

User's and Programming Guide
HP ESG-D Series Option 100 Signal Generators
W-CDMA (Rev. 1.0-1.2) Personality



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1 The W-CDMA (Rev. 1.0-1.2) Personality

This guide provides information specific to the Option 100 W-CDMA (Revision 1.0–1.2) personality.

NOTE	This option requires the installation of Option UND, Dual Arbitrary Waveform Generator. Refer to the Option UND user's and programming guide for information. (HP part number E4400-90249).
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Overview

This section contains an overview of the W-CDMA (Revision 1.0–1.2) personality.

Option 100 W-CDMA (Revision 1.0–1.2)

The HP ESG-D Series Option 100 signal generator is a multichannel, wideband code division multiple access (W-CDMA) stimulus intended for base station and mobile testing. Option 100 enables you to generate forward and reverse link signals consistent with the developing W-CDMA (Revision 1.0-1.2) system specifications. User-defined custom signals can be created using a simple table-based channel editor.

Option 100 includes:

- multichannel W-CDMA forward and reverse link signals
- OCQPSK (HPSK) spreading/modulation type used in reverse link
- baseband clipping; clip the peak-to-average of signals prior to FIR filtering
- control over power level of TFCI, TPC, and pilot symbols relative to data
- transmitted chip rates of 4.096, 8.192, and 16.384 Mcps
- select from predefined W-CDMA channels or use the table editor to fully configure a W-CDMA signal waveform per your requirements

NOTE Specifications for Option 100 are included in Chapter 8 of the *HP ESG and HP ESG-D Series Signal Generators User's Guide*.

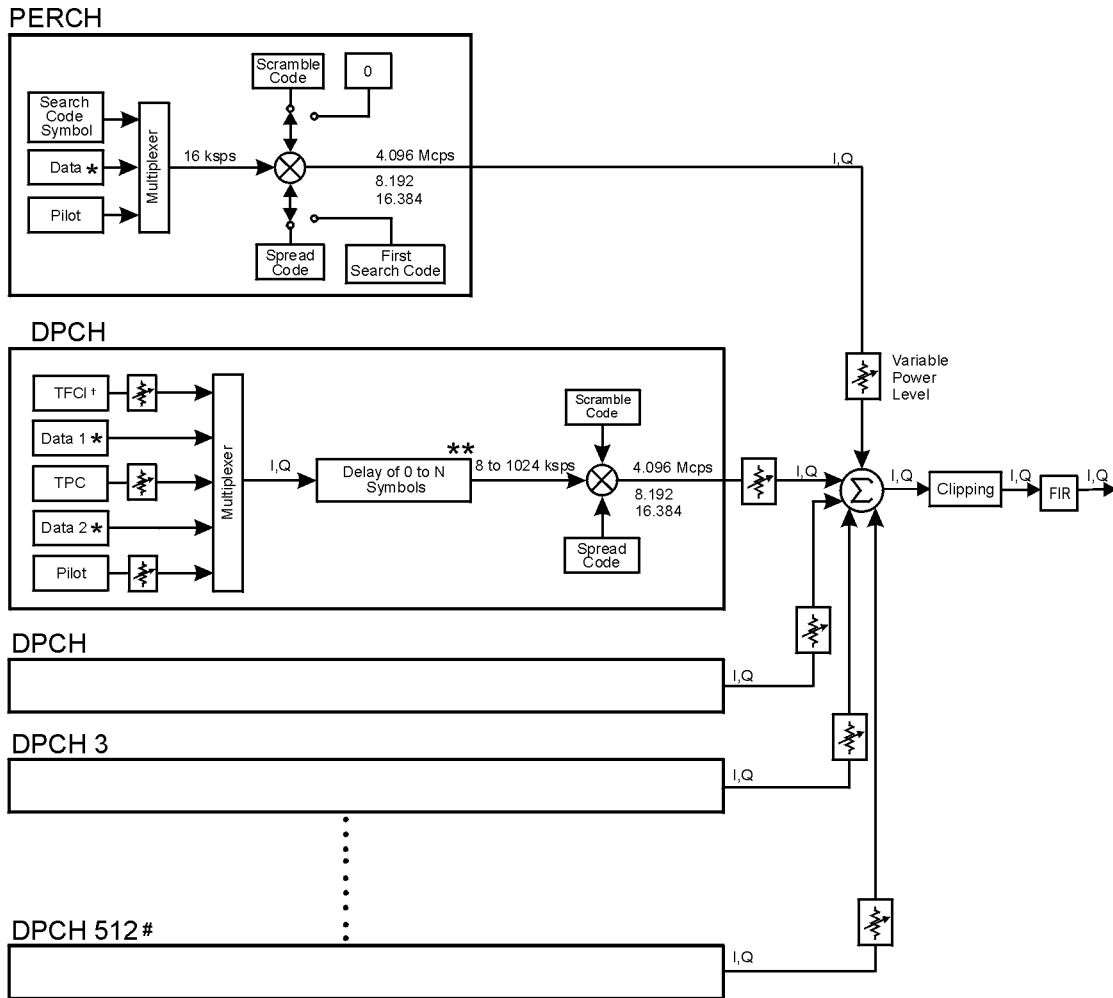
Revision Numbers

The firmware personality of the Option 100 signal generator is based on continually developing W-CDMA international standards. Therefore, the firmware must be upgraded periodically to stay current with these standards. For identification purposes, a revision number is assigned to each release of the Option 100 personality. The revision number appears in softkey menus, status displays, and this guide. This guide describes the features associated with *revision 1.0-1.2* of the Option 100 W-CDMA personality.

Block Diagrams

[Figure 1-1](#) and [Figure 1-2](#) show the forward and reverse link channel structures supported by Option 100.

Figure 1-1 Option 100 Forward Link Channel Structure



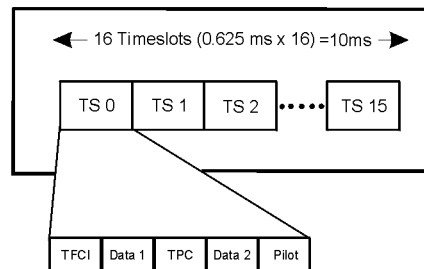
Maximum 512 Traffic Channels

** Range of symbol offsets depends on the channel symbol rate.

† Transmission can be configured with or without TFCI

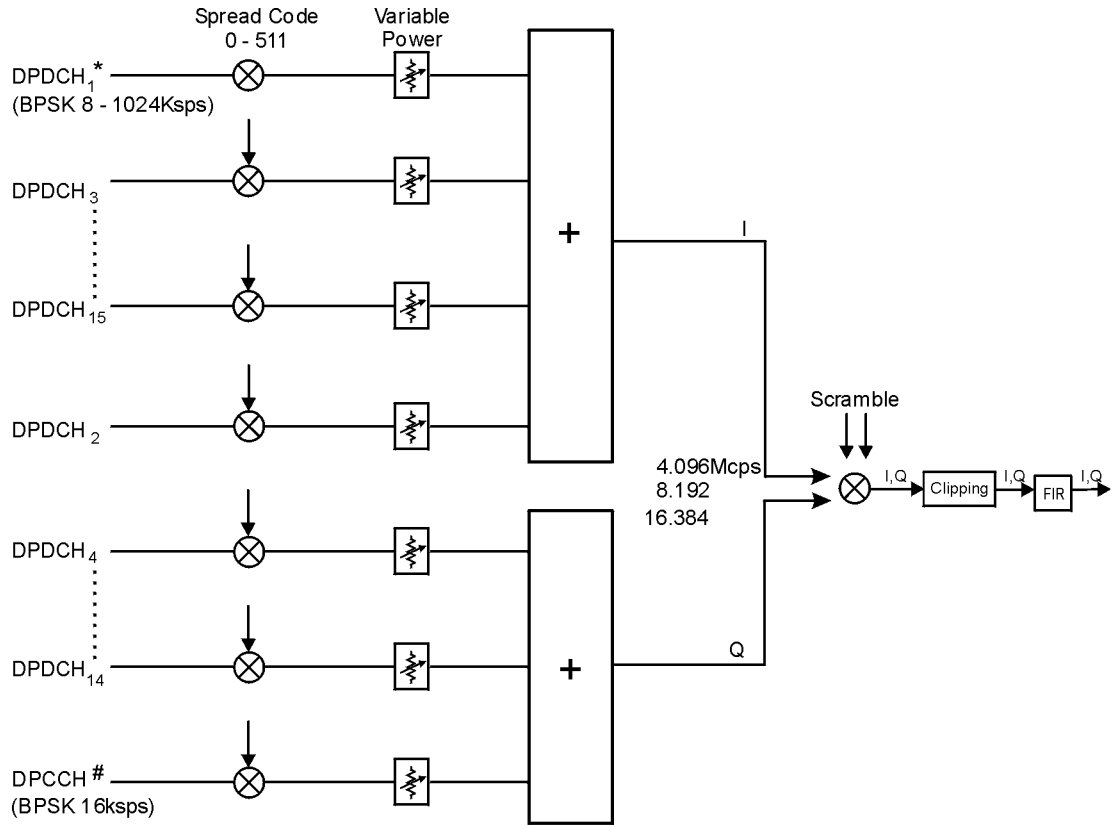
* Random data or 8 bit repeating pattern

Frame structure for DPCH

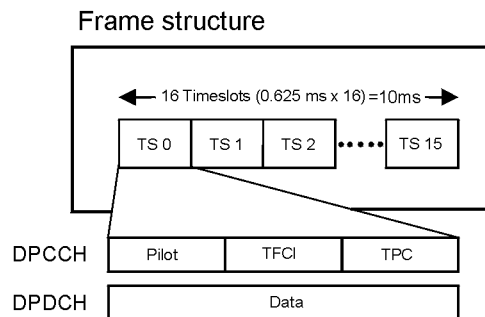


pk721b

Figure 1-2 Option 100 Reverse Link Channel Structure



* User Data: Random or 8bit Repeating Pattern
 # TFCI & TPC data fields may be edited.
 TFC field may be turned off.



pk730b

2 Using Functions

This chapter contains instructions for using the features associated with the Option 100, W-CDMA (Rev. 1.0-1.2) personality.

Table Editor Basics

Option 100 provides several table editors that enable you to:

- modify W-CDMA forward link channel configurations (for details, see [page 2-9](#))
- modify W-CDMA reverse link channel configurations (for details, see [page 2-15](#))
- create a user-defined FIR filter (for details, see [page 2-26](#))
- modify a user-defined FIR filter (for details, see [page 2-31](#))

While each of these table editors performs a different function, they are all used in a similar manner, and most of the table editors have several editing softkeys in common.

Common Edit Functions

Edit Item	Enables you to use the front panel knob and arrow keys to edit the value of a selected entry. After highlighting the value you want to edit, press this softkey.
Insert Row	Inserts a row for data above the currently selected row.
Delete Row	Deletes the currently selected row of data.
Goto Row	Displays a new page of softkeys so that you can quickly move to the first, middle, or last row of data. This is especially helpful in a large table, or when using the filter table editor mirror function.
Load Default FIR	Enables you to reset factory default values for a FIR filter.
Load/Store	Displays a new page of softkeys that enables you to load data from a stored file, save data to a file, or delete a stored file.
Delete All Rows	Clears all data from a table.

CAUTION There is no “undo” command. Once you delete data from a table, you cannot retrieve it.

Using W-CDMA (Rev. 1.0-1.2)

This chapter describes how to set up a waveform using predefined and user-defined channels.

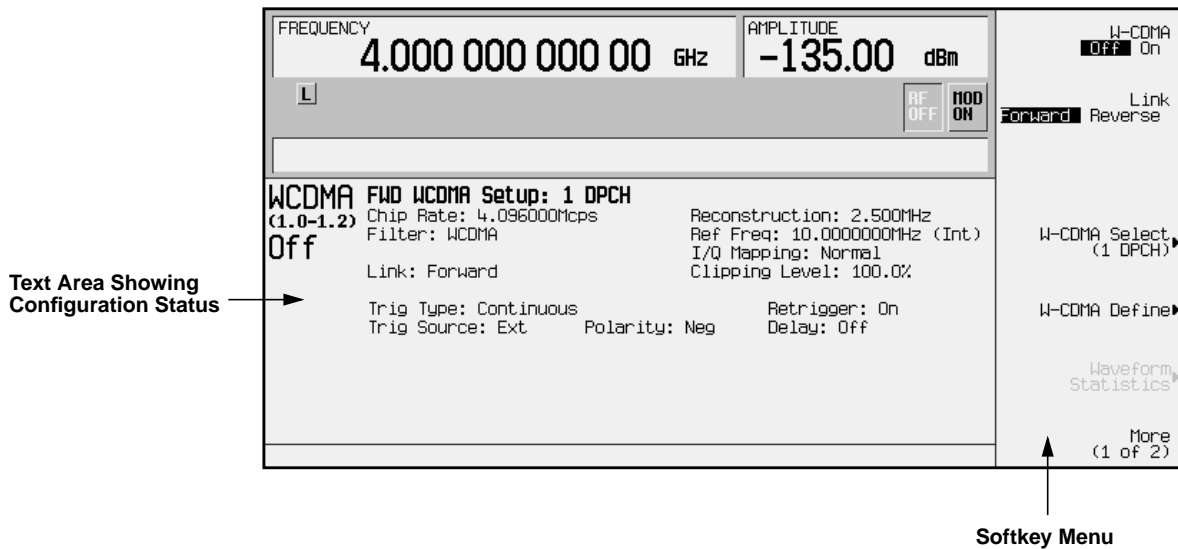
You will learn how to perform the following:

- select channels
- modify channels
- activate the modulation and the RF output
- create filters
- modify filters

Accessing the W-CDMA Menu

Perform the following procedure to access the W-CDMA personality.

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev 1.0-1.2)** to display the W-CDMA menu. The first page of W-CDMA softkeys is displayed on the right side of the display. The center text area of the display shows the status of W-CDMA configuration. These characteristics are immediately updated when you modify them in the softkey menus.



Selecting Predefined Channel Configurations

The HP ESG-D Option 100 signal generator contains predefined channel setups for both forward and reverse link waveform generation.

Forward Link Predefined Channel Configurations

There are six predefined channel configurations for forward link:

- 1 DPCH
- 3 DPCH
- Perch
- Perch plus 1 DPCH
- Perch plus 3 DPCH
- Perch plus 50 DPCH

Reverse Link Predefined Channel Configurations

There are four predefined channel configurations for forward link:

- DPCCH
- DPCCH plus 1 DPDCH
- DPCCH plus 2 DPDCH
- DPCCH plus 3 DPDCH

CAUTION

Unless previously saved to the signal generator's memory catalog, modifications made to predefined channel configurations (additional channels, user-defined channel values, etc.) are lost when changes are made to link direction.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

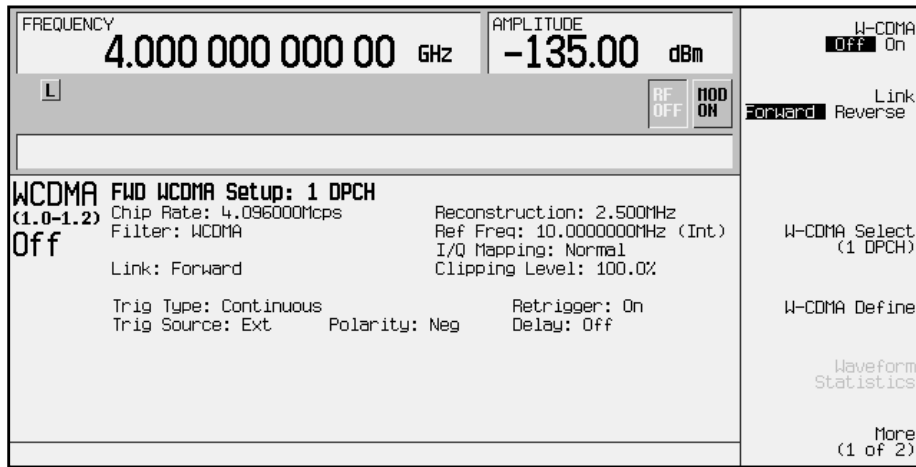
After an instrument preset, the default predefined channel configuration is one dedicated physical channel (1 DPCH) in the forward link mode. Predefined channel configurations can be used as defined, or modified using the channel table editor. See [“Modifying Forward Link Channel Configurations”](#) on page 2-9 for more information.

The following procedures explain how to select predefined channel setups for both forward and reverse link waveform configurations.

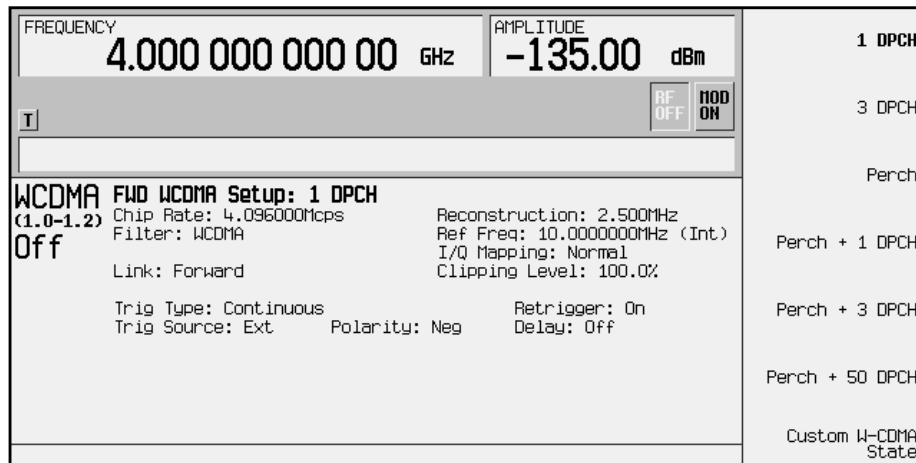
Selecting a Forward Link Predefined Channel Configuration

Perform the following procedure to select forward link predefined channel configurations.

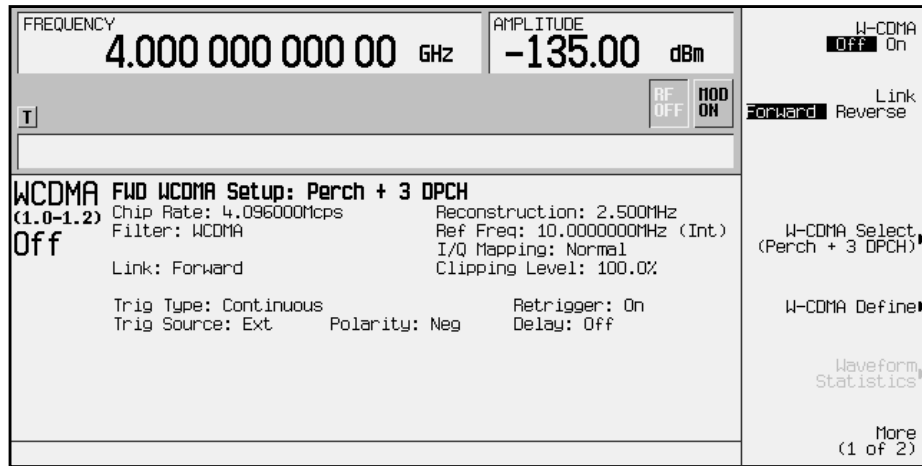
1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev 1.0-1.2)** to display the W-CDMA menu. Notice that the default predefined channel selection for forward link (**1 DPCH**) appears underneath **W-CDMA Select** in the softkey menu. The text area displays **FWD WCDMA Setup: 1 DPCH** as the current configuration, as shown in the following figure.



5. Press **W-CDMA Select** to display the W-CDMA Setup selection menu for forward link, as shown in the following figure.



- Press **Perch + 3 DPCH** to select perch plus three dedicated physical channels. (Perch + 3 DPCH) appears under **W-CDMA Select** in the softkey menu. The text area displays **FWD WCDMA Setup: Perch + 3 DPCH** as the current configuration, as shown in the following figure.

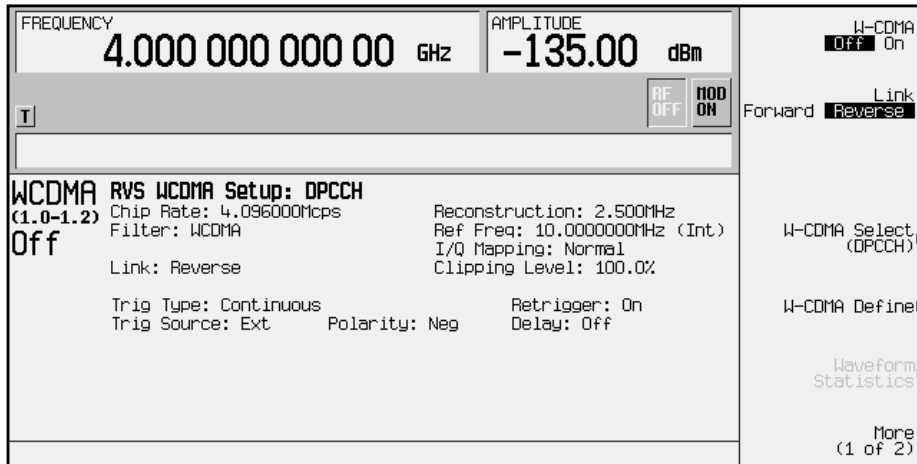


Selecting a Reverse Link Predefined Channel Configuration

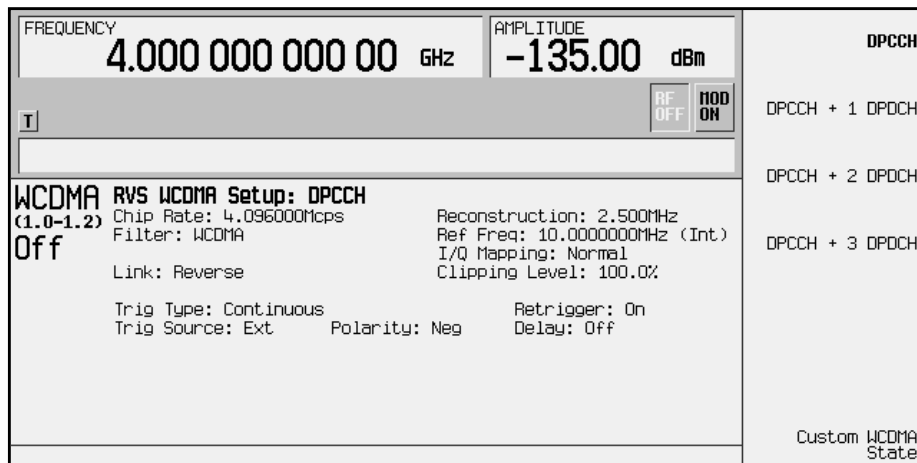
Perform the following procedure to select reverse link predefined channel configurations.

- Press **Preset** to set the signal generator to normal preset conditions.
- Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
- Press **CDMA Formats**.
- Press **W-CDMA (Rev 1.0-1.2)** to display the W-CDMA menu.

- Press **Link Forward Reverse** until **Reverse** is highlighted. The default predefined channel selection for reverse link (DPCCH) appears beneath **W-CDMA Select** in the softkey menu. The text area displays **RVS WCDMA Setup: DPCCH** as the current configuration, as shown in the following figure.



- Press **W-CDMA Select** to display the W-CDMA Setup selection menu for reverse link, as shown in the following figure.



- Press **DPCCH + 3 DPDCH** to select a dedicated physical control channel plus three dedicated physical data channels. (DPCCH + 3 DPDCH) appears under **W-CDMA Select** in the softkey menu. The text area displays **RVS WCDMA Setup: DPCCH + 3 DPDCH** as the current configuration, as shown in the following figure.



Modifying Forward Link Channel Configurations

You can modify forward link channel configurations using the channel setup table editor. The following examples show you how to modify predefined channel setups for forward link waveform configurations. Refer to [“Table Editor Basics”](#) on page 2-2 for additional information about table editors.

