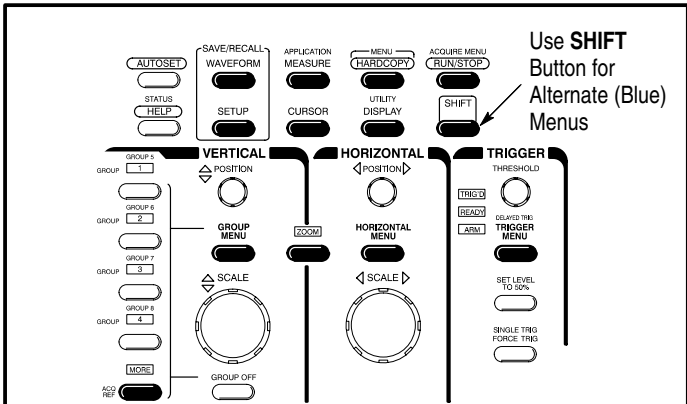


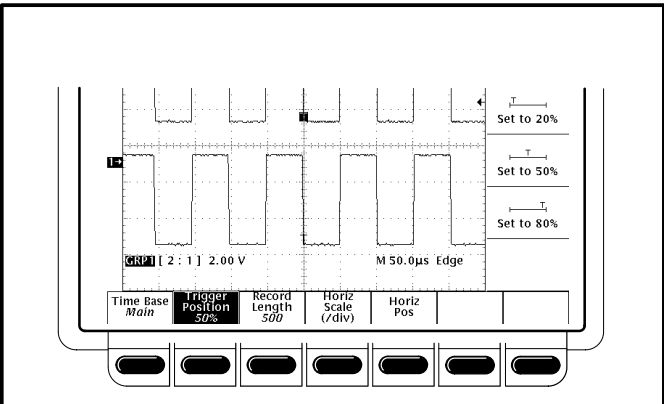
Reference

TLS 216
Logic Scope
070-8833-00

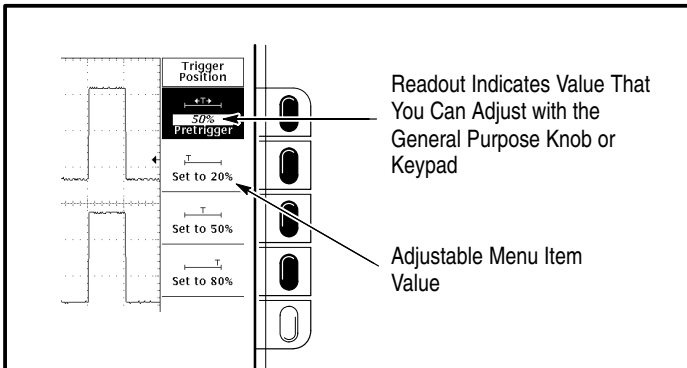
To Set Up Using a Menu:



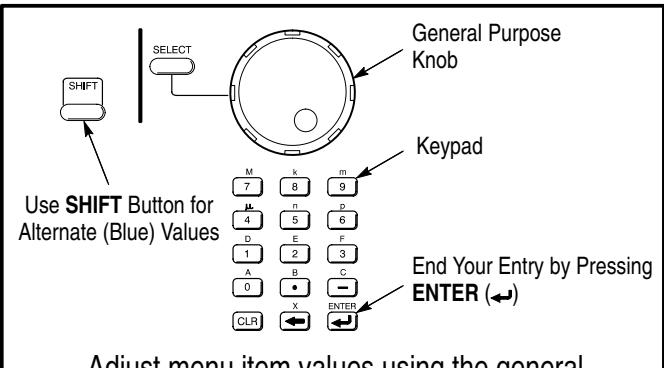
1 Press any of the front panel menu buttons.



