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:FLENgth 5ms 20ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:FLENgth?
Frame Length <b>(R-EACH)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:FLENgth 5ms 10ms 20ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:FLENgth?
Frame Length <b>(R-FCH)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:FLENgth 5ms 20ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:FLENgth?
Frame Length <b>(R-SCH)</b>  <b>(R-SCH, RC1-2)</b>  <b>(R-SCH1, RC3-4)</b> <b>(R-SCH2, RC3-4)</b>	[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:FLENgth? [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:FLENgth 20ms 40ms 80ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:FLENgth?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:FLENgth 20ms 40ms 80ms [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:FLENgth?
Frame Offset <b>(F-FCH)</b>	[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:FOFFset <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:FOFFset?
Frame Offset <b>(F-SCH)</b>	[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:FOFFset <0 - 15> [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:FOFFset?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Frame Offset (R-ACH)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RACH:SETUP:FOFFset <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RACH:SETUP:FOFFset?
Frame Offset (R-CCCH)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RCCCh:SETUP:FOFFset <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RCCCh:SETUP:FOFFset?
Frame Offset (R-DCCH)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETUP:FOFFset <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETUP:FOFFset?
Frame Offset (R-EACH)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:FOFFset <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETUP:FOFFset?
Frame Offset (R-FCH)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RFCH:SETUP:FOFFset <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RFCH:SETUP:FOFFset?
Frame Offset (R-SCH)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH:SETUP:FOFFset <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH:SETUP:FOFFset?
(R-SCH, RC1-2)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH1:SETUP:FOFFset <0 - 63> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH1:SETUP:FOFFset?
(R-SCH1, RC3-4)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH2:SETUP:FOFFset <0 - 63>
(R-SCH2, RC3-4)	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH2:SETUP:FOFFset?
Full	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETUP:GRATE FULL [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETUP:GRATE?
Gating Rate	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETUP:GRATE FULL HALF QUARTER [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETUP:GRATE?
Gaussian	[[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER GAUSSian [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTER?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER GAUSSian [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTER?
Half	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETUP:GRATE HALF [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETUP:GRATE?
I Out	[[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DOUT IOUT [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DOUT?
IQ Map Rotation Std. Rotated	[[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQRotation STANDARD ROTATED [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQRotation?
IQ Voltage Scale	[[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:SCALE <0 - -40dB> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:IQ:SCALE?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:SCALE <0 - -40dB> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:IQ:SCALE?
IS2000	[[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETUP:STYPe IS2000 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETUP:STYPe?
IS95	[[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETUP:STYPe IS95 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNc:SETUP:STYPe?



**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>IS-95</b>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer IS95 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer IS95 [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?</pre>
<b>IS-95 Mod</b>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer IS95_MOD [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer IS95_MOD [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?</pre>
<b>IS-95 MOD w/EQ</b>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer IS95_MOD_EQ [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer IS95_MOD_EQ [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?</pre>
<b>IS-95 w/EQ</b>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer IS95_EQ [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?  [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer IS95_EQ [:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?</pre>
<b>JSTD8</b>	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYnc:SETup:STYPe JSTD8 [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYnc:SETup:STYPe?</pre>
LC Mask (F-FCH)	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask: ESN &lt;0 - 0xFFFFFFFF&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask:ESN?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask: HEADer &lt;0 - 0x3FF&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:LCMask:HEADer?</pre>
LC Mask (F-PCH)	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask: F1 &lt;0 - 0x1FFF&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F1?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F2 &lt;0 - 0x1F&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F2?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask: F3 &lt;0 - 0xFFF&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:LCMask:F3?</pre>
LC Mask (F-SCH)	<pre>[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:LCMask?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:LCMask: ESN &lt;0 - 0xFFFFFFFF&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:LCMask:ESN?  [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:LCMask: HEADer &lt;0 - 0x3FF&gt; [:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:LCMask:HEADer?</pre>