CAUTION Unless previously saved to the signal generator’s memory catalog, modifications made to predefined channel configurations (additional channels, user-defined channel values, etc.) are lost when changes are made to link direction.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Inserting Additional Channels

The default forward link channel setup after a normal instrument preset is one dedicated physical channel (DPCH). The maximum number of forward link channels allowed in the channel table editor is 512.

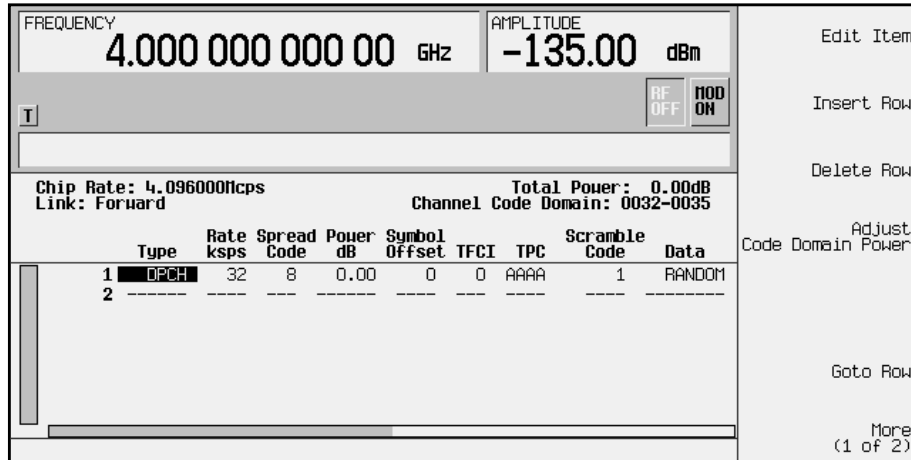
In the following sections, examples are provided for inserting DPCH and perch channels into the forward link configuration.

Inserting Additional DPCH Channels

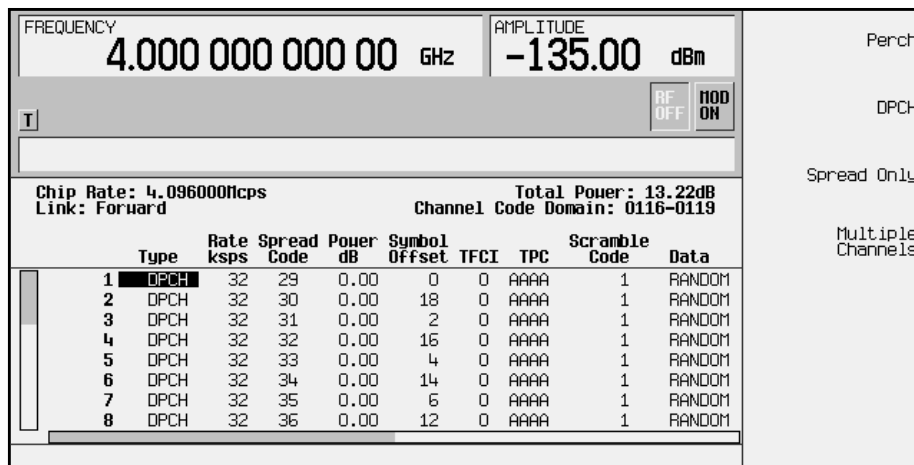
In this example, 20 additional DPCH channels are inserted into the default predefined forward link configuration.

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)** to display the W-CDMA menu.

- Press **W-CDMA Define, Edit Channel Setup** to display the channel table editor, as shown in the following figure. The horizontal scroll bar at the bottom of the screen indicates that there are more columns to the right of the **Data** column. Use the right arrow key to move the cursor to view the additional columns.



- Press **Insert Row, Multiple Channels, Channels** and enter **20**. Terminate the entry with the **Enter** softkey.
- Press **Done** to insert 20 additional DPCH channels. The channel table editor now contains the 20 additional channels, as shown in the following figure. Notice that the first page only displays channels one through eight. To see the additional channels, press **Return, Goto Row, Page Down**. In this example there are three pages. Press **Page Down** two times to view the last page.



- Press **Return** until the status screen appears. The text area displays **FWD WCDMA Setup:1 DPCH (Modified)** as the current configuration.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Inserting a Perch Channel

After a normal instrument preset, the W-CDMA default forward link setup consists of one DPCH channel. In this example, a perch channel is inserted before the DPCH channel.

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)** to display the W-CDMA menu.
5. Press **W-CDMA Define, Edit Channel Setup** to display the channel table editor, as shown in the following figure. Use the front panel knob or arrow keys to move the cursor to table row 1.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Edit Item	
L				RF OFF		MOD ON		Insert Row▶	
								Delete Row	
Chip Rate: 4.096000Mcps		Link: Forward		Total Power: 0.00dB		Channel Code Domain: 0032-0035		Adjust Code Domain Power▶	
	Type	Rate kspss	Spread Code	Power dB	Symbol Offset	TFCI	TPC	Scramble Code	Data
1	DPCH	32	8	0.00	0	0	AAAA	1	RANDOM
2									
								Goto Row▶	
								More (1 of 2)	

6. Press **Insert Row, Perch**. A perch channel is now inserted in the channel table editor, as shown in the following figure.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Perch	
T				RF OFF		MOD ON		DPCH▶	
								Spread Only▶	
Chip Rate: 4.096000Mcps		Link: Forward		Total Power: 3.01dB		Channel Code Domain: 0036-0039		Multiple Channels▶	
	Type	Rate kspss	Spread Code	Power dB	Symbol Offset	TFCI	TPC	Scramble Code	Data
1	Perch	32	9	0.00	N/A	N/A	N/A	1	RANDOM
2	DPCH	32	8	0.00	0	0	AAAA	1	RANDOM
3									

7. Press **Return** until the status screen appears. The text area displays **FWD WCDMA Setup: 1 DPCH (Modified)** as the current configuration.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Editing Forward Link Channel Values in the Table Editor

You can use the channel setup table editor to modify forward link configuration values in the following columns:

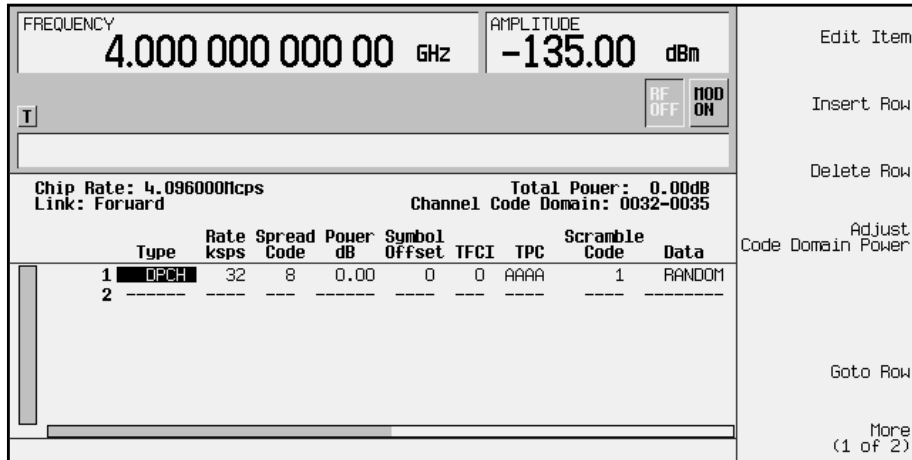
- Rate `ksps` - symbol rate in kilosymbols-per-second
- Spread Code
- Power `dB` - channel power in decibels
- Symbol Offset
- TFCI - transport format combination indicator
- TPC - transmit power control in hexadecimal
- Scramble Code
- Data - specific or random data
- TFCI Power - power offset in decibels
- TPC Power - power offset in decibels
- Pilot Power - power offset in decibels

Highlight the value you wish to change using the front panel arrows or knob, then enter the new value using the numeric keypad.

In the following example, you will edit the TPC, TFCI Power, TPC Power, and Pilot Power fields of the default predefined channel selection for forward link, which is one dedicated physical channel (1 DPCH).

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)** to display the W-CDMA menu. Notice that the default predefined channel selection for forward link is 1 DPCH.

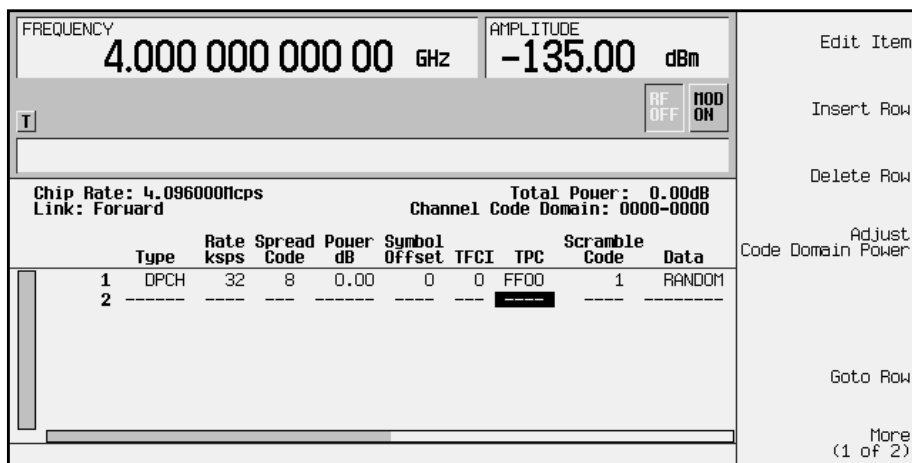
- Press **W-CDMA Define**, then **Edit Channel Setup** to display the channel table editor, as shown in the following figure.



- Use the right arrow key to highlight the **TPC** value. **AAAA** should be highlighted.

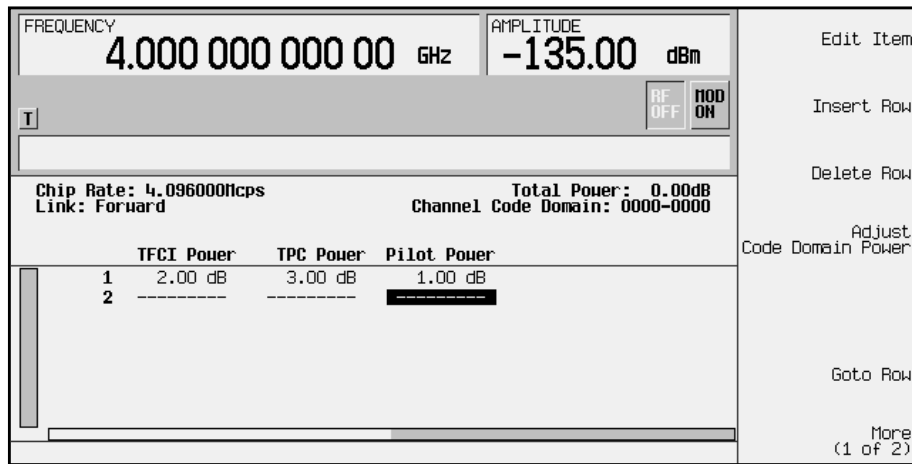
NOTE TPC values are entered as hexadecimal digits (0-9, A-F). For information on what these values represent, refer to [“Understanding TPC Values”](#) on page 4-5.

- Press **Edit Item** and enter **FF00** using the letter softkeys and numeric keypad. Then, terminate the entry with the **Enter** softkey. The **TPC** value has now been modified and the cursor has moved to the next row in the **TPC** column, as shown in the following figure.



- Use the right arrow key to move the cursor to the **TFCI Power**, **TPC Power**, and **Pilot Power** fields, which are currently hidden from view. (The horizontal scroll bar at the bottom of the screen indicates that there are columns to the right of the **Data** column.)

9. Use the arrow keys to highlight 0.00 dB in the TFCI Power field and press **Edit Item, 2, dB**. The TFCI power has now been offset by 2 dB and the cursor has moved to the next row in the TFCI Power column.
10. Use the arrow keys to highlight 0.00 dB in the TPC Power field and press **Edit Item, 3, dB**. The TPC power has now been offset by 3 dB and the cursor has moved to the next row in the TPC Power column.
11. Use the arrow keys to highlight 0.00 dB in the Pilot Power field and press **Edit Item, 1, dB**. The pilot power has now been offset by 1 dB and the cursor has moved to the next row in the Pilot Power column, as shown in the following figure.



NOTE For conceptual information on TFCI, TPC, and pilot power offsets, refer to [“Understanding TFCI, TPC, and Pilot Power Offsets”](#) on page 4-6.

12. Press **Return** until the status screen appears. The text area displays FWD WCDMA Setup: 1 DPCH (Modified) as the current configuration.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Modifying Reverse Link Channel Configurations

You can modify reverse link channel configurations using the channel setup table editor. The following examples show you how to modify predefined channel setups for reverse link waveform configurations. Refer to [“Table Editor Basics”](#) on page 2-2 for additional information about table editors.

CAUTION

Unless previously saved to the signal generator’s memory catalog, modifications made to predefined channel configurations (additional channels, user-defined channel values, etc.) are lost when changes are made to link direction.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Inserting Additional Channels

The default reverse link channel setup after a normal instrument preset is one dedicated physical control channel (DPCCH). The DPCCH channel always occupies row 1 in the table editor and is modulated as a Q component. Any additional channels inserted into the table editor are dedicated physical data channels (DPDCH). The first DPDCH channel occupies row 2 and is modulated with an I component. The remaining channels (row 3 and greater) can be modulated with either I or Q, but no two consecutive channels are allowed to have the same component. The maximum number of reverse link channels is 16.

The following example explains how to insert DPDCH channels into the reverse link configuration.

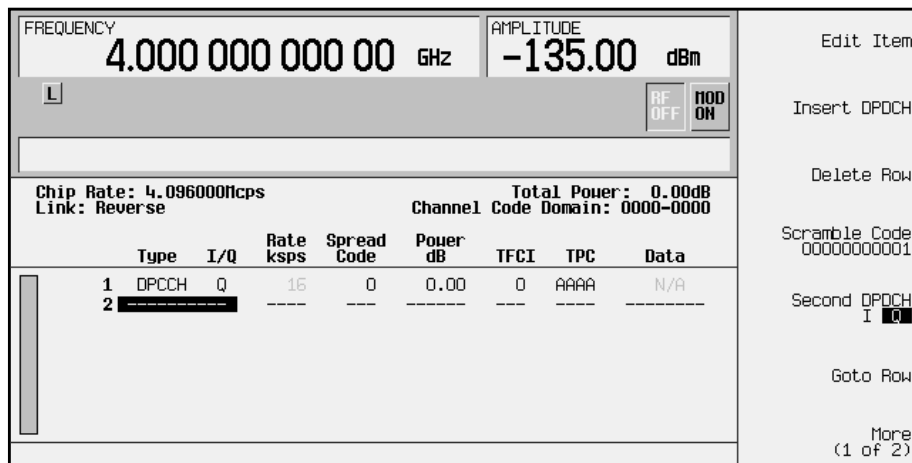
Inserting Additional DPDCH Channels

In this example, 15 additional DPDCH channels are inserted into the default predefined reverse link configuration.

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)** to display the W-CDMA menu.
5. Press **Link Forward Reverse** until **Reverse** is highlighted. The display reflects the change to reverse link mode. The text area displays **RVS WCDMA Setup: DPCCCH** as the current configuration, as shown in the following figure.



6. Press **W-CDMA Define, Edit Channel Setup** to display the channel table editor, as shown in the following figure. Use the arrow keys to move the cursor to table row 2.



- Press **Insert DPDCH**, **DPDCH Channels**. To enter the value, rotate the front panel knob, use the up and down arrow keys until the number 15 is displayed, or enter 15 using the numeric keypad. Terminate the entry with the **Enter** softkey.
- Press **Done** to insert 15 additional DPDCH channels. The channel table editor now contains the 15 additional channels, as shown in the following figure. Notice that the first page only displays channels one through eight. To see the additional channels, press **Goto Row**, **Page Down**.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Edit Item	
RF OFF		MOD ON		Insert DPDCH				Delete Row	
Chip Rate: 4.096000Mcps		Link: Reverse		Total Power: 12.04dB		Channel Code Domain: 0008-0015		Scramble Code 0000000001	
Type	I/Q	Rate ksp/s	Spread Code	Power dB	TFCI	TPC	Data	Second DPDCH I Q	
1	DPCCH Q	16	0	0.00	0	AAAA	N/A	Goto Row	
2	DPDCH I	64	1	0.00	N/A	N/A	RANDOM	More (1 of 2)	
3	DPDCH Q	64	2	0.00	N/A	N/A	RANDOM		
4	DPDCH I	64	3	0.00	N/A	N/A	RANDOM		
5	DPDCH Q	64	4	0.00	N/A	N/A	RANDOM		
6	DPDCH I	64	5	0.00	N/A	N/A	RANDOM		
7	DPDCH Q	64	6	0.00	N/A	N/A	RANDOM		
8	DPDCH I	64	7	0.00	N/A	N/A	RANDOM		

- Press **Second DPDCH I Q** until **I** is highlighted, as shown in the following figure. Notice that the I/Q setting for the second DPDCH channel (row 3) has changed from **Q** to **I**. Additionally, all subsequent channels have also switched I/Q settings.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Edit Item	
RF OFF		MOD ON		Insert DPDCH				Delete Row	
Chip Rate: 4.096000Mcps		Link: Reverse		Total Power: 12.04dB		Channel Code Domain: 0008-0015		Scramble Code 0000000001	
Type	I/Q	Rate ksp/s	Spread Code	Power dB	TFCI	TPC	Data	Second DPDCH I Q	
1	DPCCH Q	16	0	0.00	0	AAAA	N/A	Goto Row	
2	DPDCH I	64	1	0.00	N/A	N/A	RANDOM	More (1 of 2)	
3	DPDCH I	64	2	0.00	N/A	N/A	RANDOM		
4	DPDCH Q	64	3	0.00	N/A	N/A	RANDOM		
5	DPDCH I	64	4	0.00	N/A	N/A	RANDOM		
6	DPDCH Q	64	5	0.00	N/A	N/A	RANDOM		
7	DPDCH I	64	6	0.00	N/A	N/A	RANDOM		
8	DPDCH Q	64	7	0.00	N/A	N/A	RANDOM		

- Press **Return** until the status screen appears. The text area displays **RVS WCDMA Setup: DPCCH (Modified)** as the current configuration.

To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Editing Reverse Link Channel Values in the Table Editor

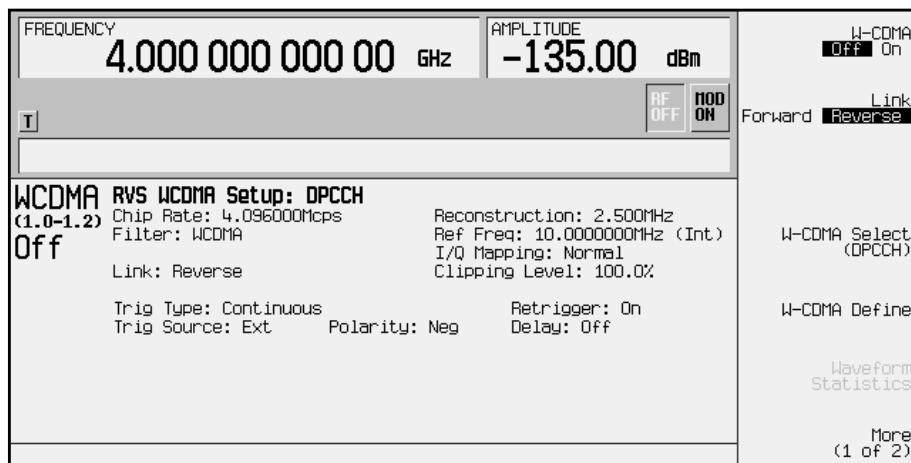
You can use the channel setup table editor to modify reverse link configuration values in the following columns:

- Rate `ksp/s` - symbol rate in kilosymbols-per-second
- Spread Code
- Power `dB` - channel power in decibels
- TFCI - transport format combination indicator
- TPC - transmit power control in hexadecimal
- Data - specific or random data

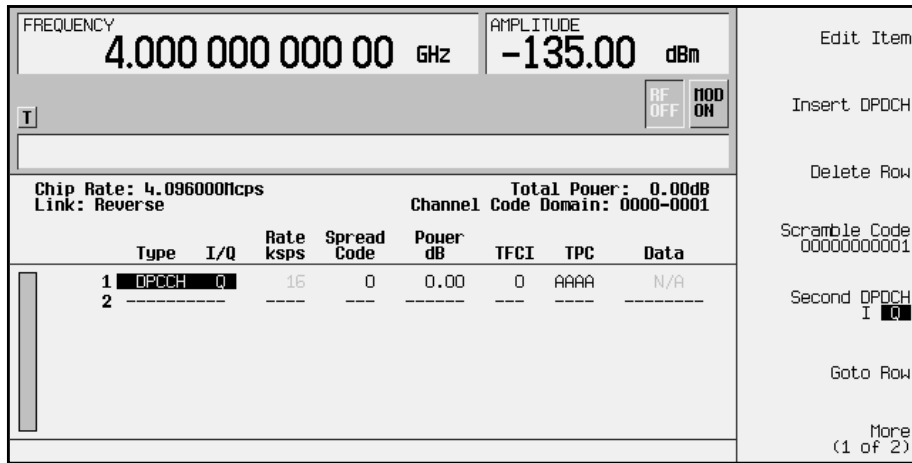
Highlight the value you wish to change using the front panel arrows or knob, then enter the new value using the numeric keypad.

In the following example, you will edit the `TPC` field of the default predefined channel selection for reverse link, which is one dedicated physical channel (1 DPCH).

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)** to display the W-CDMA menu.
5. Press **Link Forward Reverse** until **Reverse** is highlighted. The display reflects the change to reverse link mode. The text area displays `RVS WCDMA Setup: DPCCH` as the current configuration, as shown in the following figure.



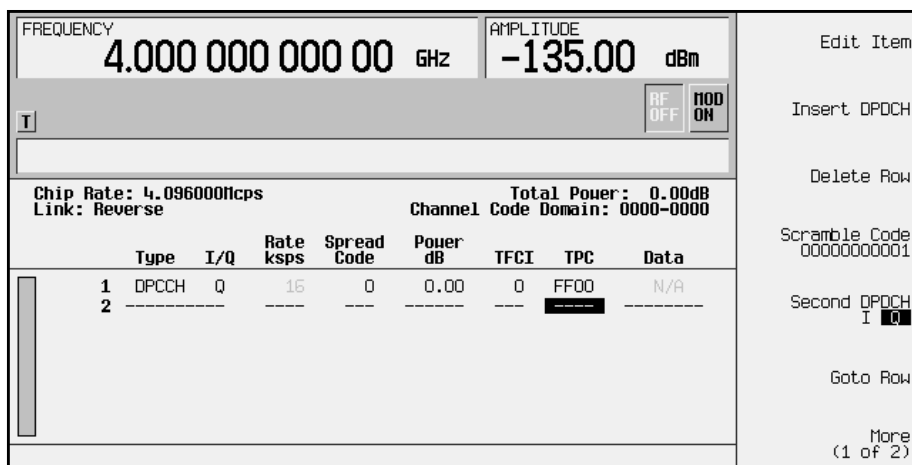
- Press **W-CDMA Define**, then **Edit Channel Setup** to display the channel table editor, as shown in the following figure.



- Use the right arrow key to highlight the **TPC** value. **AAAA** should be highlighted.

NOTE TPC values are entered as hexadecimal digits (0-9, A-F). For information on what these values represent, refer to [“Understanding TPC Values”](#) on page 4-5.