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

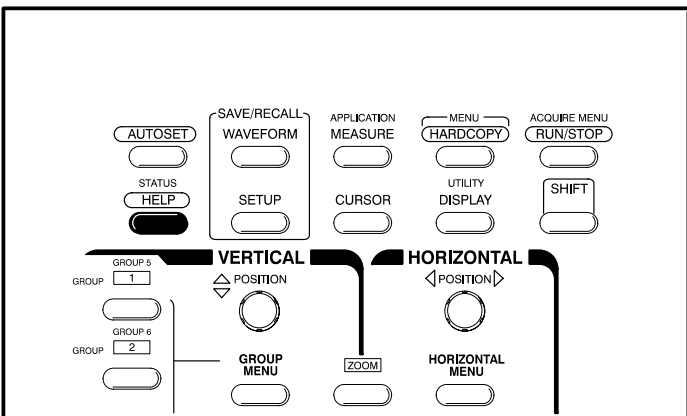


3 Select an item from the side menu, if displayed.

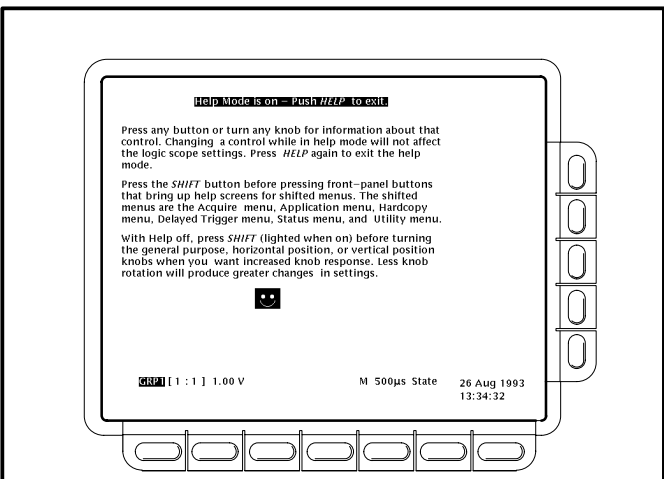


4 Adjust menu item values using the general purpose knob or by entering numbers on the keypad.

To Display Help On Screen:

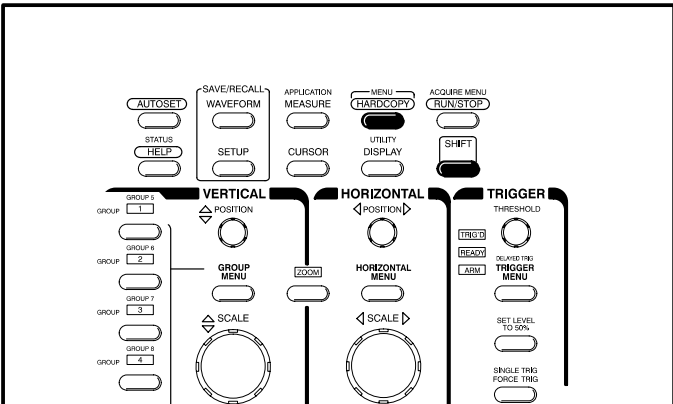


1 Press **HELP** button.

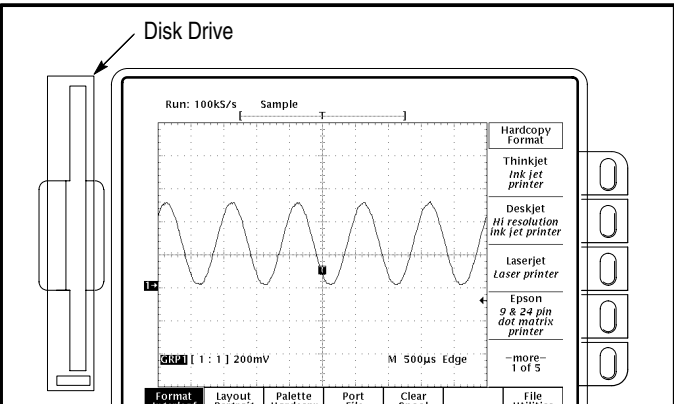


2 Now turn any knob or press any button and read a description of it on the display. Press **HELP** button again to exit help.

