SPECIFICATION

INTRODUCTION

The TEKTRONIX 2445B and 2455B Oscilloscopes are portable 150-MHz and 250-MHz bandwidth instruments having four-channel vertical deflection systems. Channel 1 and Channel 2 provide calibrated deflection factors from 2 mV per division to 5 V per division. For each of these channels, input impedance is selectable between two values: either 1 MΩ in parallel with 15 pF, or 50-Ω internal termination. Input-signal coupling with 1-MΩ impedance can be selected as either AC or DC. Channel 3 and Channel 4 have deflection factors of either 0.1 V or 0.5 V per division. Each of these channels has an input impedance of 1 MΩ in parallel with 15 pF, with DC input-signal coupling.

The trigger system works automatically for most signals. They operate in various modes, from any channel, with couplings for a wide range of signals. The 2445B trigger system gives stable displays from dc to 250 MHz. The 2455B trigger system gives stable displays from dc to 500 MHz.

The horizontal deflection system provides calibrated sweep speeds from 1.5 s per division to 1 ns per division, including the effects of the X10 magnifier and the calibrated variable between the 1-2-5 steps. Horizontal displays include A Sweep, B Sweep (delayed), A alternated with B, and CH 1 (for X/Y displays).

The AUTO, SAVE, and RECALL features save time and prevent errors. Pressing the AUTO Setup button gives a workable setup for almost any signal. For repetitive measurements, the Save and Recall functions record and immediately or sequentially restore as many as 30 instrument setups. The SETUP buttons operate all instrument functions, including the extended function options.

Direct, on-screen readouts of time measurements, voltage measurements, scale factors, trigger levels, and auxiliary information also save time and improve operator confidence.

The instruments are shipped with the following standard accessories:

2 Probe packages
1 Snap-lock accessories pouch
1 Zip-lock accessories pouch
1 Operators manual
1 Power cord (installed)
1 2-A, 250-V fuse
1 Clear plastic CRT filter
1 Blue plastic CRT filter (installed)
1 Front-panel cover
1 Operators pocket reference card

For part numbers and further information about both standard and optional accessories, refer to "Options and Accessories" (Section 7) of the instrument's Operators manual or the Accessories information at the rear of this manual. Your Tektronix representative or local Tektronix Field Office can also provide accessories information and ordering assistance.

PERFORMANCE CONDITIONS

The following electrical characteristics (Tables 1-1 through 1-5) are valid for the instrument when it has been adjusted at an ambient temperature between +20°C and +30°C, has had a warm-up period of at least 20 minutes, and is operating at an ambient temperature between −15°C and +55°C (unless otherwise noted).

Items listed in the "Performance Requirements" column define the measurement capabilities of the instruments. Supplementary measurement conditions may also be listed in the "Performance Requirements" column.

Mechanical characteristics are listed in Table 1-6.

Environmental characteristics are given in Table 1-7. The oscilloscope meets the environmental requirements of MIL-T-28800C for Type III, Class 3, Style C equipment, with the humidity and temperature requirements defined in paragraphs 3.9.2.2, 3.9.2.3, and 3.9.2.4.