- Press **Edit Item** and enter **FF00** using the letter softkeys and numeric keypad. Then, terminate the entry with the **Enter** softkey. The **TPC** value has now been modified and the cursor has moved to the next row in the **TPC** column, as shown in the following figure.



- Press **Return** until the status screen appears. The text area displays **RVS WCDMA Setup: DPCCH (Modified)** as the current configuration.

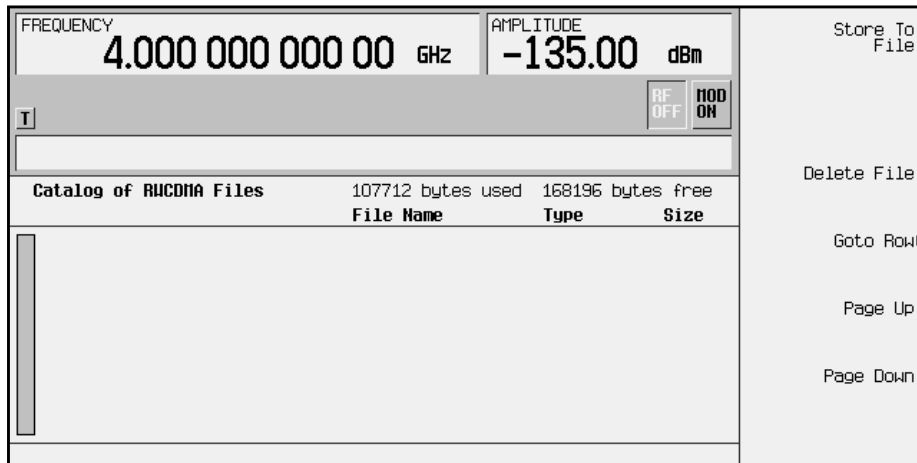
To store a custom W-CDMA state, see [“Storing a Custom W-CDMA State to Memory”](#) on page 2-20.

Storing a Custom W-CDMA State to Memory

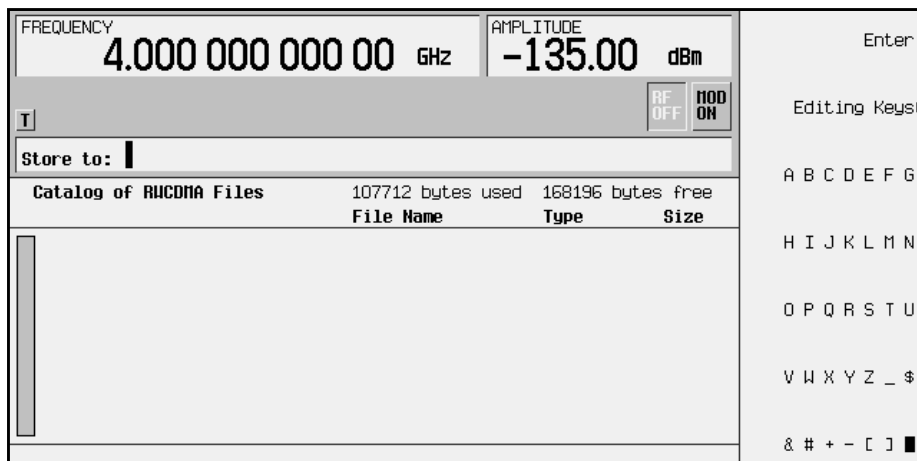
In this procedure, you will store the custom W-CDMA state created in the previous procedure. If you have not performed the previous procedure, turn to [“Editing Reverse Link Channel Values in the Table Editor”](#) on page 2-18 and complete this procedure before continuing.

Perform the following procedure to store the custom W-CDMA state to the signal generator’s memory catalog.

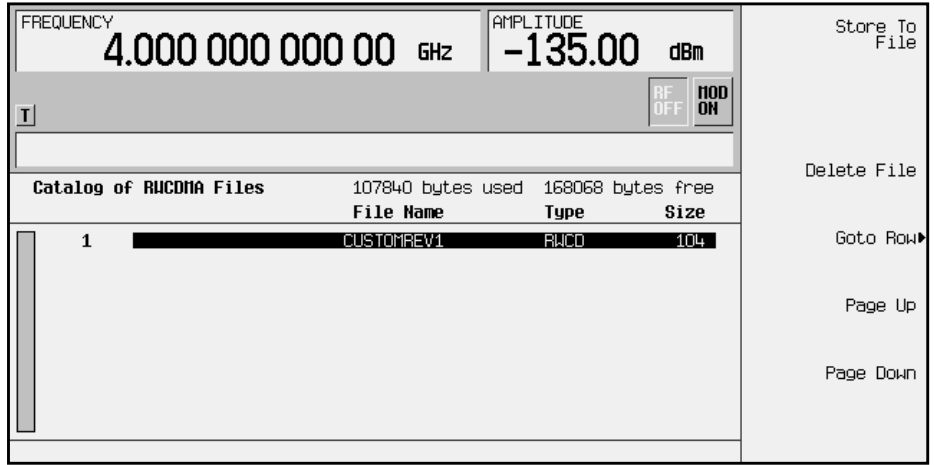
1. To store the custom W-CDMA state, press **Store Custom W-CDMA State**. This opens a menu that accesses the signal generator’s reverse W-CDMA (RWCDMA) memory catalog, as shown in the following figure.



2. To name the custom W-CDMA state, press **Store to File**. This opens a menu that allows you to name the custom W-CDMA state, as shown in the following figure.



- Using the alphabetic menu and the numeric keypad, enter the file name `CUSTOMREV1` and terminate your entry with the **Enter** key. Your custom W-CDMA state `CUSTOMREV1` is now saved to the reverse W-CDMA memory catalog, as shown.



Identifying and Resolving Code Domain Conflicts

The code domain space of each channel is defined by the symbol rate and spread code. Code domain conflicts can arise when two channels of different rates map to the same code domain space. If code domain conflicts are present when the waveform is turned on, the conflicting channels are still generated.

NOTE Although the examples in this section use the forward link channel configuration, the information also applies to reverse link.

Identifying Conflicts

The following illustration shows a code domain conflict between the dedicated physical channels in rows 5 and 6 with the dedicated physical channel in row 2.

FREQUENCY		AMPLITUDE									
4.000 000 000 00 GHz		-135.00 dBm								Edit Item	
										Insert Row▶	
										Delete Row	
										Adjust Code Domain Power▶	
Chip Rate: 4.096000Mcps		Total Power: 8.45dB		Link: Forward		Channel Code Domain: 0024-0031				Goto Row▶	
Domain Conflict	Type	Rate ksp/s	Spread Code	Power dB	Symbol Offset	TFCI	TPC	Scramble Code	Data		
1	DPCH	16	2	0.00	0	0	AAAA	1	RANDOM		
2	DPCH	64	3	0.00	18	0	AAAA	1	RANDOM		
3	DPCH	32	4	0.00	2	0	AAAA	1	RANDOM		
4	DPCH	32	5	0.00	16	0	AAAA	1	RANDOM		
2/5	DPCH	32	6	0.00	4	0	AAAA	1	RANDOM		
2/6	DPCH	32	7	0.00	14	0	AAAA	1	RANDOM		
7	DPCH	32	8	0.00	6	0	AAAA	1	RANDOM		
8											

These conflicts are flagged in the channel setup table editor. When there is a domain conflict the row number of the conflicting channel is highlighted (flagged), with the row number of the channel it conflicts with. In this example, rows 5 and 6 have a conflict with row 2. Row 2 occupies the channel code domain of 0024-0031 (see the previous

illustration). Row 5 conflicts by occupying Channel Code Domain: 0024-0027. Then, row 6 conflicts by occupying Channel Code Domain: 0028-0031, as shown in the following figure.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Edit Item	
I				RF OFF		MOD ON		Insert Row	
								Delete Row	
Chip Rate: 4.096000Mcps		Link: Forward		Total Power: 8.45dB		Channel Code Domain: 0028-0031		Adjust Code Domain Power	
Domain Conflict	Type	Rate ksp/s	Spread Code	Power dB	Symbol Offset	TFCI	TPC	Scramble Code	Data
1	DPCH	16	2	0.00	0	0	AAAA	1	RANDOM
2	DPCH	64	3	0.00	18	0	AAAA	1	RANDOM
3	DPCH	32	4	0.00	2	0	AAAA	1	RANDOM
4	DPCH	32	5	0.00	16	0	AAAA	1	RANDOM
2/5	DPCH	32	6	0.00	4	0	AAAA	1	RANDOM
2/6	DPCH	32	7	0.00	14	0	AAAA	1	RANDOM
7	DPCH	32	8	0.00	6	0	AAAA	1	RANDOM
8	-----	-----	-----	-----	-----	-----	-----	-----	-----
								Goto Row	
								More (1 of 2)	

Resolving Conflicts

To resolve conflicts, you can change the value of the spread code. To make changes, use the table editor functions to highlight the value you want to change, then enter the new value using the front panel keys. In the following illustration, the spread code, in row two, has been changed to 9 to resolve the conflicts in rows 5 and 6.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Edit Item	
T				RF OFF		MOD ON		Insert Row	
								Delete Row	
Chip Rate: 4.096000Mcps		Link: Forward		Total Power: 8.45dB		Channel Code Domain: 0072-0079		Adjust Code Domain Power	
Type	Rate ksp/s	Spread Code	Power dB	Symbol Offset	TFCI	TPC	Scramble Code	Data	
1	DPCH	16	2	0.00	0	0	AAAA	1	RANDOM
2	DPCH	64	9	0.00	18	0	AAAA	1	RANDOM
3	DPCH	32	4	0.00	2	0	AAAA	1	RANDOM
4	DPCH	32	5	0.00	16	0	AAAA	1	RANDOM
5	DPCH	32	6	0.00	4	0	AAAA	1	RANDOM
6	DPCH	32	7	0.00	14	0	AAAA	1	RANDOM
7	DPCH	32	8	0.00	6	0	AAAA	1	RANDOM
8	-----	-----	-----	-----	-----	-----	-----	-----	-----
								Goto Row	
								More (1 of 2)	

Outputting a W-CDMA Waveform

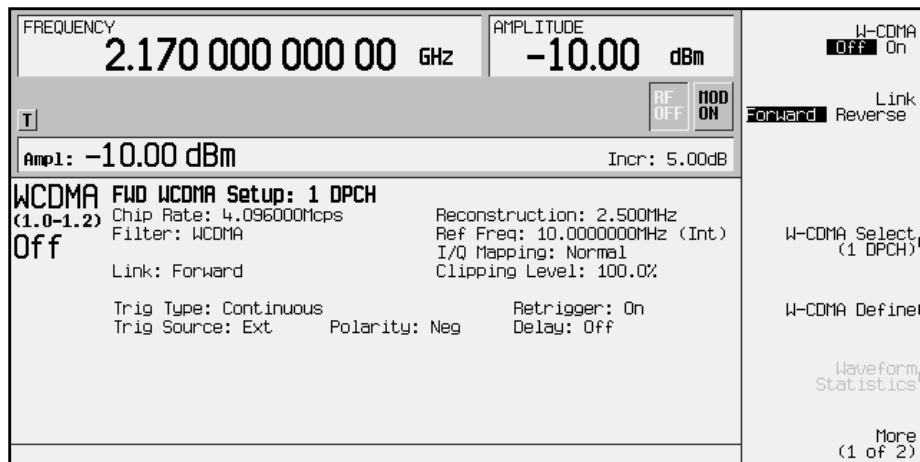
This section explains how to set the carrier frequency and power, generate a W-CDMA waveform, enable the modulation and the RF output, and adjust the waveform's clipping level.

Setting the Carrier Frequency and Power

Perform the following procedure to set the carrier signal's power and frequency.

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)** to display the W-CDMA menu.
5. For this example, set the RF output frequency to 2.17 GHz by pressing the front panel **Frequency** key. Enter 2.17 GHz by rotating the front panel knob, using the up and down arrow keys, or entering the value using the numeric keypad. (If using the numeric keypad to enter a new value, terminate the entry with the **GHz** softkey.)
6. Set the output power to -10 dBm by pressing the front panel **Amplitude** key. Enter -10 by rotating the front panel knob, using the up and down arrow keys, or entering the value using the numeric keypad. (If using the numeric keypad to enter a new value, terminate the entry with the **GHz** softkey.)

The carrier frequency and power have now been set. The following illustration shows the display with the current configuration.

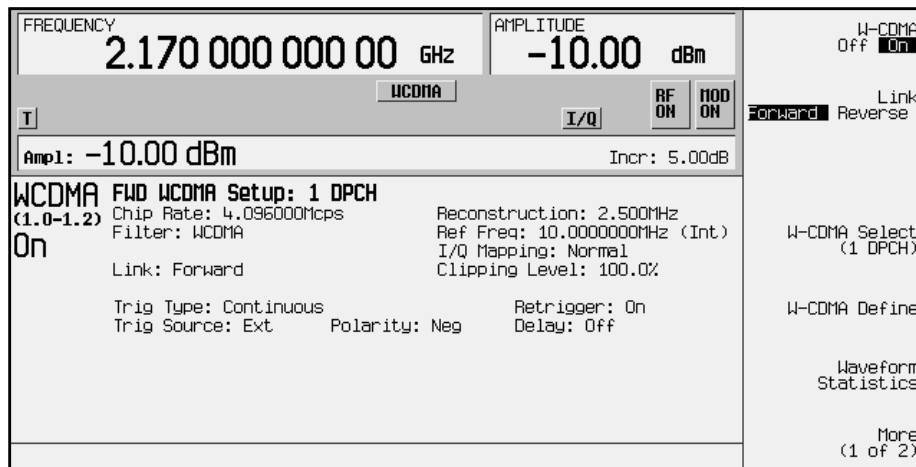


Generating the W-CDMA Waveform and Enabling the RF Output

Perform the following procedure to generate a W-CDMA waveform and activate the RF output.

1. Press **W-CDMA Off On** until **On** is highlighted to generate the W-CDMA waveform. (The signal generator displays a message while the waveform is being generated.) The **WCDMA** and **I/Q** annunciators turn on.
2. Toggle the front panel **RF On/Off** key until the display annunciator reads **RF ON**.
3. Modulation should be turned on as a default condition. (The display annunciator shows **MOD ON**.) If modulation is off, toggle the front panel **Mod On/Off** key.

The W-CDMA signal is now present at the front panel **RF OUTPUT** connector. The following illustration shows the display with the current configuration.



Setting the Clipping Level of the W-CDMA Signal

Perform the following procedure to set the clipping level of the CDMA2000 waveform.

Notice that in the status area of the screen shown above, the default clipping level is 100 percent. Clipping has not been applied to the signal when the clipping value is set to 100 percent.

1. Press **W-CDMA Define, More (1 of 2)**.
2. Press **Clipping Level** and enter 80 percent by rotating the front panel knob, using the arrow keys, or entering the value using the numeric keypad. (If using the numeric keypad to enter a new value, terminate the entry with the % softkey.) The signal generator rebuilds the waveform and the new clipping level is shown in the status area of the screen.

NOTE If you use the front panel knob or arrow keys to adjust the clipping level, the waveform is rebuilt after any pause during the adjustment.

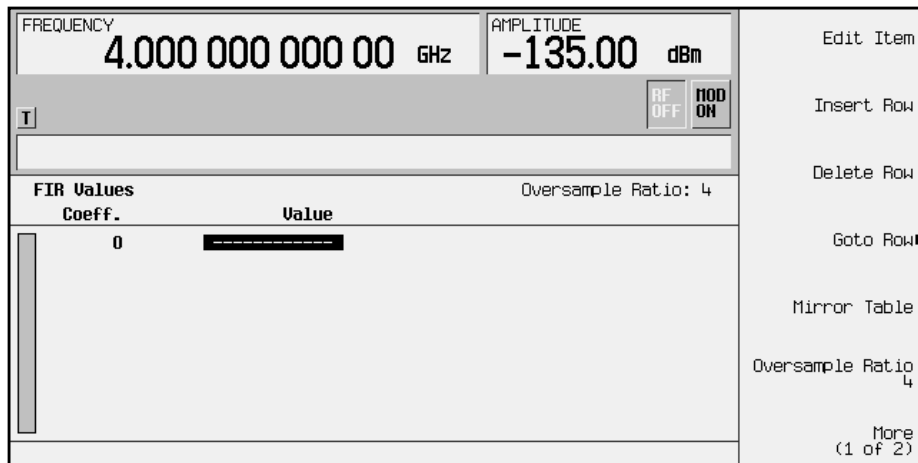
Creating a User-Defined FIR Filter Using the FIR Table Editor

Using this procedure you will create and store an 8-symbol, windowed sinc function filter with an oversample ratio of 4.

Accessing the Table Editor

Perform the following procedure to access the FIR filter table editor.

1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**. The FIR table editor is displayed. The following illustration shows the FIR table editor.



Entering the Coefficient Values

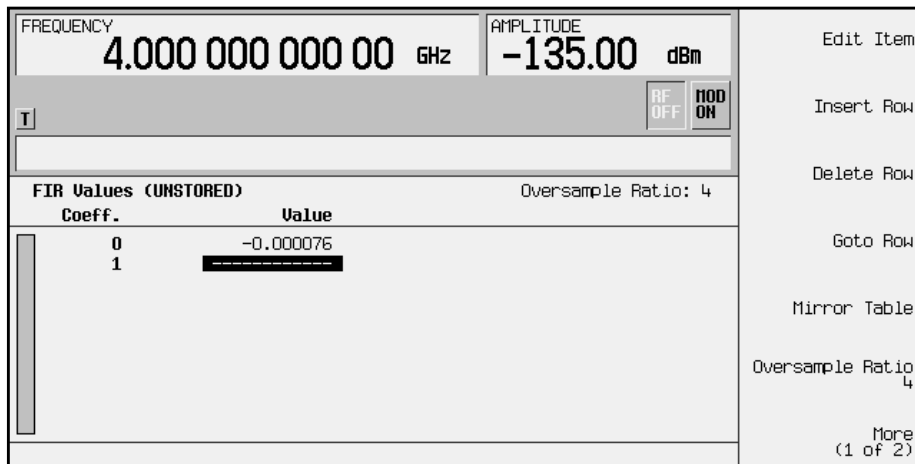
The FIR table editor creates a filter from values that you provide.

1. Use the cursor to highlight the `value` field for coefficient 0. Use the numeric keypad to type the first value (-0.000076) from the following table. As you press the numeric keys, the numbers are displayed in the active entry area. (If you make a mistake, you can correct it using the backspace key.)

Coefficient	Value
0	-0.000076
1	-0.001747
2	-0.005144
3	-0.004424
4	0.007745
5	0.029610
6	0.043940
7	0.025852

Coefficient	Value
8	-0.035667
9	-0.116753
10	-0.157348
11	-0.088484
12	0.123414
13	0.442748
14	0.767329
15	0.972149

Terminate your entry by pressing the **Enter** softkey. Notice that the value for coefficient 0 is now displayed in the `value` field, and the cursor has moved to the second row in the `value` column. The following illustration shows the FIR table editor at this point in the process.



2. Continue entering the coefficient values from the table in step 1 until all 16 values are complete.

Duplicating the First 16 Coefficients Using Mirror Table

In a windowed sinc function filter, the second half of the coefficients are identical to the first half in reverse order. The signal generator provides a mirror table function that automatically duplicates the existing coefficient values in the reverse order.

1. Press the **Mirror Table** softkey. The last 16 coefficients (16 through 31) are automatically generated and the first of these coefficients (number 16) is highlighted. The following illustration shows the display at this point in the process.

FREQUENCY		4.000 000 000 00 GHz		AMPLITUDE		-135.00 dBm		Edit Item
I				RF OFF		MOD ON		Insert Row
FIR Values (UNSTORED)				Oversample Ratio: 4				Delete Row
	Coeff.		Value					Goto Row
	10		-0.157348					Mirror Table
	11		-0.088484					Oversample Ratio 4
	12		0.123414					More (1 of 2)
	13		0.442748					
	14		0.767329					
	15		0.972149					
	16		0.972149					
	17		0.767329					
	18		0.442748					
	19		0.123414					

Setting the Oversample Ratio

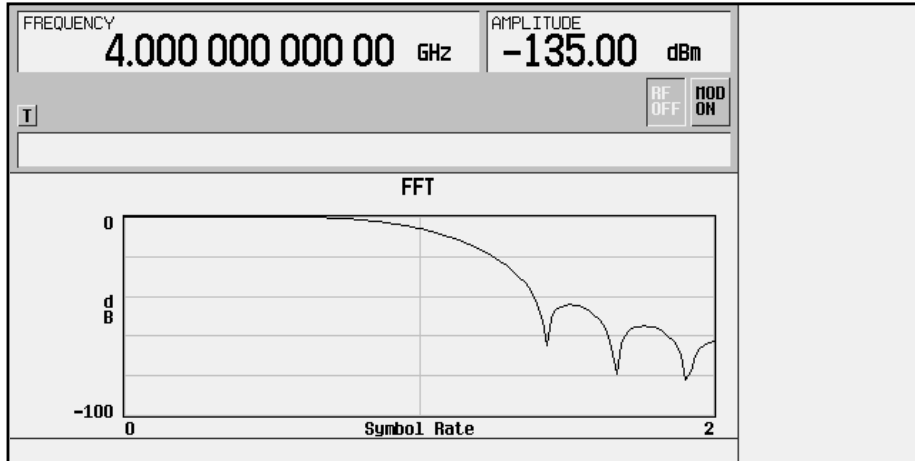
The oversample ratio (OSR) is the number of filter taps per symbol. Acceptable values range from 1 through 32; the maximum combination of symbols and oversampling ratio allowed by the table editor is 1024. The instrument hardware, however, is actually limited to 32 symbols, an oversample ratio between 4 and 16, and 256 coefficients. So if you enter more than 32 symbols or 256 coefficients, the instrument is unable to use the filter. If the oversample ratio is different from the internal, optimally selected one, then the filter is automatically resampled to an optimal oversample ratio.

For this example, the desired OSR is 4, which is the default, so no action is necessary.

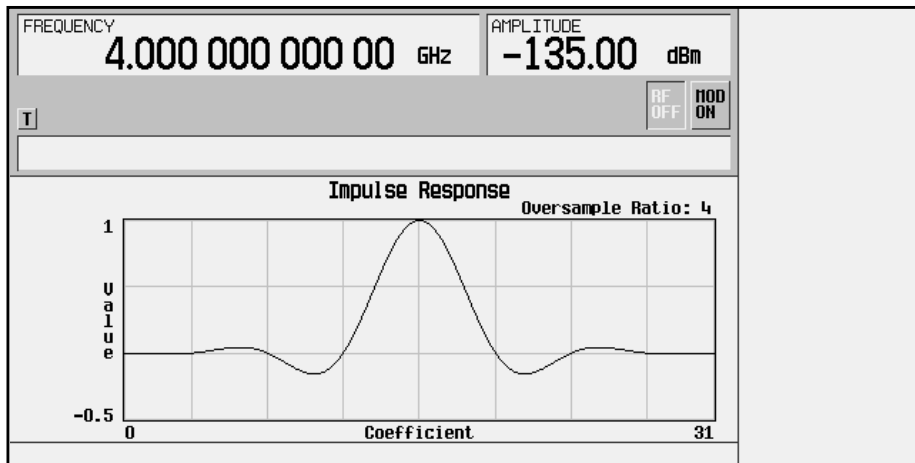
Displaying a Graphical Representation of the Filter

The signal generator has the capability of graphically displaying the filter in both time and frequency dimensions.

1. To view the filter frequency response (calculated using a fast Fourier transform), press **More (1 of 2), Display FFT**. The following graph is displayed.



2. To return to the menu keys, press **Return**.
3. Display the filter impulse response in time by pressing **Display Impulse Response**. The following graph is displayed.