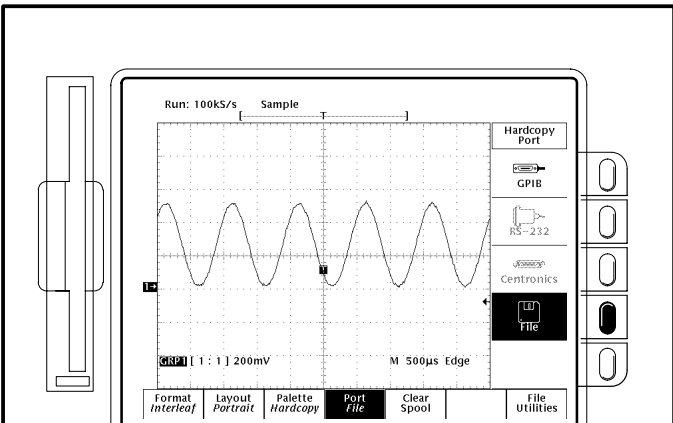
To Save a Hardcopy to the File System:



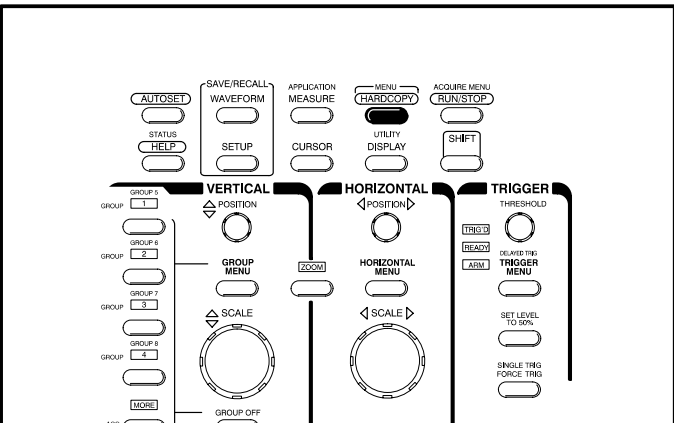
1 Press **SHIFT**, and then press **HARDCOPY**.



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:

AUTOSAVE

STATUS

HELP

SAVE/RECALL WAVEFORM

SETUP

APPLICATION MEASURE

CURSOR

MENU

UTILITY DISPLAY

HARDCOPY

ACQUIRE MENU

RUN/STOP

SHIFT

GROUP 1

GROUP 2

VERTICAL POSITION

GROUP MENU

ZOOM

HORIZONTAL POSITION

HORIZONTAL MENU

1

Press **MEASURE** button.

Frequency

Positive Width

Negative Width

more-1 of 8

GRP1 [1:1] 1.00 V

M 500µs Edge

Select Measrmt for Ch1

Remove Measrmt

Gating Off

High-Low Setup Histogram

Reference Levels

Snapshot

2

Press **Select Measrmt** or **Snapshot** in main menu.

Select Measurement

Period

Frequency

Positive Width

Negative Width

Seq

Snapshot

1

2

3

4

Automated Measurement Selections

Select Measurement

Period	Rise Time	Delay	High	Pk-Pk	Mean	Area	Skew
							To 1 of 8
Frequency	Fall Time	Phase	Low	Amplitude	Cycle Mean	Cycle Area	
Positive Width	Positive Duty Cycle	Burst Width	Max	Positive Overshoot	RMS	Setup	
Negative Width	Negative Duty Cycle		Min	Negative Overshoot	Cycle RMS	Hold	
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.

C1 Freq 976.80 Hz

C1 Period 1.024ms

M 500µs Edge

CLEAR MENU

4

Press **CLEAR MENU** button to move measurement readouts away from graticule.

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:

Tektronix TLS 216 Logic Scope

16 CHANNEL 2 GS/s

Run: 200kS/s Sample

1111 1110

Δ: 335µs @: -585µs

GRP1 [8:1] Timing

M 250µs Edge

ON/STBY

CLEAR MENU

AUTOSAVE

STATUS

HELP

SAVE/RECALL WAVEFORM

SETUP

APPLICATION MEASURE

CURSOR

MENU

UTILITY DISPLAY

HARDCOPY

ACQUIRE MENU

RUN/STOP

SHIFT

SELECT

GROUP 1

GROUP 2

GROUP 3

GROUP 4

GROUP 5

GROUP 6

GROUP 7

GROUP 8

GROUP 9

GROUP 10

GROUP 11

GROUP 12

GROUP 13

GROUP 14

GROUP 15

GROUP 16

VERTICAL POSITION

GROUP MENU

SCALE

GROUP OFF

HORIZONTAL POSITION

HORIZONTAL MENU

SCALE

TRIGGER THRESHOLD

READY

ARM

TRIGGER MENU

SET LEVEL TO 50%

SINGLE TRIG FORCE TRIG

M

k

m

7

8

9

4

5

6

1

2

3

0

.

