

## **Reference**

**TLS 216**  
**Logic Scope**  
**070-8833-00**

## To Set Up Using a Menu:

1 Press any of the front panel menu buttons.

2 Select an item from the main (bottom) menu.

3 Select an item from the side menu, if displayed.

4 Adjust menu item values using the general purpose knob or by entering numbers on the keypad.

## To Display Help On Screen:

1 Press HELP button.

2 Now turn any knob or press any button and read a description of it on the display. Press HELP button again to exit help.

## To Save a Hardcopy to the File System:

1 Press SHIFT, and then press HARDCOPY.

2 Press Format in the main menu, and select a Hardcopy Format from the side menu.

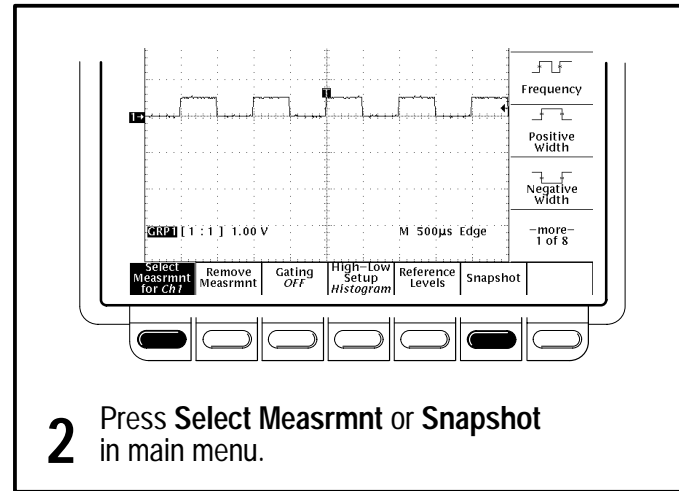
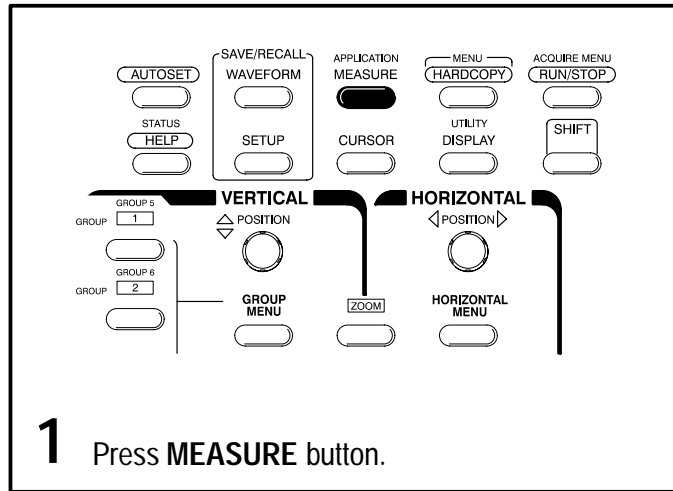
3 Press Port in the main menu, press File in the side menu, and then press CLEAR MENU.

4 Press HARDCOPY anytime to save a copy of the current screen to a unique file in the logic scope file system.

## To Perform Other File System Operations:

- Press **SAVE/RECALL WAVEFORM**, and use the menu buttons to save a waveform to a file or recall it from a file.
- Press **SAVE/RECALL SETUP**, and use the menu buttons to save a setup to a file or recall it from a file.
- Press **File Utilities** in the Save/Recall Waveform, Save/Recall Setup, or Hardcopy menus to access utilities that create directories, copy files, and do other operations in the logic scope file system.

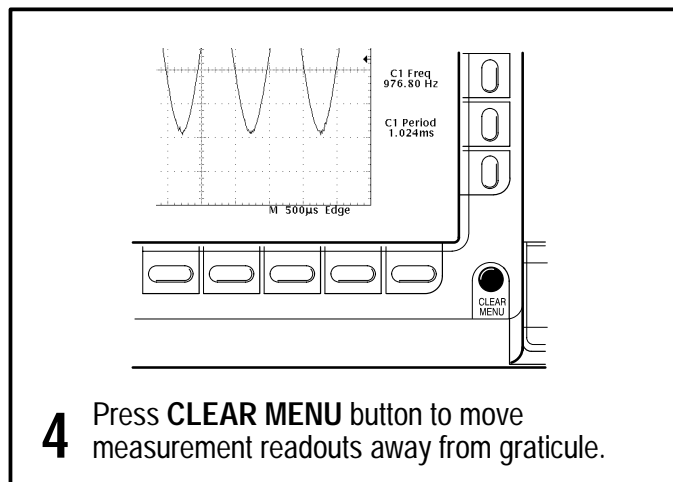
# To Take Measurements Automatically:



### Automated Measurement Selections

Select Measurement	Period	Rise Time	Delay	High	Pk-Pk	Mean	Area	Skew
Frequency	Fall Time	Phase	Low	Amplitude	Cycle Mean	Cycle Area	To 1 of 8	
Positive Width	Positive Duty Cycle	Burst Width	Max	Positive Overshoot	RMS	Setup		
Negative Width	Negative Duty Cycle		Min	Negative Overshoot	Cycle RMS	Hold		
Seq	—more— 1 of 8	—more— 2 of 8	—more— 3 of 8	—more— 4 of 8	—more— 5 of 8	—more— 6 of 8	—more— 7 of 8	

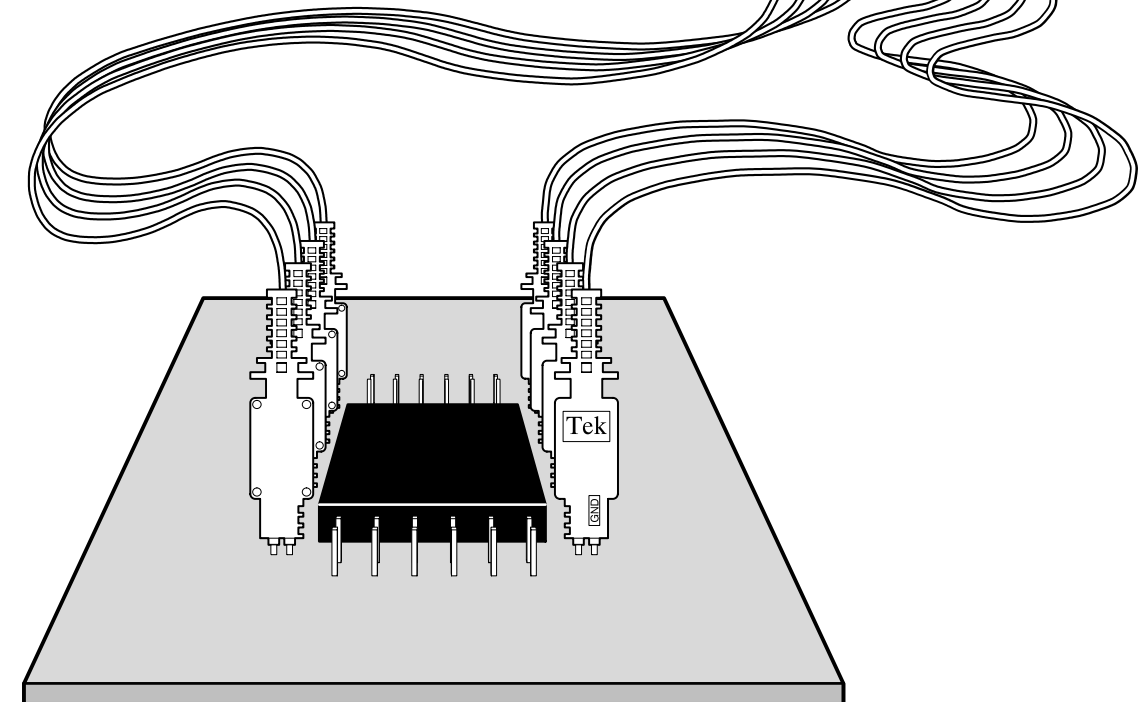
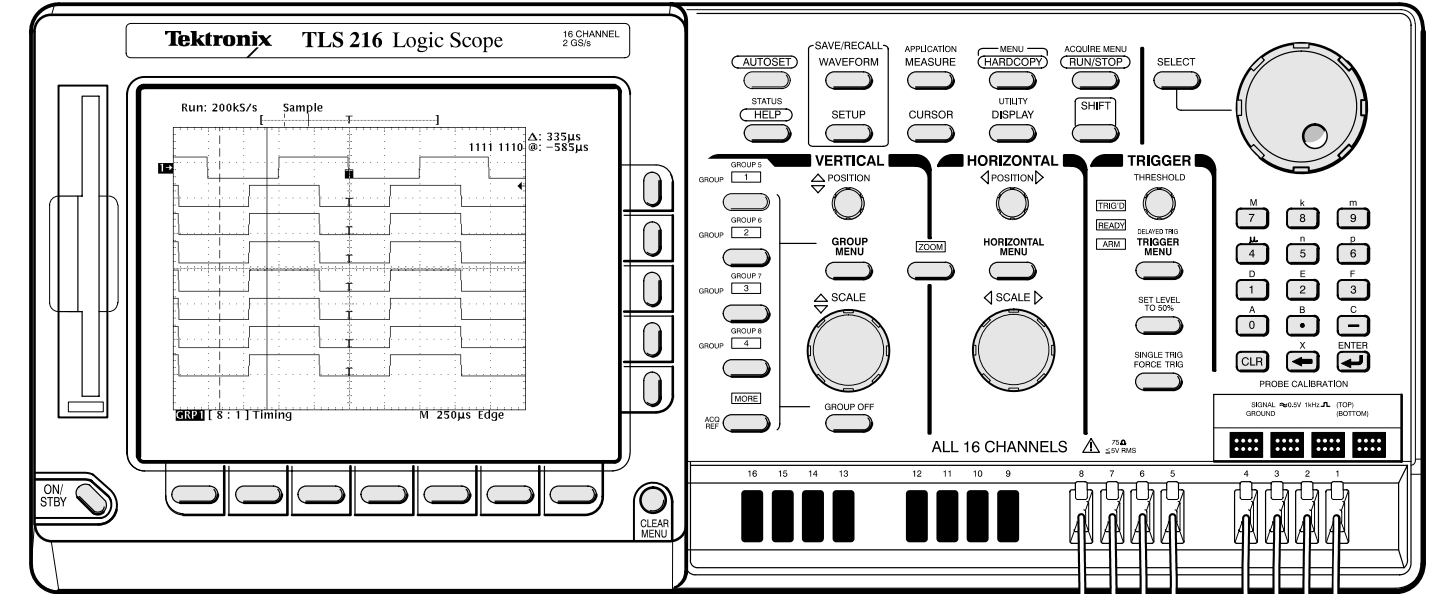
**3** Select up to four measurements.