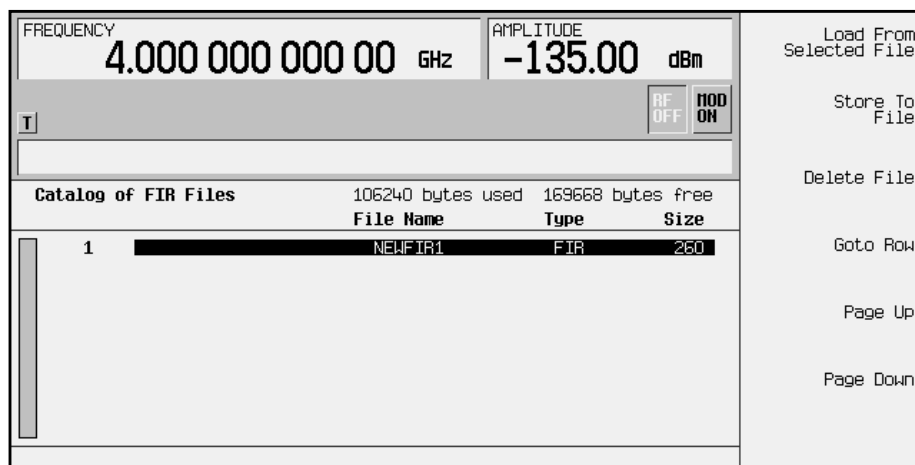


4. To return to the menu keys, press **Return**.

Storing the Filter to Memory

The filter is now complete and can be stored to non-volatile memory for future use. At any time you can check the information at the top of the FIR table editor to determine whether the current table has been stored. Your current table should display the following text: FIR Values (UNSTORED). If you attempt to exit the table editor mode without first storing to a file, the signal generator first prompts you to confirm that you want to exit without storing to a file. If you do *not* want to exit after all, press Return. To store the file, perform the following steps.

1. Press **Load/Store, Store To File**. The catalog of FIR files is displayed along with the amount of memory available.
2. For this example, you will title the file NEWFIR1. The file name is created by pressing the softkey containing the desired character, then selecting the softkey with that character from the subsequent menu. For example, press the **HIJKLMN** softkey. Then press the bottom softkey, **N**. **N** is displayed in the active entry area following the **Store to:** text.
3. Continue entering the characters for the file name until **NEWFIR1** is displayed in the active entry area. (Use the numeric keypad to enter the number 1.)
4. Press **Enter** when the file name is complete. The contents of the current FIR table editor are stored to a file in non-volatile memory. The following illustration shows the display.



The NEWFIR1 file is the first file name listed. (If you have previously stored other FIR files, additional file names are listed below NEWFIR1.) The file type is FIR and the size of the file is 260 bytes. The amount of memory used is also displayed. The number of files that can be saved depends on the size of the files and the amount of memory used. Memory is also shared by instrument state files and list sweep files.

This filter can now be used to customize a modulation or it can be used as a basis for a new filter design. (Refer to the additional filter examples in this chapter.)

Modifying an FIR Filter Using the FIR Table Editor

FIR filters stored in signal generator memory can easily be modified using the FIR table editor. You can load the FIR table editor with coefficient values from user-defined FIR files stored in the signal generator's memory, or from one of the default FIR filters. Then you can modify the values, and store the new files. In this example, you will load the FIR table editor with the values for a default Gaussian filter and then modify it.

Loading the Default Gaussian FIR File

Perform the following procedure to load the default Gaussian FIR filter into the FIR filter table editor.

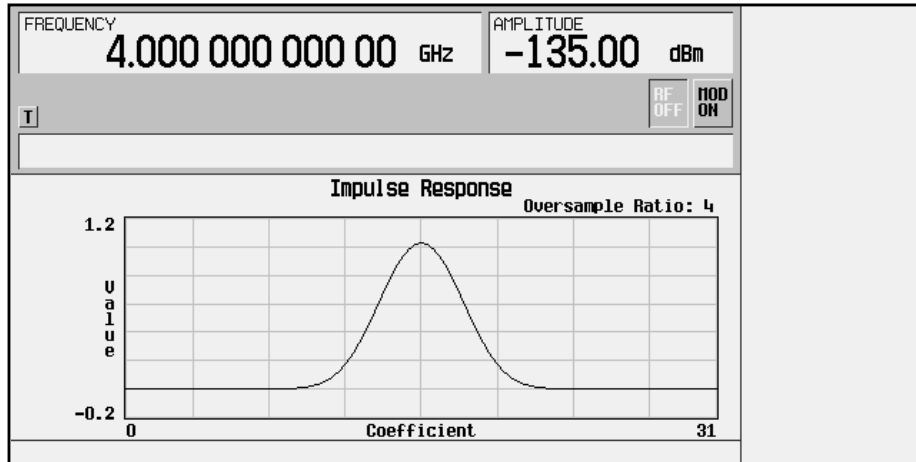
1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats, W-CDMA (Rev. 1.0-1.2), W-CDMA Define**.
4. Press **Filter, Define User FIR, More (1 of 2), Load Default FIR, Gaussian**.
5. Set the filter BbT to 0.300 (if **Filter BbT** is not already set to this value) by pressing **Filter BbT** and rotate the front panel knob until 0.300 is displayed.
6. Set the number of filter symbols to 8 (if **Filter Symbols** is not already set to this value) by pressing **Filter Symbols** and rotating the front panel knob until 8 is displayed.
7. Press **Generate**. The FIR table editor should now contain the coefficient values for the specified Gaussian filter.

NOTE

The actual oversample ratio during modulation is automatically selected by the instrument. A value between 4 and 16 is chosen dependent on the symbol rate, the number of bits per symbol of the modulation type, and the number of symbols.

8. Press **Display Impulse Response** for a graphic representation of the filter impulse response as shown in the following figure.

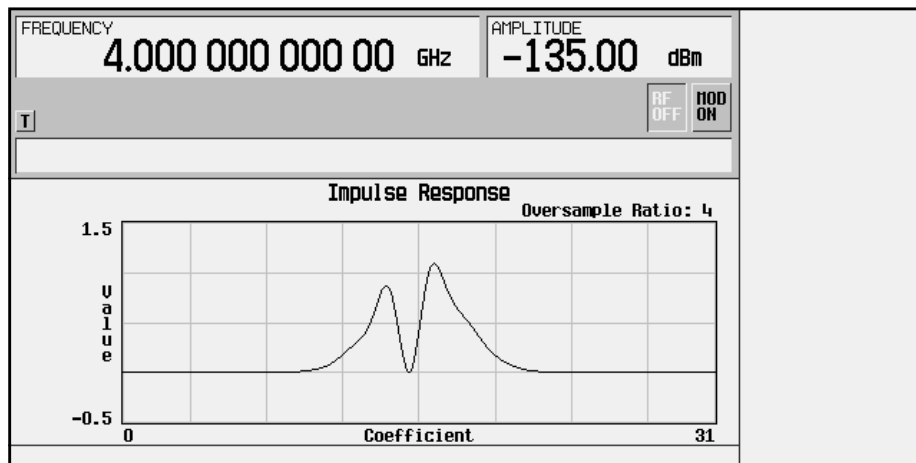
9. To return to the menu keys, press Return.



Modifying the Coefficients

Perform the following procedure to modify the filter coefficients in the FIR filter table editor.

1. Use the front panel knob to scroll until coefficient 15 is highlighted.
2. Press 0, Enter to change the value of the coefficient to 0.
3. Press Display Impulse Response to see the effects of the change.



Notice that the graphic display can provide a useful troubleshooting tool (in this case, indicating a missing coefficient value for a proper Gaussian response).

4. To return to the menu keys, press Return.
5. In addition to changing existing values, you can also insert and delete rows of coefficients and change the oversample ratio. (Press More (2 of 2) to access these softkeys.)
6. Change coefficient 15 back to its original value by using the front panel knob to highlight row 15, and pressing 1, Enter.

Storing the Filter to Memory

Perform the following procedure to store the modified Gaussian filter to the signal generator's memory catalog.

1. Press **Load/Store, Store To File**. The catalog of FIR files is displayed along with the amount of memory available.
2. Name the file NEWFIR2.
3. Press **Enter** when the file name is complete. The contents of the current FIR table editor are stored to a file in non-volatile memory, and the catalog of FIR files is updated to show the new file.

Applying a User-Defined FIR Filter to a W-CDMA Waveform

Custom FIR filters can be created using the FIR table editor feature or they can be created externally and downloaded into signal generator memory. Once the filter is stored in memory, it can be selected for use with your custom modulation state. This example requires that at least one FIR file be already stored in memory. For an example of creating and storing an FIR filter, see “Creating a User-Defined FIR Filter Using the FIR Table Editor” on page 2-26.

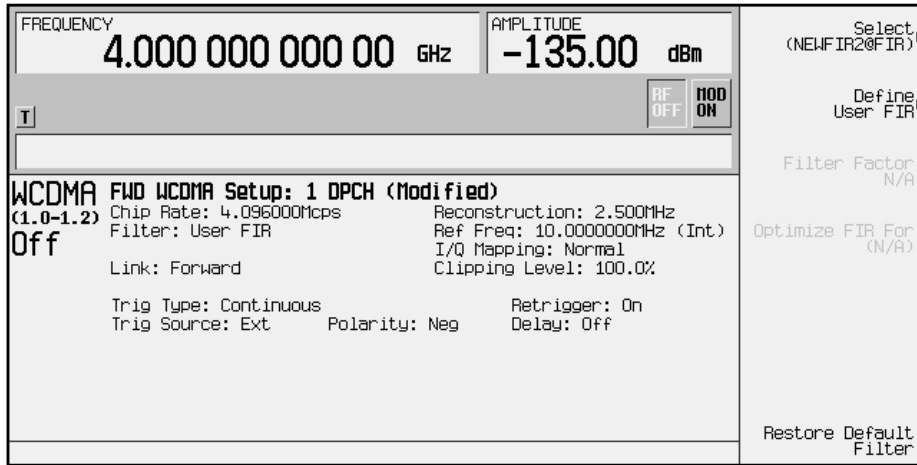
1. Press **Preset** to set the signal generator to normal preset conditions.
2. Press the front panel **Mode** key. If the **Arb Waveform Generator** softkey is visible, press it next.
3. Press **CDMA Formats**.
4. Press **W-CDMA (Rev. 1.0-1.2)**, **W-CDMA Define**, **Filter**, **Select**, **User FIR**. The catalog of FIR files should now be displayed. The following illustration shows an example of the catalog.

FREQUENCY		AMPLITUDE	
4.000 000 000 00 GHz		-135.00 dBm	
RF OFF		MOD ON	
Catalog of FIR Files			
110464 bytes used		165444 bytes free	
File Name	Type	Size	
1 NEWFIR1	FIR	260	
2 NEWFIR2	FIR	260	

In this example, there are two FIR files listed: NEWFIR1 and NEWFIR2. (These files were created in the previous examples.)

5. Scroll down in the list until the desired filter is highlighted. In this example, NEWFIR2 is the desired filter. You can use the front panel knob or the arrow keys as well as the **GoTo Row** function to highlight the filter.

6. Press **Select File**. The highlighted filter is now selected for use in your custom modulation state. The following illustration shows your example displayed.



The filter you selected is NEWFIR2. You can see the name, followed by @FIR, displayed below the **Select** softkey. In the Filter field, near the left of the display, User FIR is displayed to indicate that a user-defined FIR filter has been selected.

Once you have set the other modulation parameters to your satisfaction, turn on Custom and the RF output and your user-defined filter is in use.

NOTE

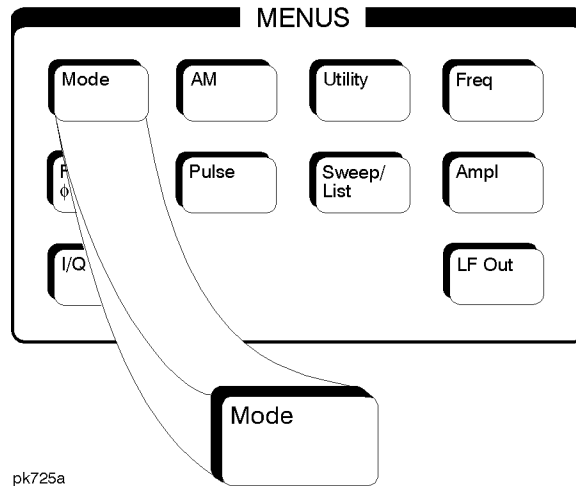
The actual oversample ratio during modulation is automatically selected by the instrument. A value between 4 and 16 is chosen dependent on the symbol rate, the number of bits per symbol of the modulation type, and the number of symbols.

3 Softkey Reference

This chapter describes the **Mode** hardkey and the associated softkeys that are used to activate functions specific to the dual arbitrary waveform generator Option 100.

The softkeys are presented in alphabetical order.

Mode Key



When you press the front-panel **Mode** key, the softkeys that appear depend on how many options are included in the instrument. When an instrument has options in addition to the **UND** option, the softkey **Arb Waveform Generator** provides access to all Dual Arbitrary Waveform Generator softkeys (including the optional personalities).

The softkeys described in this chapter are only available under the **W-CDMA (Rev 1.0-1.2)** softkey.

The SCPI commands that duplicate these softkeys remotely are also provided in this section (see also [Chapter 5, “Remote Programming”](#)).

(n) ksps

There are a number of softkeys available for setting the symbol rate for the inserted DPCH or Spread Only forward link channel, or for multiple channels in the W-CDMA Edit Channel Setup table editor. Where (n) ksps can equal any of the following: 8 ksps, 16 ksps, 32 ksps, 64 ksps, 128 ksps, 256 ksps, 512 ksps, or 1024 ksps. For the reverse link you can insert the symbol rate into *multiple* dedicated physical data channels (DPDCH).

Softkey Location (Forward Link): Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **DPCH** (or **Spread Only**, or **Multiple Channels**, **Symbol Rate**), **(n) ksps** (*See above description of (n) ksps.*)

SCPI Commands (Forward Link):

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <symbol_offset>,
<TFCI>, <TPC>, <scramble_code>, RANDom| <data_val>,
<TFCI_power>, <TPC_power>, <pilot_power>

[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

Softkey Location (Reverse Link): Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert DPDCH**, **Symbol Rate**, **(n) ksps** (*See above description of (n) ksps.*)

SCPI Commands (Reverse Link):

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <TFCI>, <TPC>,
RANDom| <data_val>

[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup:
TABLE:CHANnel? <chan_num>
```

1 DPCH

Press this softkey to select a single DPCH forward channel for the W-CDMA setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **1 DPCH**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:
SETup DPCH1

[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?
```

2.500 MHz

Press this softkey to select a reconstruction filter with a cutoff frequency of 2.500 MHz.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **CDMA Define**, **Reconstruction Filter**, **2.500 MHz**

SCPI Commands:

```
[ :SOURce ] :RADio :ARB :RFILter 2.500 MHz
```

```
[ :SOURce ] :RADio :ARB :RFILter ?
```

3 DPCH

Press this softkey to select three DPCH forward channels for the W-CDMA setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **3 DPCH**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :  
SETup DPCH3
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup ?
```

8.000 MHz

Press this softkey to select a reconstruction filter with a cutoff frequency of 8.000 MHz.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Reconstruction Filter**, **8.000 MHz**

SCPI Commands:

```
[ :SOURce ] :RADio :ARB :RFILter 8.0 MHz
```

```
[ :SOURce ] :RADio :ARB :RFILter ?
```

250 kHz

Press this softkey to select a reconstruction filter with a cutoff frequency of 250 kHz.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Reconstruction Filter**, **250.0 kHz**

SCPI Commands:

```
[ :SOURce ] :RADio :ARB :RFILter 250 kHz
```

```
[ :SOURce ] :RADio :ARB :RFILter ?
```

Adjust Code Domain Power

Press this softkey to access a menu that enables you to adjust the code domain power (the relative power in each of the channels). Select **Equal Energy per Symbol** (all channels are of equal energy per bit and the total power equals 0 dB), or **Scale to 0 dB** (scale all of the current channel powers so that the total power equals 0 dB while keeping the previous relative power ratios between the individual channels). Available in Forward Link only.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Adjust Code Domain Power**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:PADJust EQUal | SCALe
```

Apply Channel Setup

Press this softkey to apply the changes made in the channel setup table editor (see “[Edit Channel Setup](#)” on page 3-12) for the current link. If the waveform is set to **On**, the new channel data generates a new modulation waveform in ARB waveform memory.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Apply Channel Setup**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:APPLY
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:APPLY
```

ARB Reference Ext Int

Press this softkey to select either an internal or an external reference for the waveform clock. If you choose external, you must enter the reference frequency (as described under the [Reference Frequency](#) softkey on [page 3-33](#)) and apply the signal to the BASEBAND GEN REF IN connector.

Default value: Int

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **More (1 of 2)**, **ARB Reference Ext Int**

SCPI Commands:

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

```
[ :SOURce ]:RADio:ARB:CLOCK:REFerence[ :SOURce ]?
```

Bus

Press this softkey to set the trigger source to bus. When the trigger source is set to bus, the signal generator triggers an event when it receives the appropriate command via HP-IB.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Trigger Source**, **Bus**

SCPI Commands:

```
[ :SOURCE ] :RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURCE ] BUS  
[ :SOURCE ] :RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURCE ] ?
```

Channels

Press this softkey, then enter the number of duplicate channels that you want to set up and insert into the Edit Channel Setup table editor. Press the softkey **Enter** to terminate the entry.

After you have set the channel parameters, and the number of times you want the channel duplicated, press **Done** to insert the information into the table editor.

Default value: 1

Range: 1 through 511

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**, **Channels**

SCPI Commands:

```
[ :SOURCE ] :RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:  
TABLE:CHANnel INIT|APPend| <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <symbol_offset> ,  
<TFCI> , <TPC> , <scramble_code> , RANDom| <data_val> ,  
<TFCI_power> , <TPC_power> , <pilot_power>  
  
[ :SOURCE ] :RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:  
TABLE:CHANnel? <chan_num>
```

Chip Rate

Press this softkey to display a menu where you can choose the chip rate for the channels in the current table editor.

Default value: 4.096000 Mcps

Available Values (in Mcps): 4.096, 8.192, 16.384

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **More (1 of 2)**, **Chip Rate**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:CRATe <value>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:CRATe?
```

Clipping Level

Use this softkey, to clip (limit) the modulation level of the baseband waveform to a percentage of full scale. A level of 100.0% equates to no clipping.

Default value: 100.0%

Range: 10.0 through 100.0% in 0.1% increments

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **More (1 of 2)**, **Clipping Level**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:CLIPping <10-100%>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:CLIPping?
```

Continuous

Press this softkey to set the W-CDMA trigger type to continuous. In continuous trigger mode, the waveform repeats itself indefinitely.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Continuous**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE CONT
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE?
```

Custom W-CDMA State

Press this softkey to display the W-CDMA Setup Select File menu for the current link, where you can choose a previously stored custom W-CDMA setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **Custom W-CDMA State**

SCPI Commands:

```
[ :SOURce ] : RADio : WCDMa : STANdard : ARB : LINK : FORWard :  
SETup "<file name>"
```

```
[ :SOURce ] : RADio : WCDMa : STANdard : ARB : LINK : FORWard : SETup?
```

```
[ :SOURce ] : RADio : WCDMa : STANdard : ARB : LINK : REVerse :  
SETup "<file name>"
```

```
[ :SOURce ] : RADio : WCDMa : STANdard : ARB : LINK : REVerse : SETup?
```

Define User FIR

Press this softkey to access a table editor for creating and modifying FIR filters. The FIR table editor allows a maximum filter length of 1024 taps with a maximum oversampling ratio of 32. An FIR filter selected for use in W-CDMA, however, cannot have more than 256 taps so the number of symbols and the oversample ratio should be selected accordingly. Examples of using the FIR table editor are provided in the “Using Functions” chapter.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**

SCPI Commands:

```
MEMory : DATA : FIR "<file name>" , osr ,  
coefficient { , coefficient }
```

```
MEMory : DATA : FIR ? "<file name>"
```

Delete All Rows

Press this softkey to delete all rows in the current table editor.

CAUTION Deletions cannot be recovered.

Delete All Rows is located in some table editors.

Delete File

Press this softkey to delete the highlighted file from the displayed catalog. You will be prompted for confirmation.

Delete File is located in catalogs of files.

Delete Row

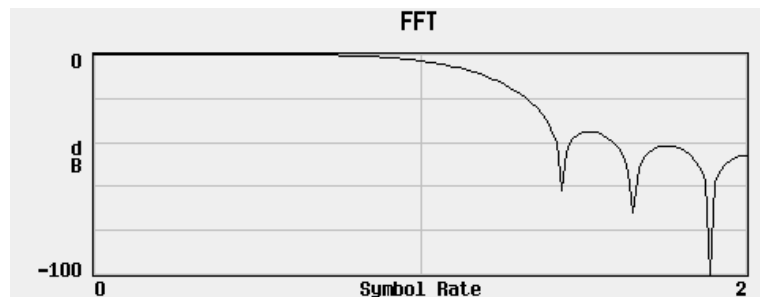
Press this softkey to delete the highlighted row in the table.

CAUTION Deletions cannot be recovered.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Delete Row**

Display FFT

Press this softkey to display a graphical representation of the frequency response of the 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.

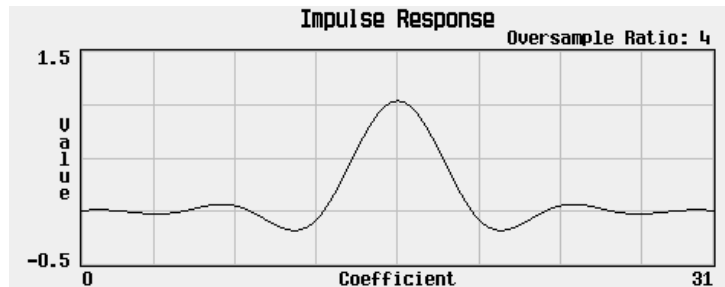


To return to the FIR table editor and the menu keys, press **Return**.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Display FFT**

Display Impulse Response

Press this softkey to display a graphical representation of impulse response in 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: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Display Impulse Response**

DPCCH

This softkey enables you to select a single DPCCH (Dedicated Physical Control Channel) channel for reverse link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **DPCCH**

SCPI Commands:

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:LINK:REVerse :  
SETup DPCCH
```

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?
```

DPCCH + 1 DPDCH

This softkey enables you to select a DPCCH channel plus one DPDCH channel for the reverse link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **DPCCH + 1 DPDCH**

SCPI Commands:

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:LINK:REVerse :  
SETup DDPDCH1
```

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?
```


DPCCH + 2 DPDCH

This softkey enables you to select a DPCCH channel plus two DPDCH channels for the reverse link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **DPDCH + 2 DPDCH**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:
SETup DDPDCH2
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?
```

DPCCH + 3 DPDCH

This softkey enables you to select a DPCCH channel plus three DPDCH channels for the reverse link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **DPDCH + 3 DPDCH**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:
SETup DDPDCH3
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?
```

DPCH

This softkey displays a menu that enables you to choose the symbol rate (in kbps) of the DPCH channel that is then inserted into the forward link Edit Channel Setup table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **DPCH**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend|<chan_num>,<chan_type>,
<symbol_rate>,<spread_code>,<power>,<symbol_offset>,
<TFCI>,<TPC>,<scramble_code>,RANDOM|<data_val>,
<TFCI_power>,<TPC_power>,<pilot_power>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

DPDCH Channels

This softkey allows you to set the number of DPDCH channels being inserted into the reverse link Edit Channel Setup table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert DPDCH**, **DPDCH Channels**

SCPI Commands:

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : LINK : REVerse : SETup :  
TABLE : CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <TFCI> , <TPC> , RANDom |  
<data_val>
```

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : LINK : REVerse : SETup :  
TABLE : CHANnel ? <chan_num>
```

Edit Channel Setup

Press this softkey to access a table editor where you can define the channel parameters of the current W-CDMA signal for the current link.