-

ENTER

CLR

PROBE CALIBRATION

SIGNAL

16.0V

100µA

TOP

GROUND

BOTTOM

ALL 16 CHANNELS

25V

25V

25V

25V

25V

25V

25V

25V

25V

25V

25V

25V

25V

25V

25V

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.

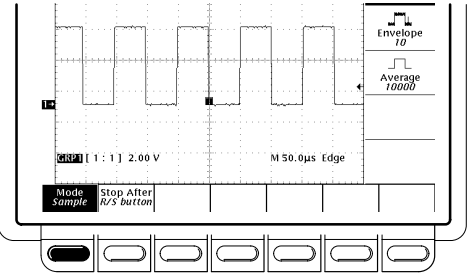
www.valuetronics.com

To Choose an Acquisition Mode:

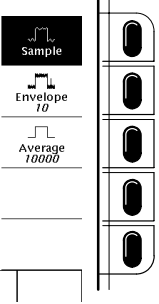
ACQUIRE MENU
RUN/STOP

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:

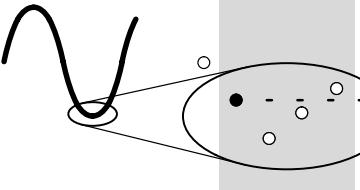
Incoming Signal

Samples Acquired for Each Waveform Data Point Interval

Acquisition Mode Processes Samples

Displayed Data Point

Waveform Drawn on CRT

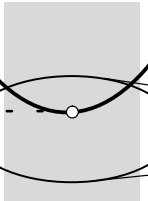


Single Waveform Acquisition



Sample

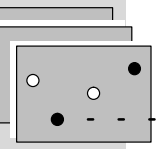
Uses First Sample in Interval



Use for fastest acquisition rate.
This is the default mode.



Multiple Waveform Acquisitions

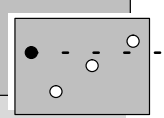


Envelope

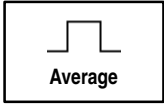
Uses the Highest and Lowest Samples over Many Acquisitions



Use to reveal the noise band around the signal.

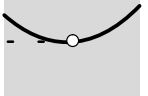


Multiple Waveform Acquisitions



Average

Calculates Average Value over Many Acquisitions



Use to reduce apparent noise in a repetitive signal.

To Choose a Display Mode:

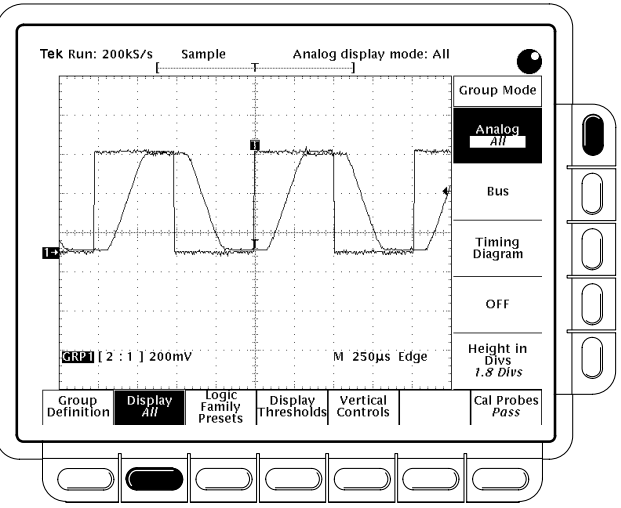
1 Press **GROUP MENU** and select **Display**.