### To Select a Signal for Measurement:

- Press a Group selection buttons (**GROUP 1**, **GROUP 2**, and so on) to select the group.
- Use the Group menu to access the Group Definition and select the channel.
- Select a measurement. It will be taken on the selected channel in the selected group.

# To Probe Your Digital Circuit:



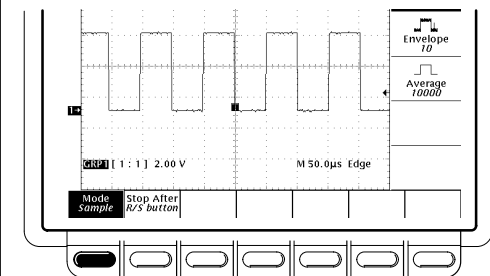
- 1** Attach a probe to each of up to 16 contiguous channel inputs that you want to include in a waveform group (a group of eight is shown).
- 2** Form other groups as needed from any unused contiguous channels using the same process as above.

## To Choose an Acquisition Mode:

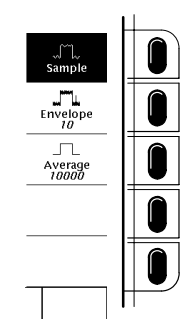
ACQUIRE MENU  
RUN/STOP

SHIFT

**1** Press **SHIFT**, then press **ACQUIRE MENU**.

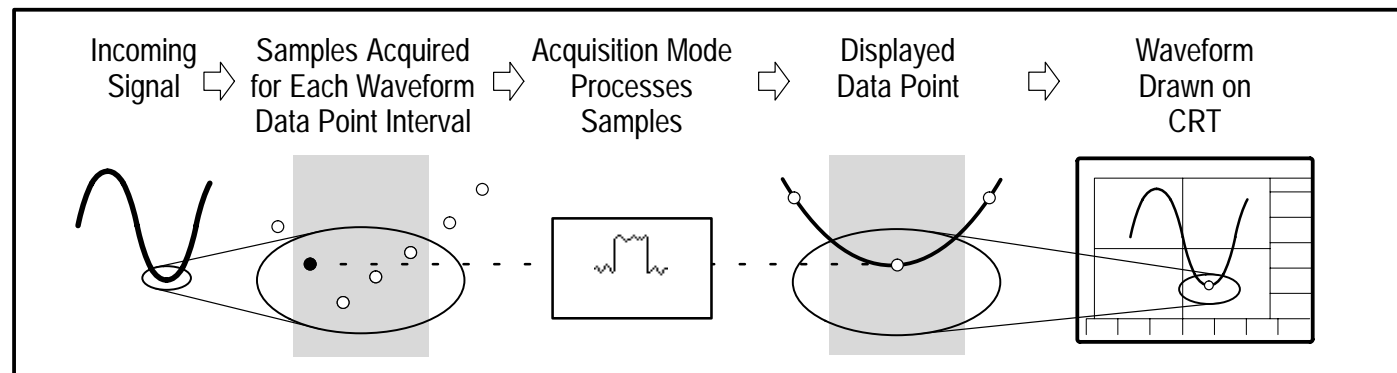


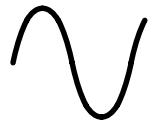
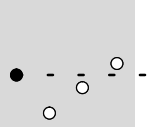
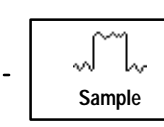
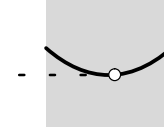

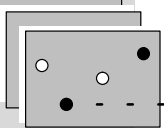

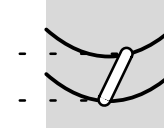

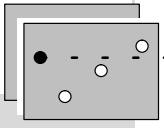
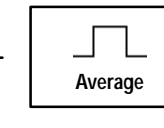
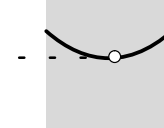
**2** Press **Mode** in main menu.



**3** From side menu, select an acquisition mode that will serve your application.

## How the Acquisition Modes Work:



 Single Waveform Acquisition	 Uses First Sample in Interval	 Sample	 Use for fastest acquisition rate. This is the default mode.
 Multiple Waveform Acquisitions	 Uses the Highest and Lowest Samples over Many Acquisitions	 Envelope	 Use to reveal the noise band around the signal.
 Multiple Waveform Acquisitions	 Calculates Average Value over Many Acquisitions	 Average	 Use to reduce apparent noise in a repetitive signal.

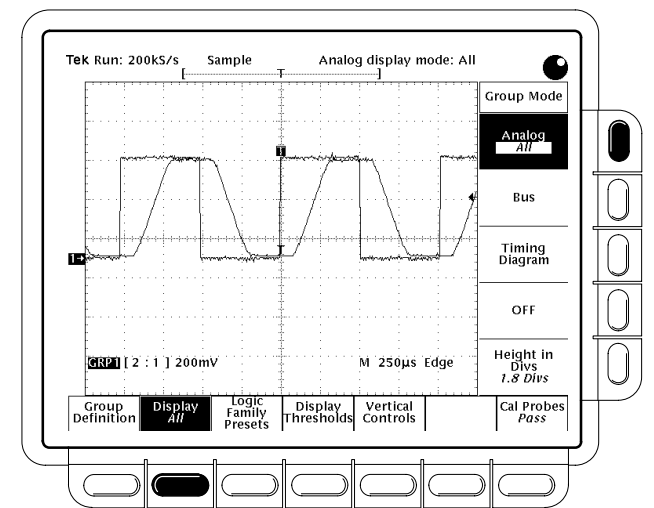
## To Choose a Display Mode:

- 1** Press **GROUP MENU** and select **Display**.
- 2** Press **Analog** to display a group of signals as overlapping waveforms using their actual wavelshape.

Press **Analog** again to toggle between **ALL**, which displays all the signals belong to the group, or **Select**, which displays only the signal selected in the Group Definition menu.