Use the front-panel knob or the arrow keys to move the cursor within the table structure, and the numeric keypad to change values contained in the table.

You can move quickly through a large table using the keys found beneath the **Goto Row** softkey.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**

SCPI Commands:

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : LINK : FORWard : SETup :  
TABLE : CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <symbol_offset> ,  
<TFCI> , <TPC> , <scramble_code> , RANDom | <data_val> ,  
<TFCI_power> , <TPC_power> , <pilot_power>
```

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : LINK : FORWard : SETup :  
TABLE : CHANnel ? <chan_num>
```

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : LINK : REVerse : SETup :  
TABLE : CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <TFCI> , <TPC> ,  
RANDom | <data_val>
```

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : LINK : REVerse : SETup :  
TABLE : CHANnel ? <chan_num>
```

Edit Item

Press this softkey to change the highlighted item in the displayed table.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**,
W-CDMA Define, **Edit Channel Setup**, **Edit Item**

Equal Energy per Symbol

Press this softkey to set the selected channel powers to equal energy per symbol (referenced to 8 kbps, and increasing by 3 dB for each doubling of the symbol rate). Available in Forward Link only.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**,
W-CDMA Define, **Edit Channel Setup**, **Adjust Code Domain Power**, **Equal Energy per Symbol**

SCPI Commands:

```
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup:  
TABLE:PADJust EQUal|SCALE
```

Ext

Press this softkey to set the trigger source to external triggering. When the trigger source is set to external, the signal generator will trigger an event when it receives the appropriate signal via the PATTERN TRIGGER IN connector.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**,
More (1 of 2), **Trigger**, **Trigger Setup**, **Trigger Source**, **Ext**

SCPI Commands:

```
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:TRIGger[ :SOURCE ] EXT  
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:TRIGger[ :SOURCE ]?
```

Ext Delay

Press this softkey to arm (On) or disarm (Off) the external trigger delay. To use external trigger delay, press this softkey until **Ext Delay On** is highlighted, and then set the external delay time by pressing the **Ext Delay Time** softkey.

Default value: Off

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Trigger Source**, **Ext Delay Off On**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ]:  
EXTernal:DELAy:STATE ON|OFF|1|0
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ]:  
EXTernal:DELAy:STATE?
```

Ext Delay Time

Press this softkey to set the time for the external trigger delay. External trigger delay may be adjusted to trigger a waveform at a specified length of time after an external trigger signal has been received at the PATTERN TRIG IN connector. Enter a new value and press the **Enter** terminator softkey.

To use external trigger delay, press **Ext Delay Off On** until **On** is highlighted, and then set the external delay time by pressing the **Ext Delay Time** softkey.

Default value: 2.000 milliseconds

Range of values: 2.0 microseconds through 3600 seconds.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Trigger Source**, **Ext Delay Time**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ]:  
EXTernal:DELAy <value>
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ]:  
EXTernal:DELAy?
```

Ext Polarity Neg Pos

Press this softkey to set the external trigger source polarity to either a positive change or a negative change in signal level. Depending on your choice, the signal generator will trigger an event when it receives the appropriate positive or negative change in signal at the PATTERN TRIG IN connector.

Default value: Neg

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Trigger Source**, **Ext Polarity Neg Pos**

SCPI Commands:

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

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]:  
EXTernal:SLOPe?
```

Filter

Press this softkey to access menus for selecting a filter type, restoring the default filter, and for defining a unique FIR filter. The Filter menu also lets you adjust the filter alpha (when Nyquist or root Nyquist filters are selected) or bandwidth time product (for Gaussian filters).

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer  
RNYQuist|NYQuist|GAUSSian|RECTangle|WCDMA|"User FIR"
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?
```

Filter Alpha

Press this softkey to change the FIR filter's alpha parameter in either the Filter menu or the Load Default FIR menus.

In the Filter Menu

The **Filter Alpha** softkey changes the alpha parameter of the selected root Nyquist or Nyquist filter. To enter a new value, rotate the front-panel knob until the desired value is displayed, use the up and down arrow keys, or enter the value using the numeric keypad and press the **Enter** terminator softkey.

This key only appears *after* choosing a root Nyquist or Nyquist filter. If a Gaussian filter is in use, you will see **Filter BbT**. If any other filter is in use, you will see a grayed-out softkey: **Filter Factor N/A**.

Default value: 0.500

Range of values: 0.000 through 1.000

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Filter Alpha**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer:ALPHa <value>
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer:ALPHa?
```

In the Load Default FIR Menu

The **Filter Alpha** softkey changes the alpha parameter of the root Nyquist or Nyquist filter coefficients loaded into the FIR table editor. After entering the alpha value, press **Generate** to modify the filter coefficients in the table editor.

Default value: 0.350

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Root Nyquist (or Nyquist)**, **Filter Alpha**

Filter BbT

Press this softkey to change the bandwidth-multiplied-by-bit-time (BbT) filter parameter in either the Filter menu or the Load Default FIR menu.

In the Filter Menu

The **Filter BbT** softkey changes the BbT parameter of the selected Gaussian filter. To enter a new value, rotate the front-panel knob until the desired value is displayed, use the up and down arrow keys, or enter the value using the numeric keypad and press the **Enter** terminator softkey.

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

Default value: 0.500

Range of values: 0.000 through 1.000

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **Gaussian**, **Filter BbT**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:BBT <value>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:BBT?
```

In the Load Default FIR Menu

The **Filter BbT** softkey changes the BbT parameter of the Gaussian filter coefficients loaded into the FIR table editor. After entering the BbT value, press **Generate** to modify the filter coefficients in the table editor.

Default value: 0.300

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Gaussian**, **Filter BbT**

Filter Factor

This grayed-out softkey is displayed when a filter is in use that doesn't contain an adjustable alpha or BbT parameter (such as the IS-95 filter selections or a user-defined FIR filter). This softkey changes to either **Filter Alpha** or **Filter BbT** if the appropriate root Nyquist, Nyquist, or Gaussian filter is selected for use.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Filter Factor**

Filter Symbols

Press this softkey to define the number of symbols for the filter to be loaded into the FIR table editor. The FIR table editor allows a maximum filter length of 1024 coefficients with a maximum oversample ratio of 32 and a maximum of 32 symbols. An FIR filter selected for use in CDMA, however, cannot have more than 256 coefficients so the number of symbols and the oversample ratio should be selected accordingly.

To change the number of symbols, rotate the front-panel knob until the desired value is displayed, use the up and down arrow keys, or enter the value using the numeric keypad and press the **Enter** terminator softkey.

Default value: 8

Range of values: 1 through 32

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Root Nyquist (or Nyquist, Gaussian, or Rectangle)**, **Filter Symbols**

First Spread Code

This softkey appears in the Multiple Channels menu, where you define a channel and then insert multiple entries of that channel into the Edit Channel Setup table editor.

Press the **First Spread Code** softkey, then enter the value that you want for the starting spread code for the channels that will be inserted. Press the softkey **Enter** to terminate the entry.

NOTE

Check existing entries in the table editor to be sure that there will be no duplication of an existing spread code. If there is, the warning **Domain Conflict** is displayed in the table. If this happens, select any duplicate **Spread Code** entries and give them unique values.

After you have set the channel parameters, and the number of times you want the channel duplicated, press **Done** to insert the information into the table editor.

Default value: 8

Range: 0 through 15

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**, **First Spread Code**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <symbol_offset>,
<TFCI>, <TPC>, <scramble_code>, RANDom| <data_val>,
<TFCI_power>, <TPC_power>, <pilot_power>
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

Gate Active

This softkey remains grayed-out until the trigger is set to Gated. Once the trigger has been set to Gated, press **Gate Active Low High** to toggle the polarity of the “through” or active state of a gated trigger signal. Gate Active Low will output the signal while the gate is low at the PATTERN TRIG IN connector. Gate Active High has the opposite effect, outputting the signal while the signal level at the PATTERN TRIG IN connector is in a high state.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Gate Active**

SCPI Commands:

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

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :TRIGger :TYPE :GATE :  
ACTive ?
```

Gated

Press this softkey to set the trigger type to Gated. Using a gated trigger, you can set the signal to output when a TTL high or low is present at the PATTERN TRIG IN connector. To set the gate to trigger on either high or low, press **Gated** and then press **Trigger Setup**, **Gate Active Low High**.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Gated**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :TRIGger :TYPE GATE
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :TRIGger :TYPE ?
```

Gaussian

Press this softkey to select the Gaussian pre-modulation filter in either the Select (filter) menu or the Load Default FIR menu.

In the Select (Filter) Menu

Pressing the **Gaussian** softkey selects this FIR filter for use in your filter setup. Use the **Filter BbT** softkey to change the filter bandwidth-multiplied-by-bit time product value.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **Gaussian**

Default Filter BbT Value: 0.500.

Filter BbT Range: 0.000 through 1.000

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer GAUSSian
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer?
```

In the Load Default FIR Menu

Pressing the **Gaussian** softkey followed by **Generate** 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 to reload the FIR table.

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: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Gaussian**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer GAUSSian
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer?
```

Goto Bottom Row

Press this softkey to move the selection bar to the bottom row in the current table editor or list of items.

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

Goto Middle Row

Press this softkey to move the selection bar to the middle row in the current table editor or list of items.

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

Goto Row

Press this softkey to display softkeys that enable you to select a row or page in a table or list of items.

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

Goto Top Row

Press this softkey to move the selection bar to the top row in the current table or list of items.

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

I/Q Mapping Normal Invert

Press this softkey, to select whether the I/Q outputs will be normal or inverted.

Default value: Normal

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **More (1 of 2)**, **I/Q Mapping Normal Invert**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :  
IQMap NORMAl | INVert | INVerted
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :IQMap?
```

Insert DPDCH

This softkey enables you to insert one or more DPDCH channels into the reverse link Edit Channel Setup table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert DPDCH**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <TFCI>, <TPC>, RANDom|
<data_val>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:CHANnel? <chan_num>
```

Insert Row

Press this softkey to display a menu that enables you to select the type of row you wish to insert into the current table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**

IS-95

This key appears in two places, the Select Filter menu and the IS-95 menu.

In the Select (Filter) Menu

Press the first **IS-95** softkey to open a menu for selecting an IS-95 baseband filter. The choices include the standard IS-95 filter, as well as a modified version of this filter for improved adjacent channel performance. (This modified filter still meets the IS-95 error function.) These two filters are also provided with an equalizer which provides base station phase equalization for the transmit signal path.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **IS-95**

In the IS-95 Menu

Press the second **IS-95** softkey to select the standard IS-95A baseband filter.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **IS-95**, **IS-95**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer IS95  
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer?
```

IS-95 Mod

Press this softkey to select a modified version of the standard IS-95 baseband filter. This filter is modified for improved adjacent channel performance. The modification, however, is done in a manner that still meets the IS-95 error function criterion.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **IS-95**, **IS-95 Mod**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer IS95_MOD  
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer?
```

IS-95 Mod w/EQ

Press this softkey to select a modified version of the standard IS-95 baseband filter. This filter is modified for improved adjacent channel performance, and includes the equalizer specified by IS-95. The filter modification is done in a manner that still meets the IS-95 error function criterion.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **IS-95**, **IS-95 Mod w/EQ**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer IS95_MOD_EQ  
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer?
```

IS-95 w/EQ

Press this softkey to select the standard IS-95 baseband filter with an equalizer provided for phase compensation required by the base station.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **IS-95**, **IS-95 w/EQ**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer IS95_EQ  
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:FILTer?
```

Link Forward Reverse

Use this softkey to select a W-CDMA forward or reverse link channel configuration.

Forward = base to mobile

Reverse = mobile to base

Default value: Forward

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **Link Forward Reverse**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK FORWARD|REVERSE
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK?
```

Load Default FIR

Press this softkey to access a menu for automatically filling the FIR table editor with coefficient values from pre-defined filters such as root Nyquist, Nyquist, Gaussian and Rectangle. The default filter parameters can also be selected in this menu allowing you to choose the filter alpha or BbT and the number of filter symbols.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**

Load From Selected File

Press this softkey to replace the current information in a table editor with the information stored in the highlighted file.

Load From Selected File is located in catalogs of files.

Load/Store

Press this softkey to access a menu for loading a table editor with values from files previously stored in the signal generator memory, and for saving to memory a user-defined a user-defined signal from the table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load/Store**

Mirror Table

Press this softkey to mirror the 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: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **Mirror Table**

Modify All Scramble Codes

Press this softkey to set the scramble code field to the same value for all channels in the current table editor. After you enter the desired value, press the softkey **Enter** to terminate the entry. Available in **Forward Link** only.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **More (1 of 2)**, **Modify All Scramble Codes**

Range: 0 to 512

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLE :CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <symbol_offset> ,  
<TFCI> , <TPC> , <scramble_code> , RANDom | <data_val> ,  
<TFCI_power> , <TPC_power> , <pilot_power>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLE :CHANnel ? <chan_num>
```

Multiple Channels

This softkey displays a menu that enables you to set up one or more identical channels to insert into the Edit Channel Setup table editor. After you have set the channel parameters, and how many times you want the channel duplicated, press **Done** to insert the information into the table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLE :CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <symbol_offset> ,  
<TFCI> , <TPC> , <scramble_code> , RANDom | <data_val> ,  
<TFCI_power> , <TPC_power> , <pilot_power>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLE :CHANnel ? <chan_num>
```


Nyquist

Press this softkey to select the Nyquist (raised cosine) pre-modulation filter in either the Select (filter) menu or the Load Default FIR menu.

In the Select (Filter) Menu

Pressing the Nyquist softkey selects this FIR filter for use in the filter setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **Nyquist**

Default Filter Alpha: 0.220

Range: 0 through 1

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer NYQuist
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?
```

In the Load Default FIR Menu

Pressing the Nyquist softkey followed by **Generate** loads the FIR table editor with the coefficient values for the 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 to reload the FIR table.

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: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Nyquist**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer NYQuist
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?
```

Optimize FIR For EVM ACP

Press this softkey to optimize the filter for minimized error vector magnitude (select EVM) or for minimized adjacent channel power (select ACP). The EVM selection provides the most ideal passband. The ACP selection improves stopband rejection. This feature only applies to root Nyquist, Nyquist, and Gaussian filters. The softkey is grayed out when any other filter is selected.

Default value: EVM

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Optimize FIR For EVM ACP**

SCPI Commands:

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:FILTer:CHANnel EVM|ACP  
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:FILTer:CHANnel?
```

Oversample Ratio

In the Define User FIR menu, use the **Oversample Ratio** softkey to set the oversampling ratio to be applied to a custom FIR filter design. Acceptable values range from 1 through 32, where the maximum combination of symbols and oversampling ratio is 1024. An FIR filter selected for use in CDMA, however, cannot have more than 256 coefficients so the number of symbols and the oversample ratio should be selected accordingly.

Default value: 4

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **Oversample Ratio**

SCPI Commands:

```
:MEMory:DATA:FIR "<file name>",osr,  
coefficient{,coefficient}  
:MEMory:DATA:FIR? "<file name>"
```

Page Down

Press this softkey to view the next page of listings in a table editor or catalog of files.

Page Down is located in table editor menus and in catalogs of files.

Page Up

Press this softkey to view the previous page of listings in a table editor or catalog of files.

Page Up is located in table editor menus and in catalogs of files.

Perch

This softkey appears in two places, the W-CDMA Select menu and the Insert Row menu.

The W-CDMA Select Menu

Press this softkey to select a single perch forward channel for the W-CDMA setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **Perch**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:
SETup PERCH

[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup?
```

The Insert Row Menu

Press this softkey to insert a perch channel into the current table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Perch**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup:
TABLE:CHANnel INIT|APPend|<chan_num>,<chan_type>,
<symbol_rate>,<spread_code>,<power>,<symbol_offset>,
<TFCI>,<TPC>,<scramble_code>,RANDom|<data_val>,
<TFCI_power>,<TPC_power>,<pilot_power>

[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup:
TABLE:CHANnel? <chan_num>
```

Perch + 1 DPCH

Press this softkey to select a perch channel plus one DPCH channel for the forward link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **Perch + 1 DPCH**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:
SETup PDPCH1

[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup?
```

Perch + 3 DPCH

Press this softkey to select a perch channel plus three DPCH forward channels for the forward link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **Perch + 3 DPCH**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:  
SETup PDPCH3
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?
```

Perch + 50 DPCH

Press this softkey to select a perch channel plus fifty DPCH forward channels for the forward link channel setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**, **Perch + 50 DPCH**

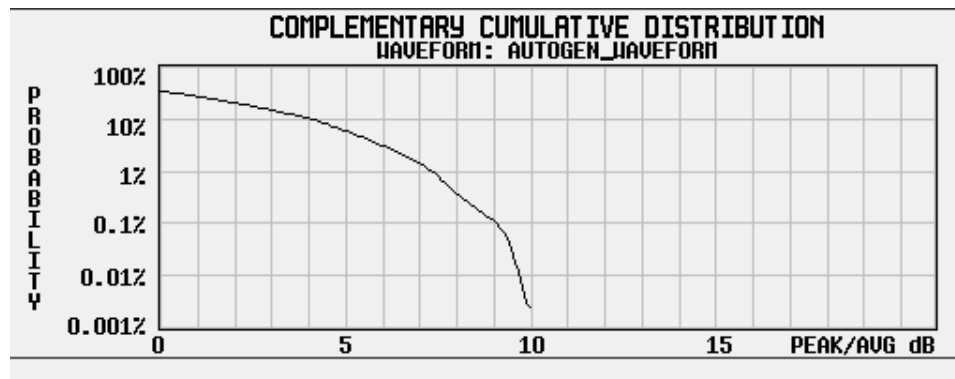
SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:  
SETup PDPCH50
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?
```

Plot CCDF

Press this softkey to display a plot of the Complementary Cumulative Distribution Function for the selected waveform. The plot displays the probability that the instantaneous envelope power is x dB above the average power, where x is the number on the horizontal axis.



Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **Waveform Statistics**, **Plot CCDF**

Power

This softkey appears in the Multiple Channels menu for the current link, where you define a channel and then insert multiple entries of that channel into the Edit Channel Setup table editor.

Press the **Power** softkey, then enter the value that you want for the power level of the channels that will be inserted. Press the softkey **Enter** to terminate the entry.

After you have set the channel parameters, and how many times you want the channel duplicated, press **Done** to insert the information into the table editor.

Default value: 0.00 dB

Range: -40.00 through 0.00

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0-1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**, **Power**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <symbol_offset>,
<TFCI>, <TPC>, <scramble_code>, RANDom| <data_val>,
<TFCI_power>, <TPC_power>, <pilot_power>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <TFCI>, <TPC>,
RANDom| <data_val>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:CHANnel? <chan_num>
```

Reconstruction Filter

Press this softkey to display a menu for selecting a reconstruction filter. You can choose a filter with a cutoff frequency of 250.0 kHz, 2.500 MHz, 8.000 MHz, or no filter (Through).

Default value: 2.500 MHz

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Reconstruction Filter**

SCPI Commands:

```
[ :SOURce ] :RADio :ARB :RFILter 250 kHz | 2.5 MHz |  
8.0 MHz | THROUGH  
  
[ :SOURce ] :RADio :ARB :RFILter ?
```

Rectangle

Press this softkey to select a rectangle pre-modulation filter in either the Select (filter) menu or the Load Default FIR menu.

In the Select (Filter) Menu

Pressing the **Rectangle** softkey selects this FIR filter for use in your filter setup.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **More (1 of 2)**, **Rectangle**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer RECTangle  
  
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer ?
```

In the Load Default FIR Menu

Pressing the **Rectangle** softkey followed by **Generate** 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: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Rectangle**

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer RECTangle  
  
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer ?
```

Reference Frequency

Press this softkey to set the reference frequency of the external clock. It is only accessible when you are using an external ARB reference applied to the BASEBAND GEN REF IN connector.

Default value: 10.0000000 MHz

Acceptable values: from 250.0000 kHz to 20.0000000 MHz.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **More (1 of 2)**, **Reference Freq**

SCPI Commands:

```
[ :SOURce]:RADio:ARB:CLOCK:REFerence:EXTernal:
FREQuency <value>
```

```
[ :SOURce]:RADio:ARB:CLOCK:REFerence:EXTernal:FREQuency?
```

Restore Default Filter

Press this softkey to replace the current FIR filter with the default filter (IS-95 Mod w/EQ).

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Restore Default Filter**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:ARB:FILTer WCDMA
```

```
[ :SOURce]:RADio:WCDMa:ARB:FILTer?
```

Retrigger Mode Off On

Press this softkey to toggle the operating state of the retrigger mode. With **Retrigger Mode Off On** set to **On**, if a trigger occurs while a waveform is playing, the waveform will retrigger at the end and play one more time. The retriggers do not accumulate. If several triggers are received during a waveform, it will only be replayed once. When **Retrigger Mode Off On** is set to **Off**, if a trigger occurs while a waveform is playing, it is ignored.

Default value: Off

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Retrigger Mode Off On**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:RETRigger ON|OFF|1|0
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:RETRigger?
```

Root Nyquist

Press this softkey to select the root Nyquist (root-raised cosine) pre-modulation filter in either the Select (filter) menu or the Load Default FIR menu.

In the Select (Filter) Menu

Pressing the **Root Nyquist** softkey selects this FIR filter and returns the Filter menu.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **Root Nyquist**

SCPI Commands:

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:FILTer RNYQuist  
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:FILTer?
```

In the Load Default FIR Menu

Pressing the **Root Nyquist** softkey followed by **Generate** loads the FIR table editor with the coefficient values for the 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 to reload the FIR table.

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: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Define User FIR**, **More (1 of 2)**, **Load Default FIR**, **Root Nyquist**

SCPI Commands:

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:FILTer RNYQuist  
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:FILTer?
```


Scale To 0dB

Press this softkey to scale all of the current channel powers so that the total power equals 0 dB while keeping the previous power ratios between the individual channels. Available in Forward Link only.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Adjust Code Domain Power**, **Scale to 0dB**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:PADJust SCALE
```

Scramble Code

This softkey appears in the Multiple Channels menu for the current link, where you define a channel and then insert multiple entries of that channel into the Edit Channel Setup table editor.

Press the **Scramble Code** softkey, then enter the value that you want for the scramble code for the channels that will be inserted. Press the softkey **Enter** to terminate the entry.

After you have set the channel parameters, and how many times you want the channel duplicated, press **Done** to insert the information into the table editor.

Default value: 0000000001

Range:

0 through 512, Forward Link

0 through 1FFFFFFFFF, Reverse Link

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**, **Scramble Code**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <symbol_offset>,
<TFCI>, <TPC>, <scramble_code>, RANDom| <data_val>,
<TFCI_power>, <TPC_power>, <pilot_power>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:
SCRamble <value>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SCRamble?
```

Second DPDCH I Q

This softkey allows you to set the second DPDCH channel to I or Q.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Second DPDCH I Q**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SDPDch I | Q  
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SDPDch ?
```

Select

Press this softkey to access a menu for selecting the pre-modulation filter type. You can choose from:

- Pre-defined filters, such as root Nyquist, Nyquist, Gaussian, several IS-95 baseband filters, and Rectangle. When you access this menu through the W-CDMA menus, a filter optimized for W-CDMA is also available.

The standard IS-95 filter is available as well as a modified version of this filter that meets the IS-95 error function for improved adjacent channel performance. These two filters are also provided with an equalizer for phase compensation required by the base station.

- A catalog of files stored in the signal generator memory. You can select any filter that you have either created externally and downloaded into memory, or that you have created internally in the Define User FIR menu and subsequently stored.

Default value: WCDMA

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer RNYQuist |  
NYQuist | GAUSSsian | RECTangle | WCDMA | "User FIR"  
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer ?
```

Select File

Press this softkey to select a stored file.