2 Press **Analog** to display a group of signals as overlapping waveforms using their actual wavseshape.

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

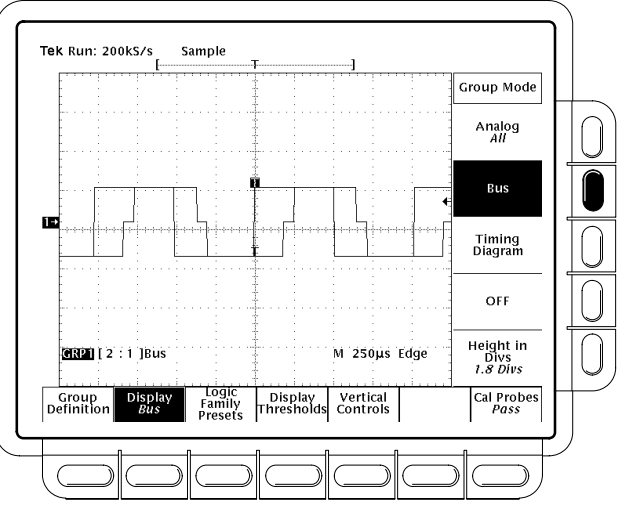
Use Analog mode to display the actual response of your digital waveforms.



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.

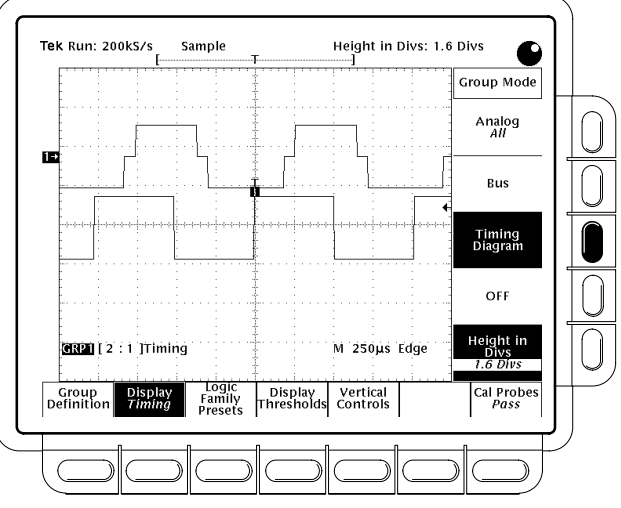
Use BusForm mode to help you to quickly locate areas of non-ideal digital response.



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

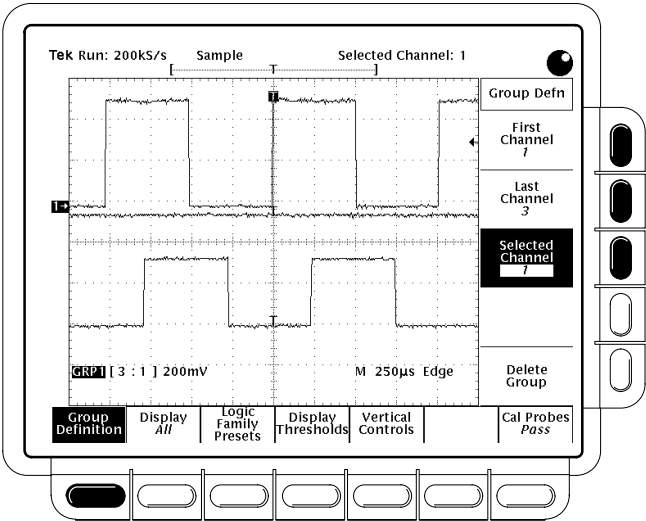
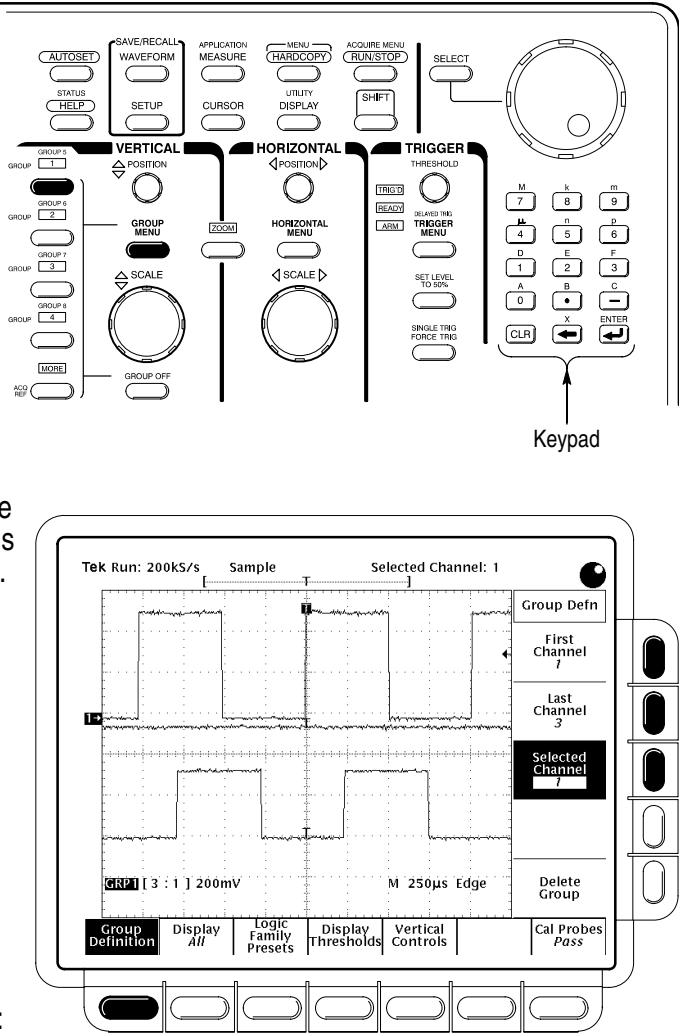
Press **GROUP 1**, and then press **GROUP MENU**.
- 2