**3**

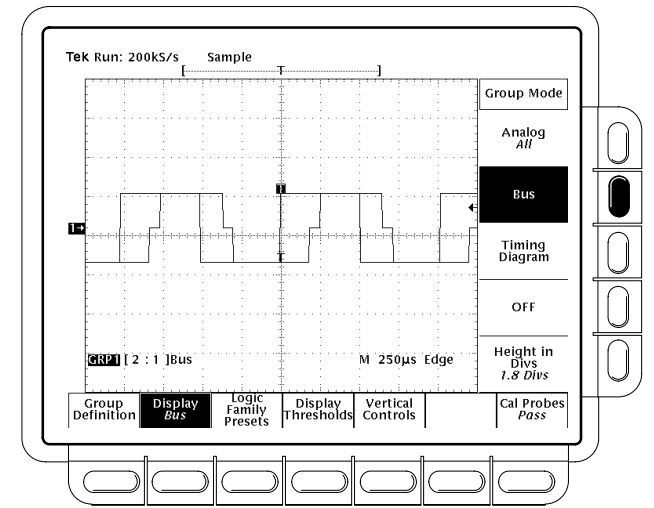
Use Analog mode to display the actual response of your digital waveforms.



- 4** Press **BusForm** to display the group of signals as a single bus of HIGH, LOW, and Median logic values.

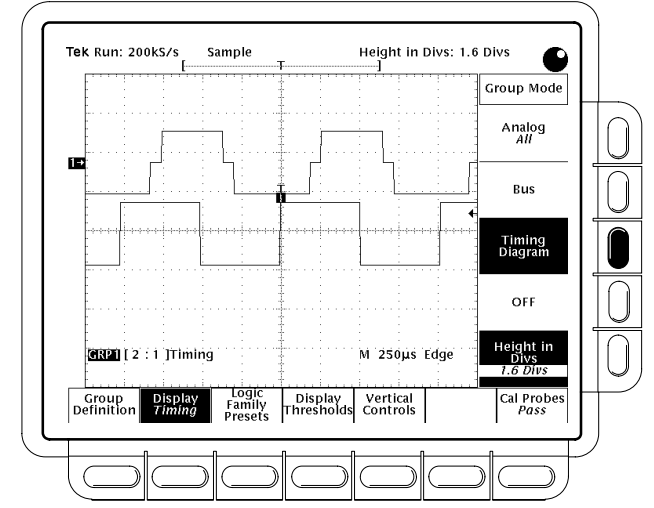
The bus logic levels, or "bus states," show how the input group compares against predefined logic levels.

Use BusForm mode to help you to quickly locate areas of non-ideal digital response.



- 5** Press **Timing Diagram** to display the group of signals as individual waveforms (using logic values).
- 6** Press **Height in Divs** and use the general purpose knob or keypad to set the number of vertical divisions between HIGH and LOW logic levels.

Use Timing Diagram mode to measure time relationships between edges on digital waveforms.



## To Display a Waveform Group:

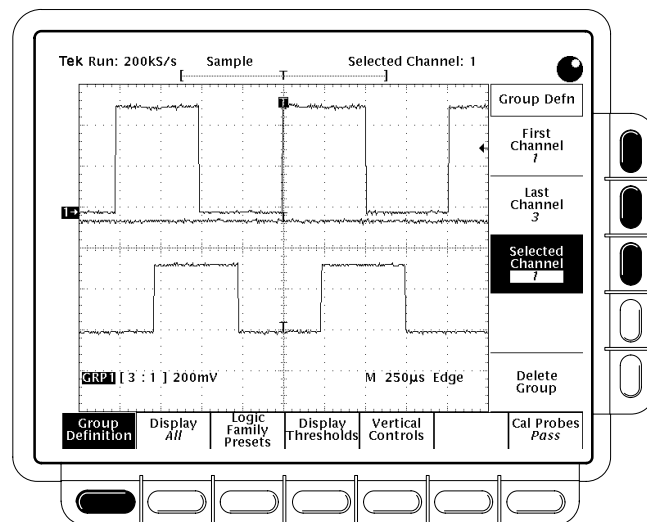
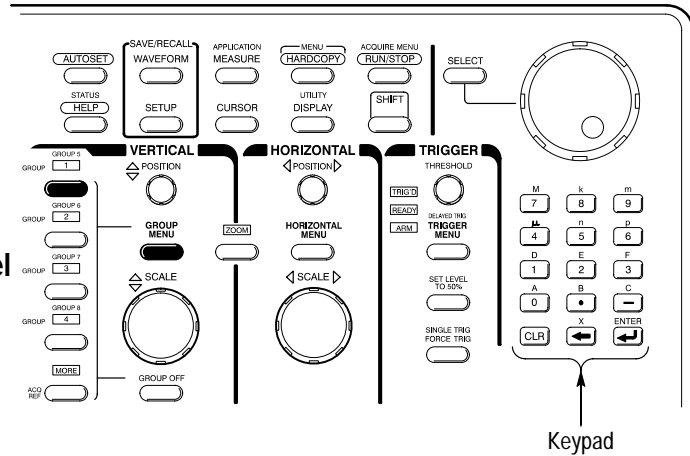
**1** Press **GROUP 1**, and then press **GROUP MENU**.