Select File is located in catalogs of files.

SCPI Commands (for selecting a user-defined FIR filter):

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILter "<file name>"
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILter?
```

SCPI Commands (for selecting a custom W-CDMA state):

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup "<file name>"
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWARD:SETup?
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup "<file name>"
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup?
```

Single

Press this softkey to set the trigger type to single. After receiving a trigger, the waveform is output once.

Softkey Location: Press Mode, CDMA Formats, W-CDMA (Rev 1.0–1.2), More (1 of 2), Trigger, Single

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE SINGLE
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE?
```

Spread Only

This softkey sets all symbols for the channel being inserted to random values, instead of having specific bit fields such as pilot, TPC, etc. This softkey also displays a menu that enables you to choose the symbol rate (in ksp/s) of the Spread Only forward channel that is then inserted into the Edit Channel Setup table editor.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Spread Only**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend| <chan_num>, <chan_type>,
<symbol_rate>, <spread_code>, <power>, <symbol_offset>,
<TFCI>, <TPC>, <scramble_code>, RANDom| <data_val>,
<TFCI_power>, <TPC_power>, <pilot_power>
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

Store Custom W-CDMA State

Press this softkey to access a menu that enables you to store the current custom W-CDMA state into the file you enter. Afterward, you can recall this custom state from the signal generator's memory (as described under the softkey [Custom W-CDMA State](#)).

Along with the contents of the W-CDMA channel table editor, this softkey stores the following signal generator state information to the memory catalog:

- FIR filter
- FIR filter file name
- FIR filter alpha
- FIR filter BbT
- FIR filter channel (EVM or ACP)
- I/Q Mapping
- Link
- chip rate
- ARB reconstruction filter
- ARB reference clock source (internal or external)
- ARB reference clock frequency
- Clipping Level
- Forward TFCI state
- Reverse TFCI state
- Reverse DPDCH (second DPDCH I or Q)
- Reverse Scramble Code

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Store Custom W-CDMA State**

SCPI Commands:

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:  
STORE "<file name>"
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup:  
STORE "<file name>"
```

Store To File

Press this softkey to display a menu where you can store the current table editor information for later use.

Store To File is located in catalogs of files.

SCPI Command:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
STORE "<file name>"
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETup :  
STORE "<file name>"
```

Symbol Rate

This softkey appears in the Multiple Channels menu for the current link, where you define a channel and then insert multiple entries of that channel into the Edit Channel Setup table editor.

Press the **Symbol Rate** softkey, then enter the symbol rate that you want for the channel definition. Press the softkey **Enter** to terminate the entry.

After you have set the channel parameters, and the number of times you want the channel duplicated, press **Done** to insert the information into the table editor.

Default value: 32 ksps

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**, **Symbol Rate**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLE :CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <symbol_offset> ,  
<TFCI> , <TPC> , <scramble_code> , RANDom | <data_val> ,  
<TFCI_power> , <TPC_power> , <pilot_power>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLE :CHANnel? <chan_num>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETup :  
TABLE :CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <TFCI> , <TPC> , RANDom |  
<data_val>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETup :  
TABLE :CHANnel? <chan_num>
```

TFCI Field Off On

Press this softkey to turn the TFCI (Transport Format Combination Indicator) field on or off for all the channels in the current table editor.

Default value: On

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **More (1 of 2)**, **TFCI Field Off On**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:  
TFCI ON|OFF|1|0
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:TFCI?
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:  
TFCI ON|OFF|1|0
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:TFCI?
```

Through

Press this softkey to bypass all reconstruction filtering. This is useful for using external reconstruction filters at frequencies different than those supplied internally.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Reconstruction Filter**, **Through**

SCPI Commands:

```
[ :SOURce]:RADio:ARB:RFILter THRough  
[ :SOURce]:RADio:ARB:RFILter?
```

Trigger

Press this softkey to display the trigger menu, where you can select types of triggering. The menu also contains a **Trigger Setup** key that enables you to adjust the trigger source, the retrigger mode, and the gate active polarity.

Default value: Continuous

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:  
TYPE CONTinuous|SINGle|GATE
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE?
```

Trigger Key

Press this softkey to set the trigger source to the signal generator's front-panel **Trigger** hardkey. When the trigger source is set to **Trigger Key**, the signal generator will trigger an event when the **Trigger** hardkey is pressed.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**, **Trigger Source**, **Trigger Key**

SCPI Commands:

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ] KEY
```

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ] ?
```

Trigger Setup

Press this softkey to display the dual setup menu. This menu enables you to adjust the trigger source, the retrigger mode, and the gate active polarity.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Setup**

Trigger Source

Press this softkey to display the trigger source menu. This menu enables you to adjust the trigger source between the front panel **Trigger** key, a trigger command sent over the HP-IB bus, or an external trigger applied to the PATTERN TRIG IN connector.

Default value: Ext

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **More (1 of 2)**, **Trigger**, **Trigger Source**

SCPI Commands:

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

```
[ :SOURce ] :RADio:WCDMa:STANdard:ARB:TRIGger [ :SOURce ] ?
```


Type

This softkey displays a menu that enables you to select the type of channel that you want to set up and insert multiple times into the Edit Channel Setup table editor. After you have set the channel parameters, and how many times you want the channel duplicated, press **Done** to insert the information into the table editor.

Default value: DPCH

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Edit Channel Setup**, **Insert Row**, **Multiple Channels**, **Type**

SCPI Commands:

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel INIT|APPend|<chan_num>,<chan_type>,
<symbol_rate>,<spread_code>,<power>,<symbol_offset>,
<TFCI>,<TPC>,<scramble_code>,RANDom|<data_val>,
<TFCI_power>,<TPC_power>,<pilot_power>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:
TABLE:CHANnel? <chan_num>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:CHANnel INIT|APPend|<chan_num>,<chan_type>,
<symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>,RANDom|
<data_val>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup:
TABLE:CHANnel? <chan_num>
```

User FIR

Press this softkey to display the catalog of FIR filter files stored in the signal generator's memory. You can select a custom filter from this catalog for your pre-modulation filter. Scroll through the listed files and when your selection is highlighted, press the **Select File** softkey. Notice that **User FIR** is shown in the **Filter** field of the display, and the file name is shown in the second line of the **Select** softkey.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **User FIR**

Waveform Statistics

Press this softkey to display the Waveform Statistics Menu. When this softkey is active, statistics are available for the selected waveform.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **Waveform Statistics**

WCDMA

Press this softkey to select the WCDMA pre-modulation filter in the Select (filter) menu.

In the Select (Filter) Menu

Pressing the **WCDMA** softkey selects this FIR filter and returns the Filter menu.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**, **Filter**, **Select**, **WCDMA**

SCPI Commands:

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer WCDMA
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :FILTer ?
```

W-CDMA (Rev 1.0–1.2)

This softkey is available *only* if both Option UND and Option 100 are installed.

Pressing this softkey accesses a menu of softkeys for generating data patterns that are formatted into a structure defined by the W-CDMA (Revision 1.0 – 1.2) standard.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**

W-CDMA Define

Press this softkey to display the W-CDMA Define menu for the current link, where you can define a W-CDMA signal.

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Define**

W-CDMA Off On

Press this softkey to enable the W-CDMA baseband signal generation. Setting **W-CDMA Off On** to **On** sets up the internal hardware to generate the currently selected W-CDMA signal. The **W-CDMA** and **I/Q** annunciators turn on in the display. Although the digital modulation is enabled with this softkey, the signal modulates the RF carrier only after you have set **Mod On/Off** to **On**.

Default value: Off

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Off On**

```
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB[:STATE] ON|OFF|1|0  
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB[:STATE]?
```

W-CDMA Select

Press this softkey to display the W-CDMA Select menu for the current link, where you can select a predefined channel setup, or select a stored custom W-CDMA state.

Default value: 1 DPCH

Softkey Location: Press **Mode**, **CDMA Formats**, **W-CDMA (Rev 1.0–1.2)**, **W-CDMA Select**

SCPI Commands:

```
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:  
SETup DPCH1|DPCH3|PERCH|PDPCH1|PDPCH3|  
PDPCH50|"<file name>"  
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?  
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:  
SETup DPCCH|DDPDCH1|DDPDCH2|DDPDCH3|"<file name>"  
[ :SOURCE ]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?
```


4 Operation

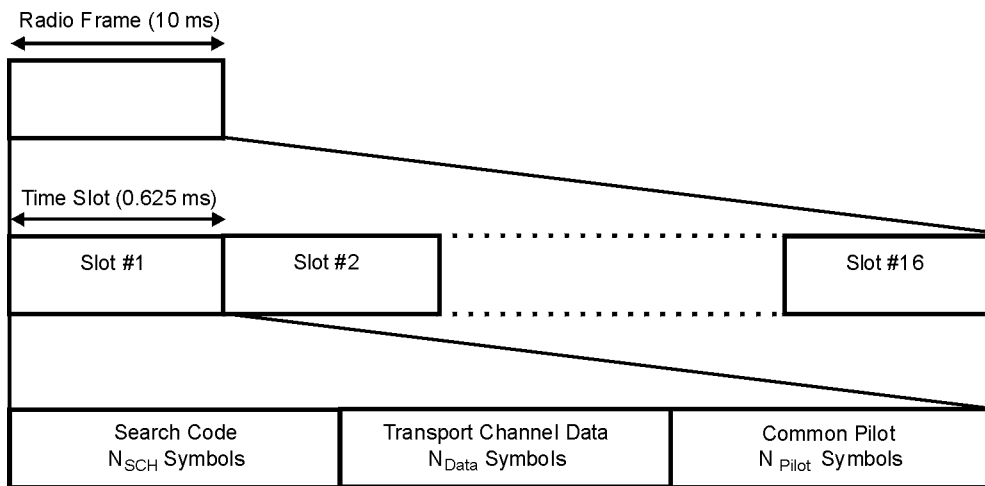
This chapter contains detailed information that will help you understand the operation of your Option 100 signal generator's W-CDMA (Rev. 1.0-1.2) personality.

W-CDMA Frame Structures

This section contains graphical representations of W-CDMA frame structures, with associated tables, for both forward and reverse link channels.

Forward Link

Figure 4-1 Perch Channel Frame Structure

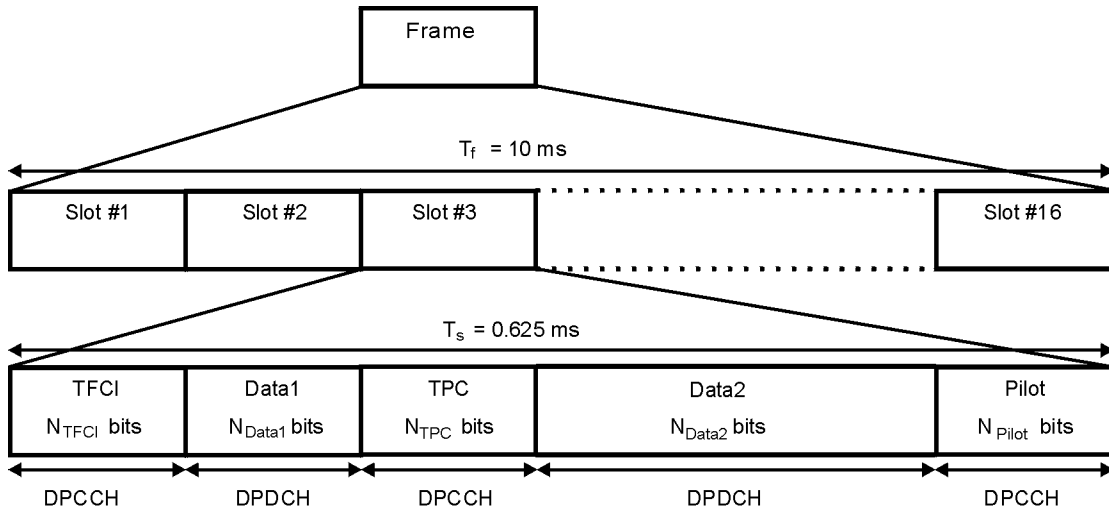


pk727b

Table 4-1 Lengths of Perch Channel Fields

Parameter	Symbols Per Slot
N_{pilot}	4
N_{data}	5
N_{SCH}	1

Figure 4-2 Forward Link Frame Structure



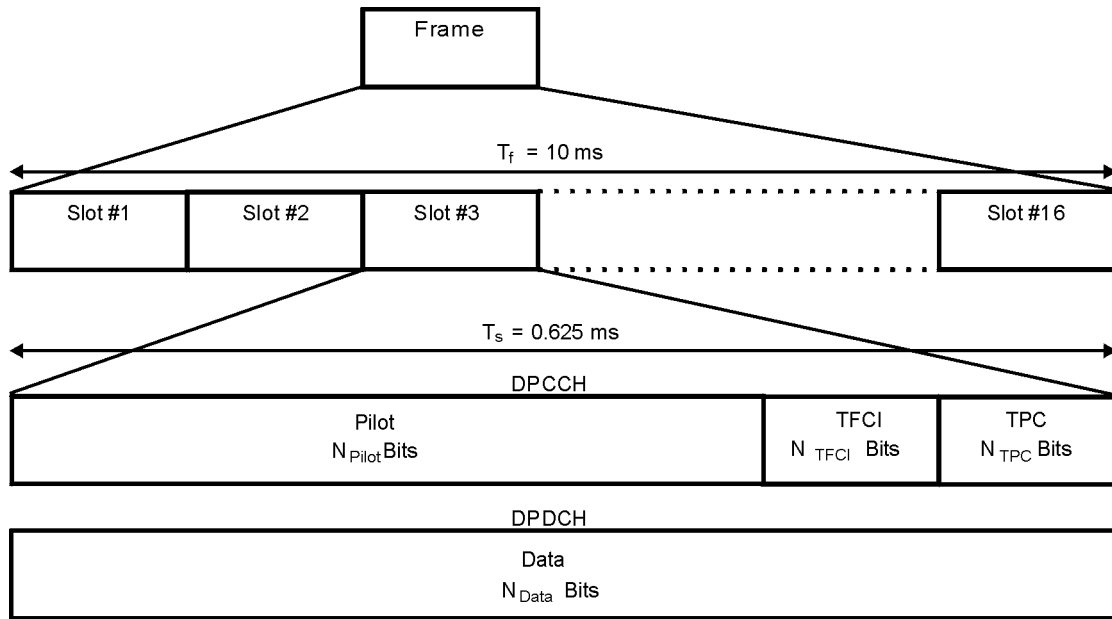
Pk729b

Table 4-2 Forward Link DPDCH and DPCCH Fields

Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
			DPDCH	DPCCH	TOTAL		N_{data1}	N_{data2}	N_{TFCI}	N_{TPC}	N_{pilot}
16	8	512	64	96	160	10	2	2	0	2	4
16	8	512	32	128	160	10	0	2	2	2	4
32	16	256	160	160	320	20	2	8	0	2	8
32	16	256	128	192	320	20	0	8	2	2	8
64	32	128	480	160	640	40	6	24	0	2	8
64	32	128	448	192	640	40	4	24	2	2	8
128	64	64	1120	160	1280	80	14	56	0	2	8
128	64	64	992	288	1280	80	6	56	8	2	8
256	128	32	2400	160	2560	160	30	120	0	2	8
256	128	32	2272	288	2560	160	22	120	8	2	8
512	256	16	4832	288	5120	320	62	240	0	2	16
512	256	16	4704	416	5120	320	54	240	8	2	16
1024	512	8	9952	288	10240	640	126	496	0	2	16
1024	512	8	9824	416	10240	640	118	496	8	2	16
2048	1024	4	20192	288	20480	1280	254	1008	0	2	16
2048	1024	4	20064	416	20480	1280	246	1008	8	2	16

Reverse Link

Figure 4-3 Reverse Link Frame Structure



Pk728b

Table 4-3 Reverse Link DPDCH Fields

Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame	Bits/Slot	N_{data}
16	16	256	160	10	10
32	32	128	320	20	20
64	64	64	640	40	40
128	128	32	1280	80	80
256	256	16	2560	160	160
512	512	8	5120	320	320
1024	1024	4	10240	640	640

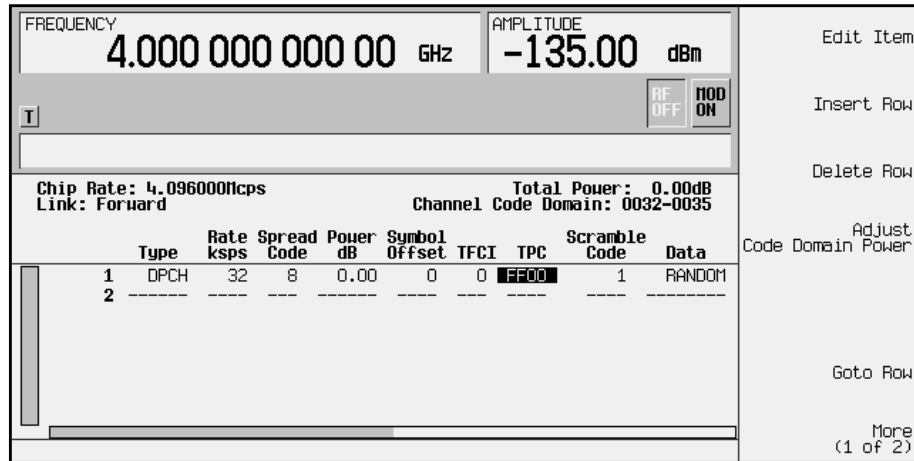
Table 4-4 Reverse Link DPCCH Fields

Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame	Bits/Slot	N_{pilot}	N_{TPC}	N_{TFCI}
16	16	256	160	10	6	2	2
16	16	256	160	10	8	2	0

Understanding TPC Values

TPC values determine how the transmit power of the receiving base or mobile station is going to vary. In the channel table editor, TPC values are represented in hexadecimal format to simplify entries and modifications. [Figure 4-4](#) shows the channel table editor with the TPC value, FF00, highlighted.

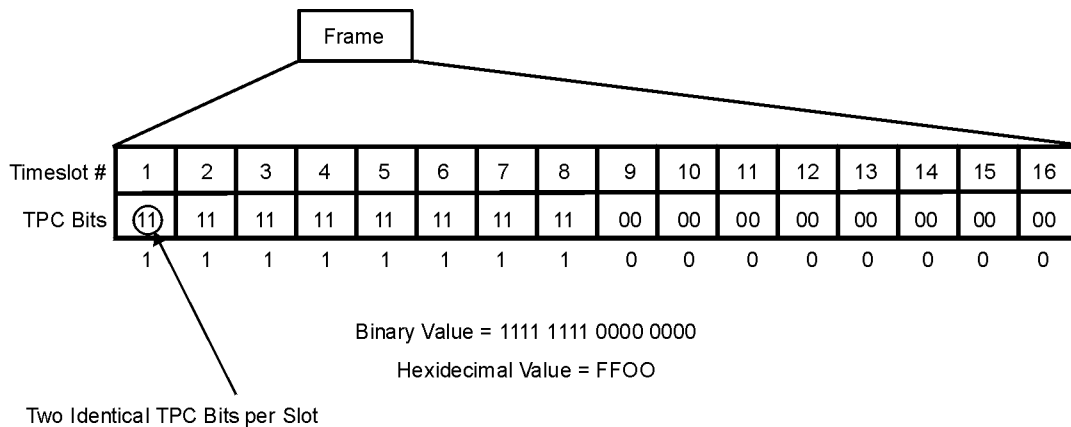
Figure 4-4 Highlighted TPC Value



Hexadecimal TPC values are converted to their binary equivalent. In this example, the value FF00 becomes 1111 1111 0000 0000. Notice that there are 16 digits in the binary TPC value. Because one frame contains 16 timeslots, one binary digit is assigned to each timeslot (see [Figure 4-5](#)). The assigned bit is then duplicated so that each timeslot contains two identical TPC bits: either 11 or 00.

The TPC bits 11 direct the receiving base or mobile station to increase its transmit power by an amount specified by the W-CDMA standard. Likewise, the TPC bits 00 cause the power to decrease by the same amount. In this example, the transmit power is increasing over timeslots 1 through 8 and decreasing over timeslots 9 through 16.

Figure 4-5 TPC Bits per Timeslot

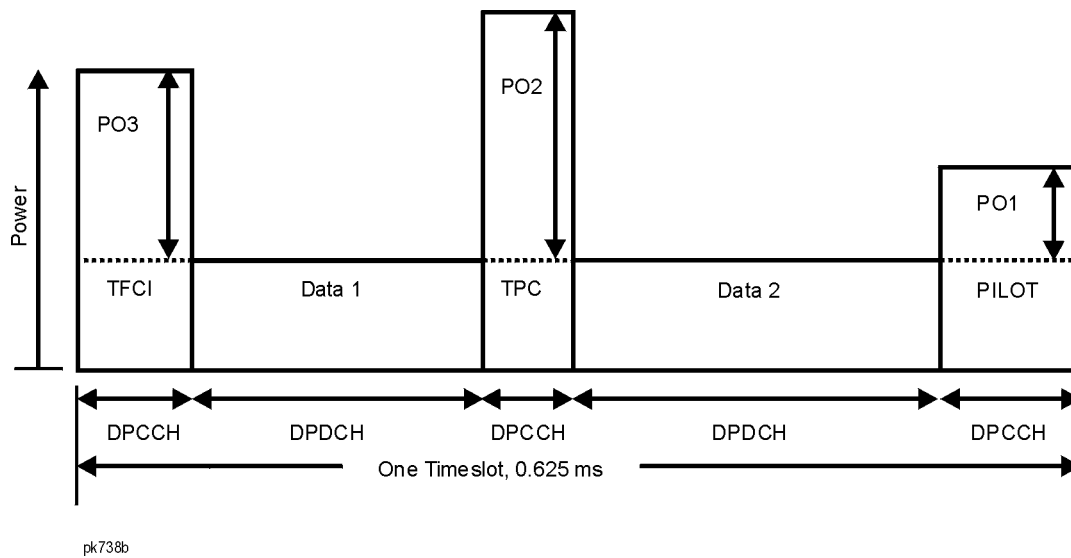


pk737b

Understanding TFCI, TPC, and Pilot Power Offsets

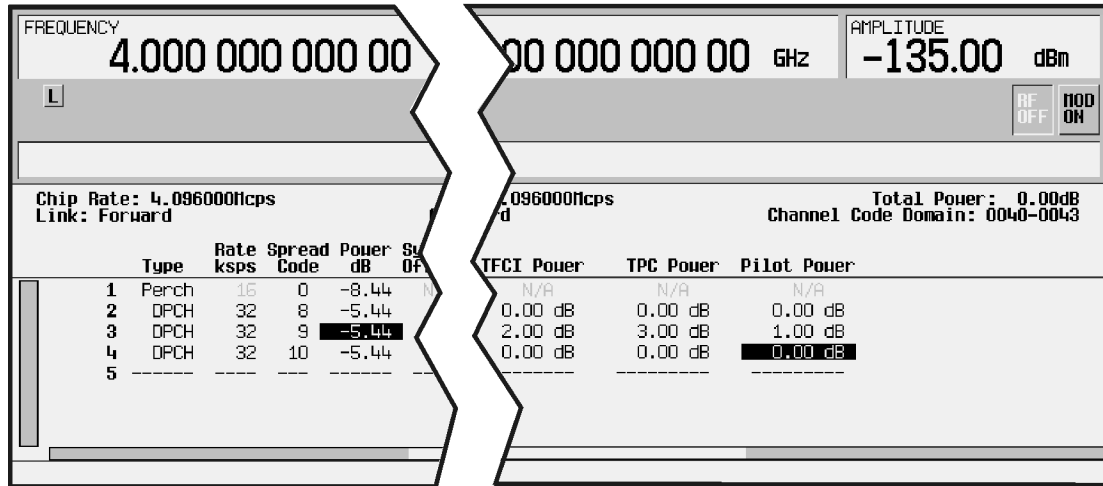
TFCI, TPC, and Pilot power offsets (PO), which are applied to forward link control channels (DPCCH), are relative to the transmit power for data channels (DPDCH). Usually, these offsets are set to a positive value (refer to [Figure 4-6](#)). The intent is to transmit control symbols at a higher level than data symbols to maintain the link between mobile and base. Because only the DPCCH transmit power is offset, the total transmit power is minimized and less noise is generated in the system.