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:

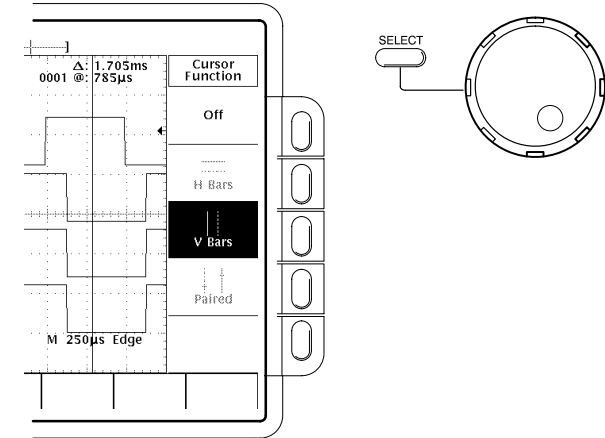
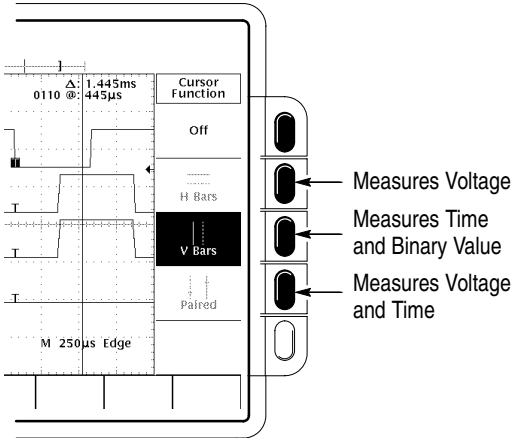
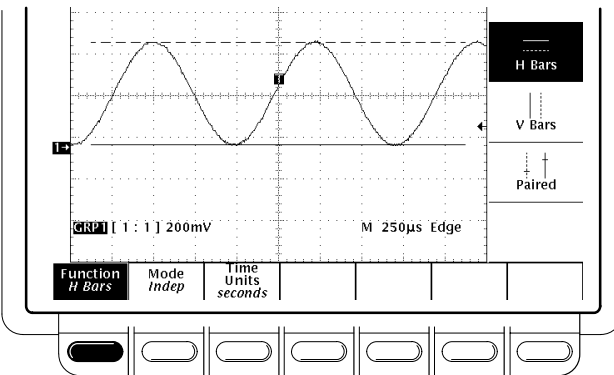
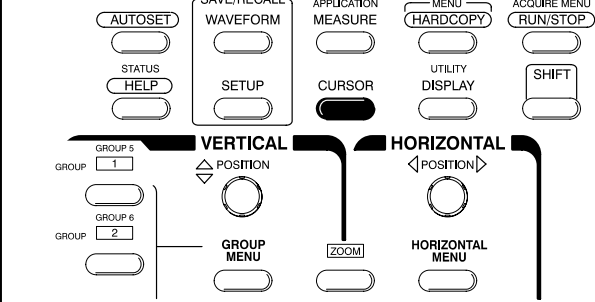
- 1

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.