Table 1-1
2445B-2455B Electrical Characteristics

Characteristics	Performance Requirements
VERTICAL DEFLECTION SYSTEM—CHANNEL 1 AND CHANNEL 2	
Deflection Factor	
Range	2 mV/division to 5 V/division in a 1-2-5 sequence of 11 steps.
Accuracy	1 MΩ input, noninverted.
+15°C to +35°C	
On-Graticule Accuracy	Within ±2% at any VOLTS/DIV setting for a four or five-division signal centered on the screen.
ΔV Accuracy (using cursors over entire graticule area)	±(1.25% of reading +0.03 div + signal aberrations).
−15°C to +15°C and +35°C to +55°C	Add ±2% of reading.[a]
50 Ω Coupling	Add ±1% of reading.
CH 2 Inverted	Add ±1% of reading.
ΔV Range	±8 X VOLTS/DIV setting.[a]
V/DIV VARiable, noninverted	Continuously variable between VOLTS/DIV settings. Extends deflection factor to >12.5 V/division.
Frequency Response	Bandwidth is measured with a leveled, low distortion, 50-Ω source, sine-wave generator, terminated in 50 Ω. The reference signal amplitude is set at the lesser of 6 divisions or the maximum leveled amplitude. External termination bandwidth is checked with a 4 division reference signal. Bandwidth with probe is checked using a BNC-to-probe-tip (013-0227-00) adapter. Bandwidth with external termination is checked using a BNC 50 Ω feed-through terminator (011-0049-01).
−3 dB Bandwidth	Using standard accessory probe or internal 50-Ω termination.
2455B	
+15°C to +35°C	Dc to 250 MHz.[b]
−15°C to +15°C and +35°C to +55°C	Dc to 200 MHz.[a]
2445B	Dc to 150 MHz.
−4.7 dB Bandwidth	Using 50-Ω external termination on 1-MΩ input.
2455B	
−15°C to +35°C	Dc to 250 MHz.[b]
+35°C to +55°C	Dc to 200 MHz.
2445B	Dc to 150 MHz.

[a]**Performance requirements not checked in manual.**

[b]**If the instrument is subjected to "greater than" 85% relative humidity, bandwidth is reduced by 50 MHz. The instrument then requires more than 50 hours of operation at "less than" 60% relative humidity before full bandwidth is restored.**

Table 1-1 (cont)

Characteristics	Performance Requirements
AC Coupled, Lower −3 dB Frequency	10 Hz or less.
With Standard Accessory Probe	1 Hz or less.[a]
Step Response Rise Time	Calculated from $T_r = 0.35/BW$.[a]
2455B	≤1.4 ns.
2445B	≤2.33 ns.
Channel Isolation	≥100:1 attenuation of deselected channel at 100 MHz; ≥50:1 at 350 MHz, for an eight-division input signal from 5 mV per division to 500 mV per division, with equal VOLTS/DIV settings on both channels.
Displayed Channel 2 Signal Delay with Respect to Channel 1 Signal	Adjustable through a range of at least −500 ps to +500 ps.[a]
Input R and C (1 MΩ)	
Resistance	1 MΩ ±0.5%.[a]
Capacitance	15 pF ±2 pF.[a]
Maximum Input Voltage ⚠	
DC, AC, or GND Coupled	400 V (dc + peak ac). 800 V p-p ac at 10 kHz or less.[a]
Input R (50 Ω)	
Resistance	50 Ω ±1%.[a]
VSWR	≤1:3:1 for dc to Nominal Bandwidth.
Maximum Input Voltage ⚠	5 V rms, averaged for 1 second; ±50 V peak.
Cascaded Operation	Channel 2 Vertical Signal Output into Channel 1 input; DC coupled using a 50 Ω RG-58C/U coaxial cable, with 1 MΩ DC or 1 MΩ AC Channel 1 input coupling; with Channel 1 and Channel 2 VOLTS/DIV set at 2 mV and 20 MHz Bandwidth Limit On.
Deflection Factor	200 μV per division ±10%.
CMRR (ADD Mode with Channel 2 inverted)	At least 20:1 at 50 MHz for common-mode signals of eight divisions or less, with VAR VOLTS/DIV control adjusted for best CMRR at 50 kHz, at any VOLTS/DIV setting.