Figure 4-6 TFCI, TPC, and Pilot Power



The display in [Figure 4-7](#) shows that the channel in row 3 of the table editor has the data transmit power (Power dB) set to -5.44 dB with the following offsets: TFCI Power set to 2.00 dB, TPC Power set to 3.00 dB, and Pilot Power set to 1.00 dB. Because of these offsets, the control symbols corresponding to TFCI, TPC, and Pilot will transmit at -3.44 dB, -2.44 dB, and -4.44 dB respectively.

Figure 4-7 Table Editor Showing TFCI, TPC, and Pilot Power Offsets



pk739b

Understanding Baseband Clipping

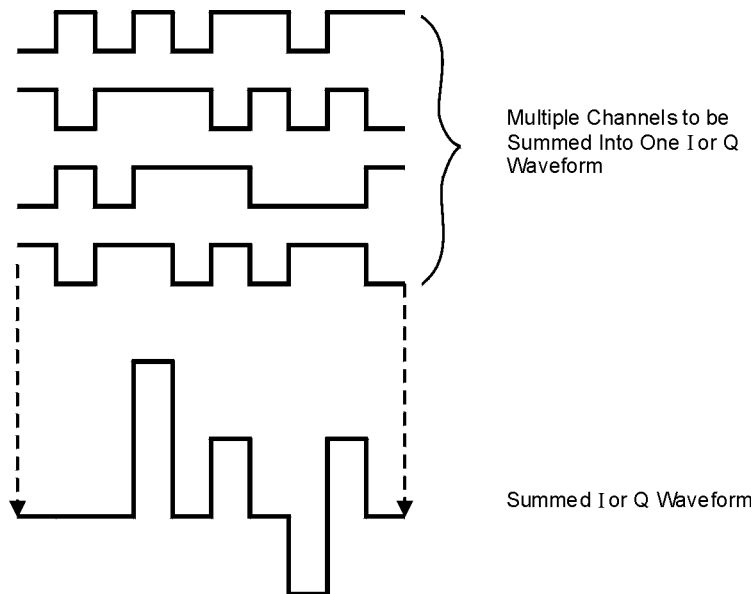
In a W-CDMA waveform, high power peaks can cause intermodulation distortion, which generates spectral regrowth (a condition that interferes with signals in adjacent frequency bands). The clipping function allows you to reduce high power peaks.

How Power Peaks Develop

To understand how clipping reduces high power peaks in a W-CDMA signal, it is important to know how the peaks develop as the signal is constructed.

A W-CDMA waveform is composed of an I waveform and a Q waveform. Often, these waveforms are the summation of multiple channels (refer to [Figure 4-8](#)). Whenever most or all of the individual channel waveforms simultaneously contain a bit in the same state (high or low), an unusually high power peak (negative or positive) occurs in the summed waveform. This does *not* happen frequently because the high and low states of the bits on these channel waveforms are random, which causes a cancelling effect.

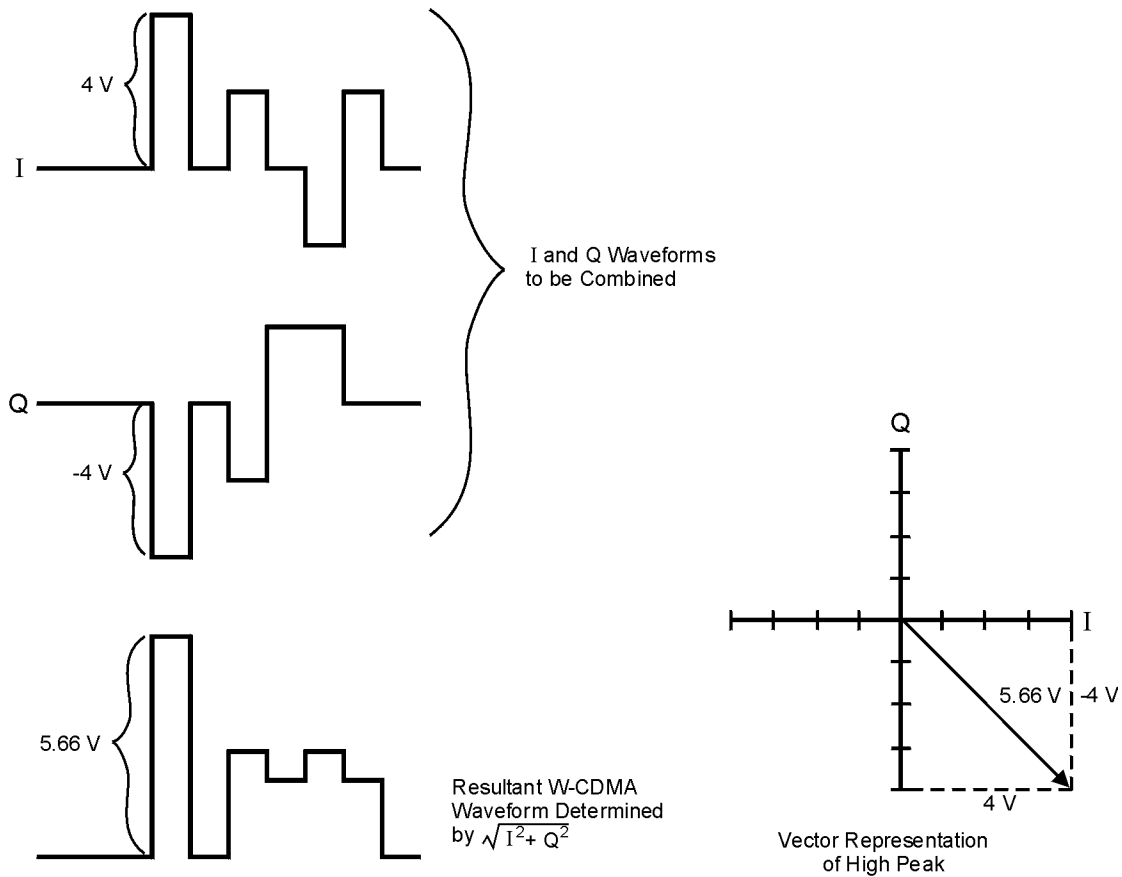
Figure 4-8 Multiple Channel Summing



pk722b

The I and Q waveforms are combined in the I/Q modulator to create an RF waveform. The magnitude of the RF envelope is determined by the equation $\sqrt{I^2+Q^2}$, where the squaring of I and Q always results in a positive value. Notice how positive and negative peaks that occurred simultaneously in the I and Q waveforms do not cancel each other, but combine to create an even greater peak (refer to Figure 4-9).

Figure 4-9 Combining the I and Q Waveforms

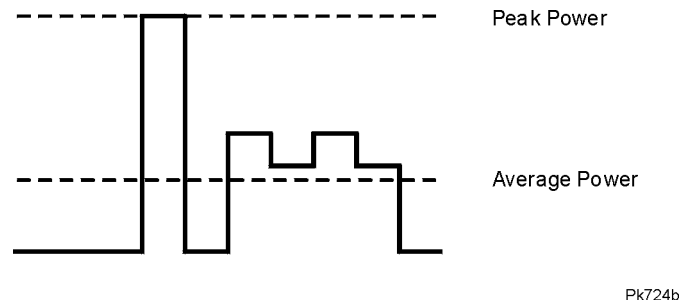


Pk723b

How Peaks Cause Spectral Regrowth

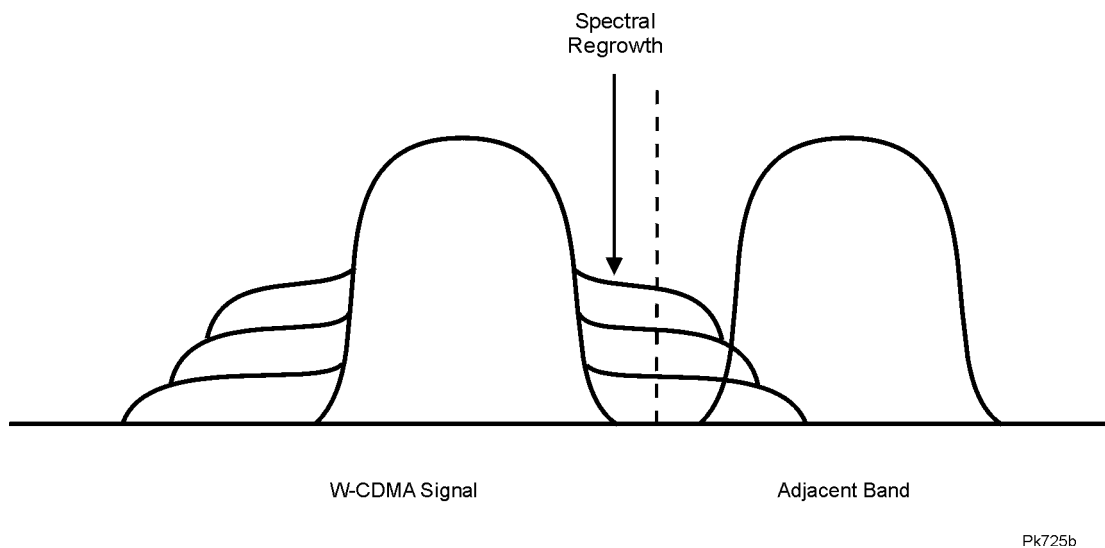
Because of the relative infrequency of high power peaks, a waveform will have a high peak-to-average power ratio (refer to [Figure 4-10](#)). Because a transmitter's power amplifier gain is set to provide a specific average power, high peaks can cause the power amplifier to move toward saturation. This causes intermodulation distortion, which generates spectral regrowth.

Figure 4-10 Peak-to-Average Power in the W-CDMA Waveform



Spectral regrowth is a range of frequencies that develops on each side of the carrier (similar to sidebands) and extends into the adjacent frequency bands (refer to [Figure 4-11](#)). Consequently, spectral regrowth interferes with communication in the adjacent bands. Clipping can provide a solution to this problem.

Figure 4-11 Spectral Regrowth Interfering with Adjacent Band

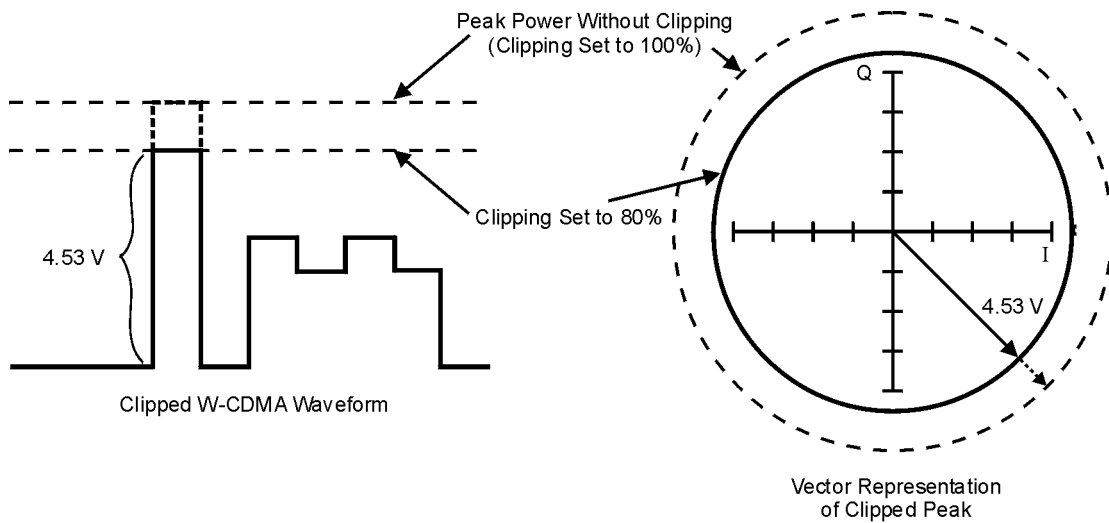


How Clipping Reduces Peak-to-Average Power

You can reduce peak-to-average power, and consequently spectral regrowth, by clipping the waveform to a selected percentage of its peak power (refer to [Figure 4-12](#) and [Figure 4-13](#)). The objective is to clip the waveform to a level that effectively reduces spectral regrowth, but does *not* compromise the integrity of the signal.

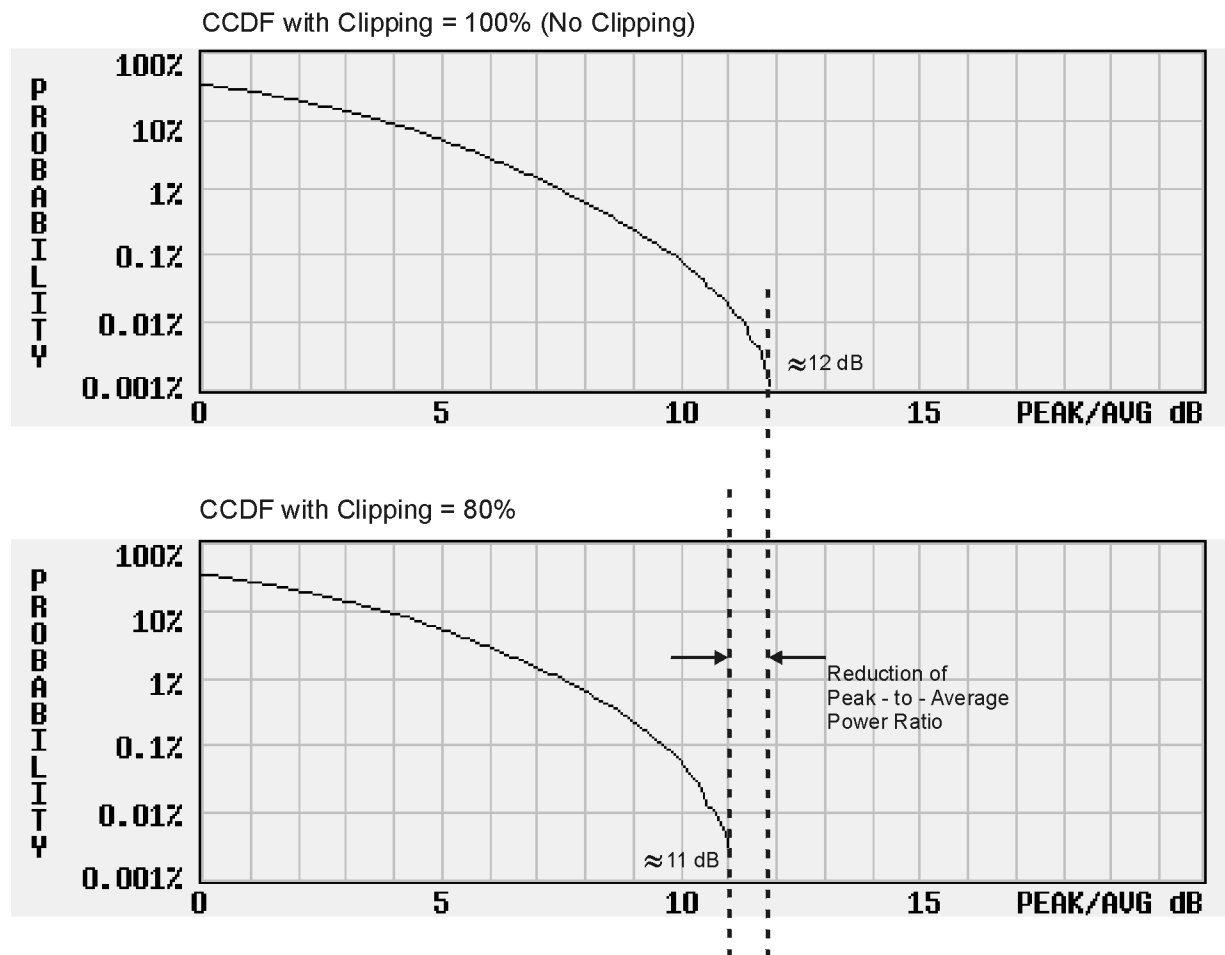
The lower you set the clipping value, the lower the peak power that is passed (or the more the signal is clipped). Often, the peaks can be clipped successfully without substantially interfering with the rest of the waveform. Data that might be lost in the clipping process is salvaged because of the error correction inherent in the W-CDMA system. If you clip too much of the waveform, however, lost data will be irrecoverable. You may have to try several clipping settings to find a percentage that works well.

Figure 4-12 Clipping the W-CDMA Waveform



Pk726b

Figure 4-13 Reduction of Peak-to-Average Power
Complementary Cumulative Distribution



Pk734b

Clipping Occurs Prior to FIR Filtering

Clipped waveforms have abrupt discontinuities, which can generate noise. To solve this problem, the clipping function is placed prior to FIR filtering. The FIR filter smooths any discontinuities in the clipped waveform and prevents noise.

How Clipping Differs from Symbol Offset

Another method used to control the power peak problem is to modify the symbol-offset values of the channels that comprise either the I or Q waveform. This is accomplished by using the signal generator's W-CDMA channel table editor. Unlike clipping, which reduces existing peaks, this method attempts to *prevent* peaks.

When multiple channels use a framing structure in which certain bits are designed to have the same state, these bits align and are summed to create power peaks. Offsetting the symbols in the channels prevents these bits from aligning, creating a cancelling effect. You can experiment with using the symbol offset method in combination with clipping.

5 Remote Programming

This chapter contains a brief overview of the Standard Commands for Programmable Instruments (SCPI) programming language (including a command syntax description) and a listing of all of the W-CDMA subsystem SCPI commands in alphabetical order. The descriptions include syntax requirements, ranges, restrictions, and status after a *RST.

Getting Started with SCPI

This section includes some basic reference material for the Standard Commands for Programmable Instruments language (SCPI). For more detailed information, see the programming guide.

Understanding Common Terms

The following terms are used throughout the remainder of this chapter.

Controller	A controller is any computer used to communicate with a SCPI instrument. A controller can be a personal computer, a minicomputer, or a plug-in card in a card cage. Some intelligent instruments can also function as controllers.
Instrument	An instrument is any device that implements SCPI. Most instruments are electronic measurement or stimulus devices, but this is not a requirement. Similarly, most instruments use an HP-IB or RS-232 interface for communication. The same concepts apply regardless of the instrument function or the type of interface used.
Program Message	A program message is a combination of one or more properly formatted SCPI commands. Program messages always go from a controller to an instrument. Program messages tell the instrument how to make measurements and output signals.
Response Message	A response message is a collection of data in specific SCPI formats. Response messages always go from an instrument to a controller or listening instrument. Response messages tell the controller about the internal state of the instrument and about measured values.
Command	A command is an instruction in SCPI. You combine commands to form messages that control instruments. In general, a command consists of mnemonics (keywords), parameters, and punctuation.
Query	A query is a special type of command. Queries instruct the instrument to make response data available to the controller. Query mnemonics always end with a question mark.

Standard Notation

This section uses several forms of notation that have specific meaning:

Command

Mnemonics Many commands have both a long and a short form and you must use either one or the other (SCPI does not accept a combination of the two). Consider the `FREQuency` command, for example. The short form is `FREQ` and the long form is `FREQUENCY`. This notation type is a shorthand to document both the long and short form of commands. SCPI is not case sensitive, so `fREquEnCy` is just as valid as `FREQUENCY`, but `FREQ` and `FREQUENCY` are the only valid forms of the `FREQuency` command.

Angle

Brackets Angle brackets indicate that the word or words enclosed represent something other than themselves. For example, `<new line>` represents the ASCII character with the decimal value 10. Similarly, `<END>` means that EOI is asserted on the HP-IB interface. Words in angle brackets have much more rigidly defined meaning than words shown in ordinary text. For example, this section uses the word “message” to talk about messages generally. But the bracketed words `<program message>` indicate a precisely defined element of SCPI. If you need them, you can find the exact definitions of words such as `<program message>` in a syntax diagram.

More About Commands

Query and Event Commands

You can query any value that you can set. For example, the presence of the signal generator `FREQuency:OFFSet` command implies that a `FREQuency:OFFSet?` also exists. If you see a command ending with a question mark, it is a query-only command. Some commands are events and cannot be queried. An event has no corresponding setting if it causes something to happen inside the instrument at a particular instant.

Implied Commands

Implied commands appear in square brackets. If you send a subcommand immediately preceding an implied command, but do not send the implied command, the instrument assumes you intend to use the implied command and behaves just as if you had sent it. Notice that this means that the instrument expects you to include any parameters required by the implied command. The following example illustrates equivalent ways to program the signal generator using explicit and implied commands.

An example signal generator command, `FREQuency[:CW]`, with and without the implied command:

<code>FREQuency:CW 500 MHz</code>	using explicit commands
<code>FREQuency 500 MHz</code>	using implied commands

Optional Parameters

Optional parameter names are enclosed in square brackets. If you do not send a value for an optional parameter, the instrument chooses a default value. The instrument's command dictionary documents the values used for optional parameters.

Command Syntax

Following the heading for each programming command entry is a syntax statement showing the proper syntax for the command. An example syntax statement is shown here:

```
POWer[:LEVel] MAXimum|MIN
```

Syntax statements read from left to right. In this example, the `[:LEVel]` portion of the statement immediately follows the `POWer` portion of the statement with no separating space. A separating space is legal only between the command and its argument. In this example, the portion following the `[:LEVel]` portion of the statement is the argument. Additional conventions used in the syntax statements are defined as follows:

- Italics are used to symbolize a program code parameter or query response.
- ::= means “is defined as.”
- | (vertical bar) indicates a choice of one element from a list. For example, `<A> | ` indicates `<A>` or `` but not both.
- {} (braces or curly brackets) indicate that the enclosed items may be included zero or more times.
- [] (square brackets) indicate that the enclosed items are optional.
- Upper-case lettering indicates that the upper-case portion of the command is the minimum required for the command. For example, in the command `FREQuency`, `FREQ` is the minimum requirement.
- Lower-case lettering indicates that the lower-case portion of the command is optional; it can either be included with the upper-case portion of the command or omitted. For example, in the command `FREQuency`, either `FREQ`, or `FREQUENCY` is correct.
- ? after a subsystem command indicates that the command is a query.

W-CDMA Subsystem SCPI Command Reference (Options UND and 100 Required)

The W-CDMA subsystem SCPI commands are used to set the controls and the parameters associated with W-CDMA (Rev 1.0–1.2) communications standard via a remote controller. These commands are only for signal generators with both Options UND and 100.