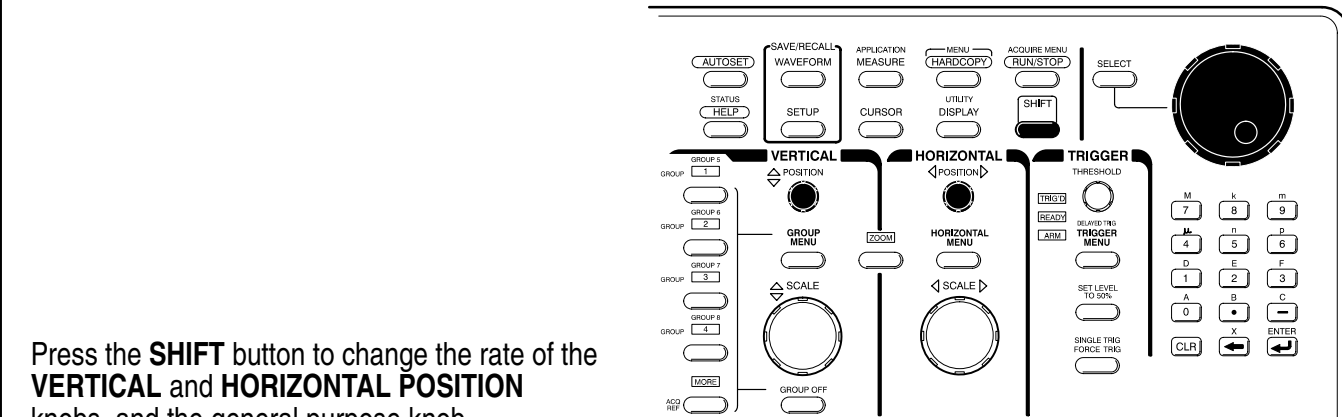
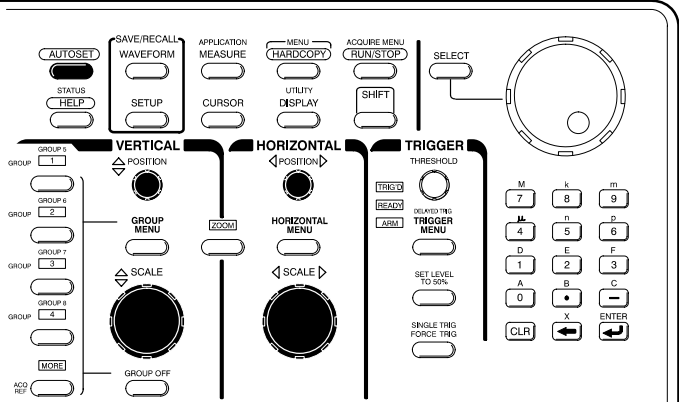
To Speed Up Knob Adjustments:

- 6

Repeat the above steps to define additional groups as desired. Up to eight groups can be defined.
- 7

Press **AUTOSET**.
- 8

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



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

To Select a Trigger:

TRIGGER

THRESHOLD

TRIG'D

READY

ARM

DELATED TRIG

TRIGGER MENU

SET LEVEL TO 50%

SINGLE TRIG

FORCE TRIG

1 Press TRIGGER MENU button.

This Symbol

Indicates Pop-Up Menu

Edge

Pulse

Pattern

State

Sequence

Type

<Edge>

1

200mV

M

500µs

Edge

Source

Ch1

Slope

Threshold

252mV

Mode

& Holdoff

Copy to All

Preset to Logic Family

2 Select trigger type or parameter from main menu.

TRIGGER

THRESHOLD

TRIG'D

READY

ARM

DELATED TRIG

TRIGGER MENU

SET LEVEL TO 50%

SINGLE TRIG

FORCE TRIG

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

Tektronix

TLS 216 Logic Scope

16 CHANNEL

2 GS/s

Tek Run: 100kS/s

Sample

Trigger Threshold: 252mV

Threshold

Copy to Group

Copy to All

Preset to Logic Family

Edge

Pulse

Pattern

State

Sequence

Type

<Edge>

1

200mV

M

500µs

Edge

Source

Ch1

Slope

Threshold

252mV

Mode

& Holdoff

ON/STBY

CLEAR MENU

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