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
VERTICAL DEFLECTION SYSTEM—CHANNEL 3 AND CHANNEL 4	
Deflection Factors	
Values	100 mV and 500 mV per division.
Accuracy	Within ±10%.
Frequency Response	Bandwidth is measured with a leveled, low distortion, 50-Ω source, sine-wave generator, terminated in 50 Ω. The reference signal amplitude is set at the lesser of 6 divisions or the maximum leveled amplitude. External termination bandwidth is checked with a 4 division reference signal. Bandwidth with probe is checked using a BNC-to-probe-tip (013-0227-00) adapter. Bandwidth with external termination is checked using a BNC 50-Ω feed-through terminator (011-0049-01).
−3 dB Bandwidth	Using standard accessory probe.
2455B	
+15°C to +35°C	Dc to 250 MHz.[b]
−15°C to +15°C and +35°C to +55°C	Dc to 200 MHz.[a]
2445B	Dc to 150 MHz.
−4.7 dB Bandwidth	Using 50-Ω external termination.
2455B	
+15°C to +35°C	Dc to 250 MHz.[a]
−15°C to +15°C and +35°C to +55°C	Dc to 200 MHz
2445B	Dc to 150 MHz.[a]
Step Response Rise Time	Calculated from $T_r = 0.35/BW$.
2455B	≤1.4 ns.
2445B	≤2.33 ns.
Channel Isolation	≥50:1 attenuation of deselected channel at 100 MHz with an 8-division input signal.
Signal Delay Between Channel 1 and Either Channel 3 or Channel 4	Within ±1.0 ns, measured at the 50% points.[a]
Input Resistance	1 MΩ ±1%.[a]
Input Capacitance	15 pF ±3 pF.[a]
Maximum Input Voltage ⚠	400 V (dc + peak ac). 800 V p-p ac at 10 kHz or less.[a]

[a]Performance requirements not checked in manual.

[b]If the instrument is subjected to "greater than" 85% relative humidity, bandwidth is reduced by 50 MHz. After the instrument is subjected to "greater than" 85% relative humidity, it requires more than 50 hours of operation at "less than " 60% relative humidity before full bandwidth is restored.

Table 1-1 (cont)

Characteristics	Performance Requirements
VERTICAL DEFLECTION SYSTEM—ALL CHANNELS	
Low-frequency Linearity	0.1 division or less compression or expansion of a two-division, center-screen signal when positioned anywhere within graticule area.
Bandwidth Limiter	Reduces upper 3 dB bandpass to a limit of 13 MHz to 24 MHz.
Vertical Signal Delay	At least 30 ns of the sweep is displayed before the triggering event is displayed at any SEC/DIV ≥10 ns/div. At 5 ns/div, at least 10 ns of the sweep is displayed before the triggering event.[a]
Chopped Mode Switching Rate	With displayed SEC/DIV in the 20 μs to 2 μs/div range, the switching rate is 2.5 MHz ±0.2%. Otherwise, the switching rate is 1 MHz ±0.2%. The display cycle rate equals the chop switching rate divided by the number of channels displayed. The chop switching rate is modulated slightly to minimize waveform breaks with repetitive signals.[a]
TRIGGERING	
Minimum P-P Signal Amplitude for Stable Triggering from Channel 1 or Channel 2 Source	
2455B	
DC Coupled	0.35 division from dc to 50 MHz; increasing to 1.0 division at 300 MHz and 1.5 divisions at 500 MHz.
NOISE REJ Coupled	≤1.2 divisions from dc to 50 MHz; increasing to 3 divisions at 300 MHz and 4.5 divisions at 500 MHz.
AC Coupled	0.35 division from 60 Hz to 50 MHz; increasing to 1.0 division at 300 MHz and 1.5 divisions at 500 MHz. Attenuates signals below 60 Hz.
HF REJ Coupled	0.5 division from dc to 30 kHz.
LF REJ Coupled	0.5 division from 80 kHz to 50 MHz; increasing to 1.0 division at 300 MHz and 1.5 divisions at 500 MHz.
2445B	
DC Coupled	0.35 division from dc to 50 MHz; increasing to 1.5 divisions at 250 MHz.
NOISE REJ Coupled	≤1.2 divisions from dc to 50 MHz; increasing to 4.5 divisions at 250 MHz.
AC Coupled	0.35 division from 60 Hz to 50 MHz; increasing to 1.5 divisions at 250 MHz. Attenuates signals below 60 Hz.
HF REJ Coupled	0.5 division from dc to 30 kHz.
LF REJ Coupled	0.50 division from 80 kHz to 50 MHz; increasing to 1.5 divisions at 250 MHz.