Apply Waveform

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :TABLe :APPLy  
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVERse :SETup :TABLe :APPLy
```

Execute this command to generate a W-CDMA signal based on the current values in the W-CDMA channel setup table editor.

ARB Reference Internal External

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

Execute this command to select either an internal or external reference for the waveform clock. If external is selected, the external frequency *must* be entered (see the Reference Frequency command) and the signal must be applied to the BASEBAND GEN REF IN connector.

At *RST, this value is set to Internal.

Channel Setup

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLe :CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <symbol_offset> ,  
<TFCl> , <TPC> , <scramble_code> , RANDom | <data_val> ,  
<TFCl_power> , <TPC_power> , <pilot_power>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup :  
TABLe :CHANnel ? <chan_num>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVERse :SETup :  
TABLe :CHANnel INIT | APPend | <chan_num> , <chan_type> ,  
<symbol_rate> , <spread_code> , <power> , <TFCl> , <TPC> ,  
RANDom | <data_val>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVERse :SETup :  
TABLe :CHANnel ? <chan_num>
```

These commands define the channel parameters of the W-CDMA signal. Use `INIT` to clear the table editor and define the parameters for the first channel. Use `APPEND` to add new channels. Parameters include:

Parameter	Definition	*RST Value
<chan_num>	specifies the channel number to modify	N/A
<chan_type>	sets the channel type	DPCH
<symbol_rate>	sets the symbol rate	32 ksps
<spread_code>	sets the spread code	8
<power>	sets the power level for the channel	0.00 dB
<symbol_offset>	sets the symbol offset for the channel	0
<TFICI>	transport format combination indicator	0
<TPC>	transmit power control	AAAA
<scramble_code>	sets the scramble code value for the inserted channels	1
<data_val>	the transmitted data	N/A
<TFICI_power>	power offset	0.00 dB
<TPC_power>	power offset	0.00 dB
<pilot power>	power offset	0.00 dB

Chip Rate

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:CRATe <value>
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:CRATe?
```

Execute this command to set the chip rate. Choices for the variable <value> are 4.096 Mcps, 8.192 Mcps, and 16.384 Mcps.

At *RST, this value is set to 4.096000 Mcps.

Clipping Level

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:CLIPping <10-100%>
```

```
[ :SOURce ]:RADio:WCDMa:STANdard:ARB:CLIPping?
```

Execute this command to clip (limit) the modulation level of the baseband waveform to a percentage of full scale. A level of 100.0% equates to no clipping.

At *RST, this value is set to 100.0%.

Code Domain Power

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETUp :TABLe :  
PADJust EQUal | SCALe
```

Execute this command to set the code domain power. Available in Forward Link only.

- EQUal | SCALe - code domain power settings

EQUal - sets the channel power levels so that all channels are of equal energy per bit and the total power equals 0 dBm.

SCALe - scales all of the current channel powers so that the total power equals 0 dB while keeping the previous power ratios between the individual channels.

Custom W-CDMA State, Store

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETUp :STORE "<file name>"
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETUp :STORE "<file name>"
```

Execute this command to store the current custom W-CDMA state into a designated file name. Afterward, you can recall this custom state from the signal generator's memory by executing the command `[:SOURce] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETUp "<file name>"`, or `[:SOURce] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETUp "<file name>"` with the appropriate file name in place of the variable.

Along with the contents of the W-CDMA channel table editor (channel types, spread code, scramble code, power levels, symbol rate, symbol offset, and data pattern), this command stores the following instrument state information to the memory catalog:

- FIR filter
- FIR filter file name
- FIR filter alpha and BbT
- FIR filter channel (EVM or ACP)
- IQ Mapping
- Link
- Chip rate
- ARB reconstruction filter
- ARB reference clock source (internal or external)
- Clipping
- Forward link TFCI on/off
- Reverse link TFCI on/off
- Reverse link SDDPCH
- Reverse link scramble code

External Trigger Delay State

```
[ :SOURCE ] : RADio : WCDMa : STANdard : ARB : TRIGger [ : SOURCE ] :  
EXTernal : DELay : STATE ON | OFF | 1 | 0
```

```
[ : SOURCE ] : RADio : WCDMa : STANdard : ARB : TRIGger [ : SOURCE ] :  
EXTernal : DELay : STATE ?
```

Execute this command to set the operating state for the external trigger delay. The choices are On or Off.

At *RST, this value is set to Off.

External Trigger Delay Time

```
[ : SOURCE ] : RADio : WCDMa : STANdard : ARB : TRIGger [ : SOURCE ] :  
EXTernal : DELay <value>
```

```
[ : SOURCE ] : RADio : WCDMa : STANdard : ARB : TRIGger [ : SOURCE ] :  
EXTernal : DELay ?
```

Execute this command to set the external trigger delay time. The range of values allowed for the variable <value> is 2.000 microseconds through 3600 seconds.

At *RST, this value is set to 2.000 msec.

External Trigger Polarity

```
[ : SOURCE ] : RADio : WCDMa : STANdard : ARB : TRIGger [ : SOURCE ] :  
EXTernal : SLOPe POSitive | NEGative
```

```
[ : SOURCE ] : RADio : WCDMa : STANdard : ARB : TRIGger [ : SOURCE ] :  
EXTernal : SLOPe ?
```

Execute this command to set the polarity of the external trigger. The choices are positive or negative.

At *RST, this value is set to negative.

Filter Alpha

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:ALPHa <value>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:ALPHa?
```

Execute this command to change the Nyquist or root Nyquist filter's alpha value. The acceptable range for the variable `<value>` is 0.000 through 1.000.

This command is effective only *after* choosing a root Nyquist or Nyquist filter. It does not have an effect on other types of filters.

At *RST, this value is set to 0.500.

Filter BbT

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:BBT <value>
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:BBT?
```

Execute this command to change the bandwidth-multiplied-by-bit-time (BbT) filter parameter. The acceptable range for the variable `<value>` is 0.000 through 1.000.

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

At *RST, this value is set to 0.500.

Filter Optimization

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:CHANnel EVM|ACP
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer:CHANnel?
```

Execute this command to optimize the filter for minimized error vector magnitude (select EVM) or to minimized adjacent channel power (select ACP). The EVM selection provides the most ideal passband. The ACP selection improves stopband rejection.

This feature only applies to root Nyquist, Nyquist, and Gaussian filters.

At *RST, this value is set to EVM.

Filter Selection

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer RNYQuist|NYQuist|GAUSSsian|
RECTangle|WCDMA|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|"User FIR"
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?
```

Execute this command to select the pre-modulation filter type. The choices are:

- RNYQuist - root Nyquist filter
- NYQuist - Nyquist filter
- GAUSSsian - Gaussian filter
- RECTangle - Rectangle filter
- WCDMA - 0.22 Nyquist filter optimized for ACP
- IS95 - Standard IS-95 filter
- IS95_MOD - a modified version of an IS-95 filter which meets the IS-95 error function for improved adjacent channel performance.
- IS95_EQ - a modified version of an IS-95 filter with an equalizer which provides base station phase equalization for the transmit signal path.
- IS95_MOD_EQ - a modified version of an IS-95 filter which meets the IS-95 error function for improved adjacent channel performance with an equalizer which provides base station phase equalization for the transmit signal path.
- "<file name>" - any filter file that you have either created externally and downloaded into memory, or that you have created internally in the Define User FIR menu and then subsequently stored.

At *RST, this value is set to WCDMA.

Gate Active

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

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE:GATE:ACTive?
```

Execute this command to toggle the polarity of the “through” or active state of a gated trigger signal. The choices are low or high. Gate active low will output the signal while the gate is low at the PATTERN TRIG IN connector. Gate active high has the opposite effect, outputting the signal while the signal level at the PATTERN TRIG IN connector is in a high state.

I/Q Mapping

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:IQMap NORMal|INVert|INVerted
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:IQMap?
```

Execute this command to select whether the I/Q outputs will be normal or inverted.

At *RST, this value is set to Normal.

Link Direction

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK FORWard|REVerse
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:LINK?
```

Use this command to select a W-CDMA forward or reverse link channel configuration.

Reconstruction Filter

```
[ :SOURce]:RADio:ARB:RFILter <value>|THROUGH
```

```
[ :SOURce]:RADio:ARB:RFILter?
```

Execute this command to modify the reconstruction filter. You may choose a filter with a cutoff frequency of 250.0 kHz, 2.500 MHz, 8.000 MHz or no filter (Through). Acceptable values for the variable <value> are 250.0 kHz, 2.500 MHz, or 8.000 MHz.

At *RST, this value is set to 2.500 MHz.

Reference Frequency

```
[ :SOURce]:RADio:ARB:CLOCK:REFerence:EXTernal:FREQuency <value>
```

```
[ :SOURce]:RADio:ARB:CLOCK:REFerence:EXTernal:FREQuency?
```

This command sets the reference frequency of the external clock. It is only effective when you are using an external ARB reference applied to the BASEBAND GEN REF IN connector. The acceptable range for the variable <value> is 250.0000 kHz to 20.0000000 MHz.

At *RST, this value is set to 10.0000000 MHz.

Retrigger Mode State

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :RETRigger ON | OFF | 1 | 0
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :RETRigger?
```

This command sets the operating state of the retrigger mode. The choices are On or Off.

At *RST, this value is set to On.

Scramble Code

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SCRamble <value>
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SCRamble?
```

Execute this command to enter the value that you want for the scramble code all reverse link channels.

At *RST, this value is set to 1.

Second DPDCH Setup

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SDPDch I | Q
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SDPDch?
```

Execute this command to set the second DPDCH channel to I or Q. Subsequent channels will alternate accordingly between I and Q.

At *RST, this value is set to Q.

TFCI Field State

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :TFCI ON | OFF | 1 | 0
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :TFCI?
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :TFCI ON | OFF | 1 | 0
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :TFCI?
```

Execute this command to turn the TFCI (Transport Format Combination Indicator) field On or Off for all the channels in the current table editor.

At *RST, this value is set to On.

Trigger Source

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

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]?
```

Execute this command to set the trigger source. The choices include the front panel **Trigger** key, a trigger command sent over the HP-IB bus, or an external trigger applied to the PATTERN TRIG IN connector.

At *RST, this value is set to Ext.

Trigger Type

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE CONTInuous|SINGle|GATE
```

```
[ :SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE?
```

Execute this command to set the trigger type. The choices are continuous, single, gated, and when a waveform sequence is active, segment advance.

At *RST, this value is set to Continuous.

User FIR Definition

```
MEMory:DATA:FIR "<file name>",<osr>,<coefficient>{,<coefficient>}
```

```
MEMory:DATA:FIR? "<file name>"
```

Execute this command to define User FIR filters. A maximum filter length of 1024 taps is allowed with a maximum oversampling ratio of 32. An FIR filter selected for use in W-CDMA, however, cannot have more than 256 taps, so select the number of symbols and the oversample ratio accordingly. Examples of using the FIR table editor are provided in [Chapter 2, "Using Functions."](#)

Setting the Oversample Ratio

The oversample ratio (OSR) is the number of filter taps per symbol. Acceptable values range from 1 through 32; the maximum combination of symbols and oversampling ratio allowed by the table editor is 1024. The instrument hardware, however, is actually limited to 32 symbols, an oversample ratio between 4 and 16, and 256 coefficients. So if you enter more than 32 symbols or 256 coefficients, the instrument will be unable to use the filter. If the oversample ratio is different from the internal, optimally selected one, then the filter will be automatically resampled to an optimal oversample ratio.

W-CDMA Setup

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup
DPCH1 | DPCH3 | PERCH | PDPCH1 | PDPCH3 | PDPCH50 | "<file name>"
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :FORWard :SETup?
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETup
DPCCH | DDPDCH1 | DDPDCH2 | DDPDCH3 | "<file name>"
```

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB :LINK :REVerse :SETup?
```

Execute this command to select one of the pre-defined W-CDMA channel configurations. The choices include:

- DPCH1 | DPCH3 | PERCH | PDPCH1 | PDPCH3 | PDPCH50 - **forward link channel type**
 - DPCH1 - a single DPCH forward link channel
 - DPCH3 - a three DPCH forward link channel
 - PERCH - a single perch forward link channel
 - PDPCH1 - a perch plus one DPCH forward link channel
 - PDPCH3 - a perch plus three DPCH forward link channels
 - PDPCH50 - a perch plus fifty DPCH forward link channels
- DPCCH | DDPDCH1 | DDPDCH2 | DDPDCH3 - **reverse link channel type**
 - DPCCH - a single DPCCH reverse link channel
 - DDPDCH1 - a DPCCH plus one DPDCH reverse link channel
 - DDPDCH2 - a DPCCH plus two DPDCH reverse link channels
 - DDPDCH3 - a DPCCH plus three DPDCH reverse link channels
- "<file name>" - a user-defined W-CDMA state file previously stored in the signal generator's non-volatile memory.

W-CDMA State

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

```
[ :SOURce ] :RADio :WCDMa :STANdard :ARB [ :STATe ] ?
```

Execute this command to enable or disable the W-CDMA capability. The choices are On (1) or Off (0). Executing the command `[:SOURce] :RADio :WCDMa :STANdard :ARB [:STATe] ON` sets up the internal hardware to generate the currently selected W-CDMA signal selection. The W-CDMA and I/Q annunciators are turned on in the display.

Although the digital modulation is enabled with this command, the modulation is not present on the RF carrier until you have executed the command:

```
OUTPut :MODulation [ :STATe ] ON.
```

At *RST, this value is set to Off.

6 Programming Command Cross-Reference

This chapter lists the W-CDMA softkeys and 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 - W-CDMA Softkeys

Key	SCPI Command
1 DPCH	[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard: SETup DPCH1 [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?
2.500 MHz	[:SOURce]:RADio:ARB:RFILter 2.500 MHz [:SOURce]:RADio:ARB:RFILter?
3 DPCH	[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard: SETup DPCH3 [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?
8 ksps 16 ksps 32 ksps 64 ksps 128 ksps 256 ksps 512 ksps 1024 ksps	[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLe:CHANnel INIT APPend <chan_num>, <chan_type>, <symbol_rate>, <spread_code>, <power>, <symbol_offset>, <TFCl>, <TPC>, <scramble_code>, RANDom <data_val>, <TFCl_power>, <TPC_power>, <pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLe:CHANnel? <chan_num> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLe:CHANnel INIT APPend <chan_num>, <chan_type>, <symbol_rate>, <spread_code>, <power>, <TFCl>, <TPC>, RANDom <data_val> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLe:CHANnel? <chan_num>
8.000 MHz	[:SOURce]:RADio:ARB:RFILter 8.0 MHz [:SOURce]:RADio:ARB:RFILter?
250.0 kHz	[:SOURce]:RADio:ARB:RFILter 250 kHz [:SOURce]:RADio:ARB:RFILter?
Adjust Code Domain Power	[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLe:PADJust EQUal SCALE
Apply Channel Setup	[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLe:APPLy [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLe:APPLy
ARB Reference Ext Int	[:SOURce]:RADio:ARB:CLOCK:REFerence[:SOURce] INTernal EXTernal [:SOURce]:RADio:ARB:CLOCK:REFerence[:SOURce]?
Bus	[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce] BUS [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]?

Key	SCPI Command
Channels	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel INIT APPend <chan_num>, <chan_type>, <symbol_rate>, <spread_code>, <power>, <symbol_offset>, <TFCI>, <TPC>, <scramble_code>, RANDom <data_val>, <TFCI_power>, <TPC_power>, <pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel? <chan_num></pre>
Chip Rate	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:CRATe <value> [:SOURce]:RADio:WCDMa:STANdard:ARB:CRATe?</pre>
Clipping Level	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:CLIPping <10-100%> [:SOURce]:RADio:WCDMa:STANdard:ARB:CLIPping?</pre>
Continuous	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE CONT [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE?</pre>
Custom W-CDMA State	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard: SETup "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup? [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SETup "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>
Define User FIR	<pre>:MEMory:DATA:FIR "<file name>","osr, coefficient{,coefficient} :MEMory:DATA:FIR? "<file name>"</pre>
DPCCH	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SETup DPCCH [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>
DPCCH + 1 DPDCH	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SETup DDPDCH1 [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>
DPCCH + 2 DPDCH	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SETup DDPDCH2 [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>
DPCCH + 3 DPDCH	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SETup DDPDCH3 [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>

Key	SCPI Command
DPCH	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<symbol_offset>, <TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>, <TFCI_power>,<TPC_power>,<pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel? <chan_num></pre>
DPDCH Channels	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>,RANDOM <data_val> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLE:CHANnel? <chan_num></pre>
Edit Channel Setup	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<symbol_offset>, <TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>, <TFCI_power>,<TPC_power>,<pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel? <chan_num> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>, RANDOM <data_val> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLE:CHANnel? <chan_num></pre>
Equal Energy per Symbol	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:PADJust EQUal</pre>
Ext	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce] EXT [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]?</pre>
Ext Delay Off On	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]: EXTernal:DElay:STATe ON OFF 1 0 [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]: EXTernal:DElay:STATe?</pre>
Ext Delay Time	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]: EXTernal:DElay <value> [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]: EXTernal:DElay?</pre>
Ext Polarity Neg Pos	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]: EXTernal:SLOPe POSitive NEGative [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger[:SOURce]: EXTernal:SLOPe?</pre>

Key	SCPI Command
Filter Alpha	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER:ALPHA <value> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER:ALPHA?
Filter BbT	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER:BBT <value> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER:BBT?
First Spread Code	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:FORWARD:SETUP:TABLE:CHANNEL INIT APPEND <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<symbol_offset>,<TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>,<TFCI_power>,<TPC_power>,<pilot_power> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:FORWARD:SETUP:TABLE:CHANNEL? <chan_num>
Gate Active	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER:TYPE:GATE:ACTIVE LOW HIGH [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER:TYPE:GATE:ACTIVE?
Gated	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER:TYPE GATE [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER:TYPE?
Gaussian	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER GAUSSIAN [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER?
Insert DPDCH	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:REVERSE:SETUP:TABLE:CHANNEL INIT APPEND <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>,RANDOM <data_val> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:REVERSE:SETUP:TABLE:CHANNEL? <chan_num>
I/Q Mapping Normal Invert	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:IQMap NORMAL INVERT INVERTED [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:IQMap?
IS-95	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER IS95 [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER?
IS-95 Mod	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER IS95_MOD [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER?
IS-95 Mod w/EQ	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER IS95_MOD_EQ [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER?
IS-95 w/EQ	[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER IS95_EQ [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:FILTER?

Key	SCPI Command
Link Forward Reverse	[:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK FORWard REVerse [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK?
Modify All Scramble Codes	[:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel INIT APPend <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<symbol_offset>,<TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>,<TFCI_power>,<TPC_power>,<pilot_power> [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel? <chan_num>
Multiple Channels	[:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel INIT APPend <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<symbol_offset>,<TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>,<TFCI_power>,<TPC_power>,<pilot_power> [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel? <chan_num>
Nyquist	[:SOURCE]:RADio:WCDMa:STANdard:ARB:FILTer NYQuist [:SOURCE]:RADio:WCDMa:STANdard:ARB:FILTer?
Optimize FIR For EVM ACP	[:SOURCE]:RADio:WCDMa:STANdard:ARB:FILTer:CHANnel EVM ACP [:SOURCE]:RADio:WCDMa:STANdard:ARB:FILTer:CHANnel?
Oversample Ratio	:MEMory:DATA:FIR "<file name>",<osr>,<coefficient>{,<coefficient>} :MEMory:DATA:FIR? "<file name>"
Perch	[:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup PERCH [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup? [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel INIT APPend <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<symbol_offset>,<TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>,<TFCI_power>,<TPC_power>,<pilot_power> [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel? <chan_num>
Perch + 1 DPCH	[:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup PDPCH1 [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?
Perch + 3 DPCH	[:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup PDPCH3 [:SOURCE]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?

Key	SCPI Command
Perch + 50 DPCH	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup PDPCH50 [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup?</pre>
Power	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel INIT APPend <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<symbol_offset>,<TFCI>,<TPC>,<scramble_code>,RANDom <data_val>,<TFCI_power>,<TPC_power>,<pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:CHANnel? <chan_num> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup:TABLE:CHANnel INIT APPend <chan_num>,<chan_type>,<symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>,<TFCI_power>,<TPC_power>,RANDom <data_val> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVERSE:SETup:TABLE:CHANnel? <chan_num></pre>
Reconstruction Filter	<pre>[:SOURce]:RADio:ARB:RFILTer 250 kHz 2.5 MHz 8.0 MHz THROUGH [:SOURce]:RADio:ARB:RFILTer?</pre>
Rectangle	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer RECTangle [:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?</pre>
Reference Frequency	<pre>[:SOURce]:RADio:ARB:CLOCK:REFerence:EXTernal:FREQuency <value> [:SOURce]:RADio:ARB:CLOCK:REFerence:EXTernal:FREQuency?</pre>
Restore Default Filter	<pre>[:SOURce]:RADio:WCDMa:ARB:FILTer WCDMA [:SOURce]:RADio:WCDMa:ARB:FILTer?</pre>
Retrigger Mode Off On	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:RETRigger ON OFF 1 0 [:SOURce]:RADio:WCDMa:STANdard:ARB:RETRigger?</pre>
Root Nyquist	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer RNYquist [:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?</pre>
Scale To 0dB	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup:TABLE:PADJust SCALE</pre>

Key	SCPI Command
Scramble Code	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<symbol_offset>, <TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>, <TFCI_power>,<TPC_power>,<pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel? <chan_num> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SCRamble <value> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SCRamble?</pre>
Second DPDCH I Q	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SDPDch I Q [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SDPDch?</pre>
Select	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer RNYQuist NYQuist GAUSSian RECTangle WCDMA "User FIR" [:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?</pre>
Select File	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer? [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard: SETup "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup? [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse: SETup "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>
Single	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE SINGLE [:SOURce]:RADio:WCDMa:STANdard:ARB:TRIGger:TYPE?</pre>
Spread Only	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<symbol_offset>, <TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>, <TFCI_power>,<TPC_power>,<pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel? <chan_num></pre>
Store Custom W-CDMA State	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: STORE "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: STORE "<file name>"</pre>
Store to File	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: STORE "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: STORE "<file name>"</pre>

Key	SCPI Command
Symbol Rate	<pre>[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:FORWARD:SETUP: TABLE:CHANNEL INIT APPEND <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<symbol_offset>, <TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>, <TFCI_power>,<TPC_power>,<pilot_power> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:FORWARD:SETUP: TABLE:CHANNEL? <chan_num> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:REVERSE:SETUP: TABLE:CHANNEL INIT APPEND <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>,RANDOM <data_val> [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:REVERSE:SETUP: TABLE:CHANNEL? <chan_num></pre>
TCFI Field Off On	<pre>[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:FORWARD: TFCI ON OFF 1 0 [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:FORWARD:TFCI? [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:REVERSE: TFCI ON OFF 1 0 [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:LINK:REVERSE:TFCI?</pre>
Through	<pre>[:SOURCE]:RADIO:ARB:RFILTER THROUGH [:SOURCE]:RADIO:ARB:RFILTER?</pre>
Trigger	<pre>[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER: TYPE CONTINUOUS SINGLE GATE [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER:TYPE?</pre>
Trigger Key	<pre>[:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER[:SOURCE] KEY [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER[:SOURCE]?</pre>
Trigger Source	<pre>[:SOURCE]:RADIO:WCDMA:STANDARD:ARB: TRIGGER[:SOURCE] KEY EXT BUS [:SOURCE]:RADIO:WCDMA:STANDARD:ARB:TRIGGER[:SOURCE]?</pre>

Key	SCPI Command
Type	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<symbol_offset>, <TFCI>,<TPC>,<scramble_code>,RANDOM <data_val>, <TFCI_power>,<TPC_power>,<pilot_power> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup: TABLE:CHANnel? <chan_num> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLE:CHANnel INIT APPend <chan_num>,<chan_type>, <symbol_rate>,<spread_code>,<power>,<TFCI>,<TPC>,RANDOM <data_val> [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup: TABLE:CHANnel? <chan_num></pre>
WCDMA	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer WCDMA [:SOURce]:RADio:WCDMa:STANdard:ARB:FILTer?</pre>
W-CDMA Off On	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB[:STATe] ON OFF 1 0 [:SOURce]:RADio:WCDMa:STANdard:ARB[:STATe]?</pre>
W-CDMA Select	<pre>[:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup DPCH1 DPCH3 PERCH PDPCH1 PDPCH3 PDPCH50 "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:FORWard:SETup? [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup DPCCH DDPDCH1 DDPDCH2 DDPDCH3 "<file name>" [:SOURce]:RADio:WCDMa:STANdard:ARB:LINK:REVerse:SETup?</pre>

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