**2** Press **Group Definition**. Then press **First Channel** and use the keypad to enter the lowest numbered channel in **GROUP 1**.

**3** Press **Last Channel** and use the keypad to enter the highest numbered channel in **GROUP 1** (all channels from first to last must not belong to any other group).

**4** Press **Selected Channel** and use the keypad to choose one of the channels in the group as the selected channel. (The logic scope can display the selected channel alone in Analog mode and is used for taking automated measurements.)

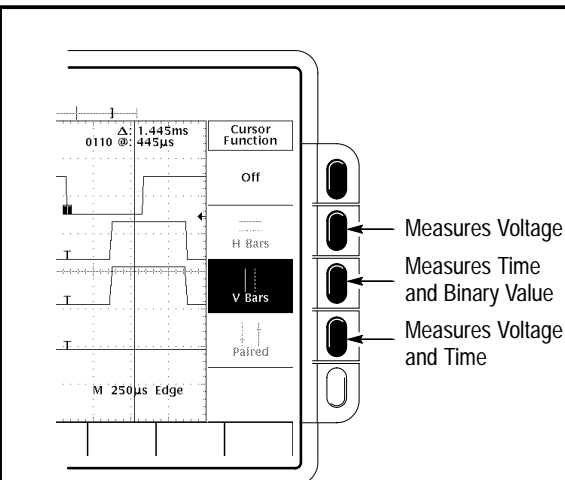
**5** The group readout, **GRP 1 [3 : 1]**, lists the group number and the channels in the group in this format: Group Number [Last Channel : First Channel].



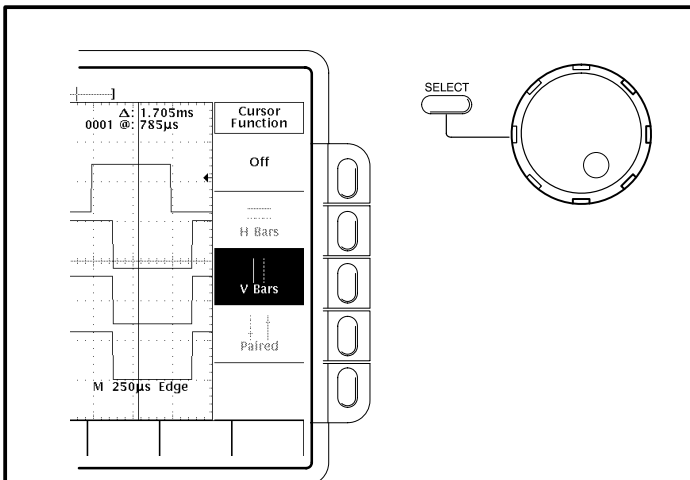
## To Take Measurements With Cursors:

**1** Press **CURSOR** button.

**2** Press **Function** in main menu.



**3** Select from side menu.

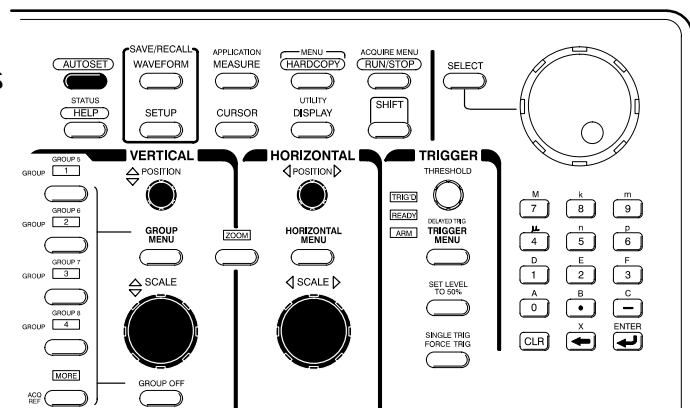


**4** Move cursor with general purpose knob. Press **SELECT** to switch between cursors.

**6** Repeat the above steps to define additional groups as desired. Up to eight groups can be defined.

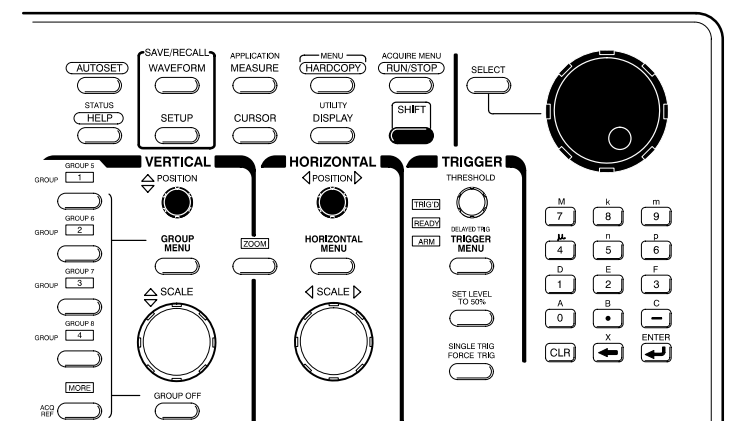
**7** Press **AUTOSET**.

**8** Adjust **VERTICAL POSITION** and **HORIZONTAL POSITION** and **SCALE** as desired.



## To Speed Up Knob Adjustments:

Press the **SHIFT** button to change the rate of the **VERTICAL** and **HORIZONTAL POSITION** and the general purpose knob.



# To Select a Trigger:

**1** Press **TRIGGER MENU** button.

**2** Select trigger type or parameter from main menu.

**3** Set **TRIGGER THRESHOLD**. (Edge or Pulse trigger only.)

"T" Shows Trigger Position

Press to Display Pop-Ups

Press Again to Make Selection

A Pop-Up Selection Changes the Other Main Menu Items

Title of Side Menu

Arrow Shows Trigger Level

Removes Menus From Screen

Trigger Selections									
TYPE <Edge>	TYPE <Pulse>		TYPE <Pattern>	TYPE <State>	TYPE <Sequence>				
	CLASS <Glitch>	CLASS <Width>							
	<b>Trig When</b> < Time > Time Time Out Set Glitch Width	<b>Trig When</b> Within Limits Out of Limits Set Lower and Upper Limits	<b>Limit</b> < Time > Time Time Out Set a Time Limit	<b>Clock</b> Select any one of Ch 1 thru Ch 16 Define polarity and threshold of clock	<b>Trig When</b> < Time > Time Time Out Set a Time Limit				
			<b>Range</b> In Range Out of Range Set Lower and Upper Limits		<b>Range</b> Within Range Out of Range Set Lower and Upper Limits				
<b>Source</b>	Select any one of Ch 1 thru Ch 16 or Aux input	<b>Source</b>	Select any one of Ch 1 thru Ch 16 or Aux input	<b>Source</b>	Select any one of Ch 1 thru Ch 16 or Aux input				
		<b>Define Pattern</b>	Define levels High, Low, or Don't Care for Ch 1 thru Ch 16 and Aux input	<b>Define Pattern</b>	Define levels High, Low, or Don't Care for Ch 1 thru Ch 16 and Aux input				
<b>Slope</b>	Positive Negative	<b>Polarity</b>	Positive Negative	<b>Polarity</b>	Positive Negative				
		<b>Logic</b>	AND OR NAND NOR	<b>Logic</b>	AND OR NAND NOR				
<b>Threshold</b>	Set level or select a preset threshold based on TTL, +ECL, -ECL, or CMOS logic	<b>Threshold</b>	Set level or select a preset threshold based on TTL, +ECL, -ECL, or CMOS logic	<b>Threshold</b>	Set level or select a preset threshold based on TTL, +ECL, -ECL, or CMOS logic				
		<b>Set Thresholds</b>	Set a threshold level for each Ch in pattern	<b>Set Thresholds</b>	Set a threshold level for each Ch in pattern				
		<b>Set Thresholds</b>	Set a threshold level for each Ch in pattern	<b>Set Thresholds</b>	Set a threshold level for each Ch in both the Start and End patterns				