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
LC Mask (Reverse Link)	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:LCMask <0 - 0x3FFFFFFFFF> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:LCMask?
LC State	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup: LCState <0 - 0x3FFFFFFFFF> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:LCState?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:LCState <0 - 0x3FFFFFFFFF> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:LCState?
Link Forward Reverse	[:SOURCE]:RADIO:CDMA2000[:BBG]:LINK FORWARD REVERSE [:SOURCE]:RADIO:CDMA2000[:BBG]:LINK?
Long Code	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DOUT LCODE [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:DOUT?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DOUT LCODE [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DOUT?
Long Code Sync	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:SSOut LCSync [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC12:SSOut?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:SSOut LCSync [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:SSOut?
LP_SEC	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:LPsec <0 - 255> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:LPsec?
LTM_OFF	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:LTMoff <0 - 63> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:LTMoff?
MIN_P_REV	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:MPREV <0 - 255> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:MPREV?
Msg Type	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:MSGType <0 - 255> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:MSGType?
NID	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:NID <0 - 65535> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:NID?
Nyquist	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTer NYQuist [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTer?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTer NYQuist [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTer?
Optimize FIR For EVM ACP	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTer:CHANnel EVM ACP [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FILTer:CHANnel?  [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTer:CHANnel EVM ACP [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:FILTer:CHANnel?
P Puncturing	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:PPUNcture ON OFF 1 0 [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:PPUNcture?
P_REV	[:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:PREV <0 - 255> [:SOURCE]:RADIO:CDMA2000[:BBG][:FORWARD]:FSYNC:SETup:PREV?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Paging Indicator	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:PI <0 - 383> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:PI?
<b>PC Ramp</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:DOUT PCRamp [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:BNCMux:DOUT?
PCB Data	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICh:SETup:PCB <0 - 0xFFFF> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICh:SETup:PCB?
PCntrl (Up/Dn)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:PRAMP <1 - 80> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:PRAMP?
<b>Phase Polarity Normal Invert</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:POLarity[:ALL] NORMAL INVerted [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:POLarity[:ALL]?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:POLarity[:ALL] NORMAL INVerted [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:POLarity[:ALL]?
<b>Pilot</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT PILot [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:DOUT?
<b>PN15 (F-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA?
<b>PN15 (F-SCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA?
<b>PN15 (R-ACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA?
<b>PN15 (R-CCCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA?
<b>PN15 (R-DCCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA?
<b>PN15 (R-EACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA?
<b>PN15 (R-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA?
<b>PN15 (R-SCH)</b>  (R-SCH, RC1-2)  (R-SCH1, RC3-4) (R-SCH2, RC3-4)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA PN15 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA?
<b>PN9 (F-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:DATA?
<b>PN9 (F-SCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:DATA?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>PN9 (R-ACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA?
<b>PN9 (R-CCCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA?
<b>PN9 (R-DCCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA?
<b>PN9 (R-EACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA?
<b>PN9 (R-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA?
<b>PN9 (R-SCH)</b>  <b>(R-SCH, RC1-2)</b>  <b>(R-SCH1, RC3-4)</b> <b>(R-SCH2, RC3-4)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA PN9 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA?
PN Offset	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPICH:SETup:PNOffset <0 - 511> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPICH:SETup:PNOffset?
<b>PN Sync</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:EVENT PNSync [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:EVENT?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:EVENT PNSync [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:EVENT?
Power <b>(F-FCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:POWER?
Power <b>(F-PCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:POWER?
Power <b>(F-PICH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPICH:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPICH:SETup:POWER?
Power <b>(F-SCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:POWER?
Power <b>(F-SYNCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYNc:SETup:POWER?
Power <b>(OCNS)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:OCNS:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:OCNS:SETup:POWER?
Power <b>(QPCH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:POWER?
Power <b>(R-ACH)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:POWER <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:POWER?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Power (R-CCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:POWer?
Power (R-DCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:POWer?
Power (R-EACH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:POWer?
Power (R-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:POWer?
Power (R-PICH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICH:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICH:SETup:POWer?
Power (R-SCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:POWer?
(R-SCH, RC1-2)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:POWer?
(R-SCH1, RC3-4) (R-SCH2, RC3-4)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:POWer <0 - -40dB> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:POWer?
PRAT	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:PRATe <0 - 3> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:PRATe?
QOF (F-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:QOF <0 - 3> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:QOF?
QOF (F-SCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:QOF <0 - 3> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:QOF?
Q Out - no 1/2 Chip Delay	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DOUT QOUT [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:DOUT?
Quarter	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICH:SETup:GRATE QUARter [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RPICH:SETup:GRATE?
Radio Config (F-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:RCONfig <1 - 5> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:RCONfig?
Radio Config (F-SCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:RCONfig <3 - 5> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:RCONfig?
Radio Config (Reverse Link)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCONfig <1 - 4> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCONfig?
Rectangle	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FILTer RECTangle [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FILTer?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer RECTangle [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?
RESERVED	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:RESERVED?
Rising	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:TEDGE RISing [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:TEDGE?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
<b>Root Nyquist</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer RNYQuist [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer RNYQuist [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?
<b>Scale to 0dB</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:PADJust SCALE [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:PADJust SCALE
<b>Select File (F-FCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:SETup:DATA?
<b>Select File (F-PCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:SETup:DATA?
<b>Select File (F-SCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1] 2:SETup:DATA?
<b>Select File (R-ACH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RACH:SETup:DATA?
<b>Select File (R-CCCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:DATA?
<b>Select File (R-DCCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RDCCh:SETup:DATA?
<b>Select File (R-EACH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:REACH:SETup:DATA?
<b>Select File (R-FCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RFCH:SETup:DATA?
<b>Select File (R-SCH Data)</b>	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH:SETup:DATA?
(R-SCH, RC1-2)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:DATA?
(R-SCH1, RC3-4) (R-SCH2, RC3-4)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA "<file name>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:DATA?
<b>Select File (Filter)</b>	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer "<User FIR>" [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer "<User FIR>" [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?
SID	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:SID <0 - 32767> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SETup:SID?
Spread Rate	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWard]:SPReading:RATE?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:SPReading:RATE?

**Table 6-1. Mode – cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Symbol Sync Out	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:SSOut EVENsecond  LCSync [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC12:SSOut?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:SSOut EVENsecond  LCSync [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:BNCMux:RC34:SSOut?
SYS_TIME	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup: SYSTime <0 - 0xFFFFFFFF> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:SYSTime?
Trigger Advance	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:TADVance <0 - 2457599> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:TADVance?
Trigger Edge	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:TEDGE RISing FALLing [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:TEDGE?
Turbo Coding Off On	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:TCODE ON OFF 1 0 [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:TCODE?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:TCODE ON {OFF} 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH1:SETup:TCODE?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:TCODE ON {OFF} 1 0 [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RSCH2:SETup:TCODE?
Voltage Other ESG	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:IQ:TVOther <0 - 4V> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:IQ:TVOther?  [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:IQ:TVOther <0 - 4V> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:IQ:TVOther?
Voltage This ESG	[ :SOURce]:RADio:CDMA2000[:BBG]:FORWARD:IQ:TVOLTage? [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:IQ:TVOLTage?
Walsh (F-FCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:WALSh <0 - 63> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FFCH:SETup:WALSh?
Walsh (F-PCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:WALSh <0 - 63> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FPCH:SETup:WALSh?
Walsh (F-SCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:WALSh <0 - 63> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSCH[1] 2:SETup:WALSh?
Walsh (F-SYNCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:WALSh <0 - 63> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:FSYnc:SETup:WALSh?
Walsh (OCNS)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:OCNS:SETup:WALSh <0 - 63> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:OCNS:SETup:WALSh?
Walsh (QPCH)	[ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:WALSh <0 - 127> [ :SOURce]:RADio:CDMA2000[:BBG][:FORWARD]:QPCH:SETup:WALSh?
Walsh (R-CCCH)	[ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:WALSh <0 - 7> [ :SOURce]:RADio:CDMA2000[:BBG]:REVerse:RCCCh:SETup:WALSh?

**Table 6-1. Mode - cdma2000 Softkeys (Continued)**

Key or Data Field	SCPI Command
Walsh (R-DCCH)	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETup:WALSh <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RDCCh:SETup:WALSh?
Walsh (R-EACH)	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETup:WALSh <0 - 7> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:REACH:SETup:WALSh?
Walsh (R-FCH)	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RFCH:SETup:WALSh <0 - 15> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RFCH:SETup:WALSh?
Walsh R-PICH	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RPICH:SETup:WALSh?
Walsh (R-SCH) (R-SCH1, RC3-4) (R-SCH2, RC3-4)	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH1:SETup:WALSh <0 - 7> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH1:SETup:WALSh? [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH2:SETup:WALSh <0 - 7> [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:RSCH2:SETup:WALSh?
<b>Zi</b>	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DOUT ZI [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DOUT?
<b>Zq</b>	[:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DOUT ZQ [:SOURCE]:RADIO:CDMA2000[:BBG]:REVERSE:BNCMux:RC34:DOUT?



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