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
Minimum P-P Signal Amplitude for Stable Triggering from ADD Source	Add 0.5 division to CH 1 or CH 2 requirement at 300 MHz and 500 MHz for 2455B.
Minimum P-P Signal Amplitude for Stable Triggering from CH 3 or CH 4 Source	0.5 X CH 1 or CH 2 requirement.
Minimum P-P Signal Amplitude for Stable Triggering from Composite, Multiple Channel Source, ALT Vertical Mode	Add 1 division to the single-channel source specification. Checked at 50 mV per division.
Maximum P-P Signal Rejected by NOISE REJ COUPLING Signals Within the Vertical Bandwidth	
CH 1 or CH 2 SOURCE	⩾0.4 division for VOLTS/DIV settings of 10 mV/div and higher. Maximum noise amplitude rejected is reduced at 2 mV/div and 5 mV/div.
CH 3 or CH 4 SOURCE	⩾0.2 division.[a]
Jitter	
2455B	⩽50 ps with 5 divisions of 250 MHz at 1 ns/division.
2445B	⩽100 ps with 5 divisions of 150 MHz at 1 ns/division.
LEVEL Control Range	
CH 1 or CH 2 SOURCE	±18 × VOLTS/DIV setting.[a]
CH 3 or CH 4 SOURCE	±9 × VOLTS/DIV setting.[a]
LEVEL Readout Accuracy	For triggering signals with transition times greater than 20 ns.
CH 1 or CH 2 SOURCE	
+15°C to +35°C	Within ±[3% of reading + 3% of p-p signal + 0.2 division + 0.5 mV + (0.5 mV × probe attenuation factor)] with Vertical Input at 1 MΩ DC, CH 2 Source Not Inverted, and Trigger DC Coupled.
−15°C to +35°C and +35°C to +55°C	Add 1.5 mV × probe attenuation to +15°C to +35°C specification.[a]
50 Ω Input	Add ±1% to 1 MΩ input specification.[a]
CH 2 Inverted	Add ±1% of reading to non-inverted specification.[a]
NOISE REJ Coupled	Add ±0.6 division to DC Coupled specifications.[a]
CH 3 or CH 4 SOURCE	Within ±[3% of reading + 4% of p-p signal + 0.1 division + (0.5 mV× probe attenuation factor)] and Trigger DC Coupled.
NOISE REJ Coupled	Add ±0.3 division to the DC Coupled specification.

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
AUTO LVL Mode Maximum Triggering Signal Period	
A SEC/DIV Setting	
<10 ms	At least 20 ms.[a]
10 ms to 50 ms	At least four times the A-SEC/DIV setting.[a]
>50 ms	At least 200 ms.[a]
AUTO Mode Maximum Triggering Signal Period	
A-SEC/DIV Setting	
<10 ms	At least 80 ms.[a]
10 ms to 50 ms	At least 16 times the A-SEC/DIV setting.
>50 ms	At least 800 ms.
AUTO LVL Mode Trigger Acquisition Time	Eight to 100 times the AUTO LVL Mode maximum triggering signal period, depending on the triggering signal period and waveform.
Trigger Holdoff	
Minimum	The greater of the A-SEC/DIV setting value or 2 μs, within +33% to −10%, except 1 μs at 5 ns/div.[a]
Variable	Increases trigger holdoff time to 10 to 25 times the minimum holdoff.
SLOPE Selection	Conforms to trigger-source waveform or ac power-source waveform.
HORIZONTAL DEFLECTION SYSTEM	
A Sweep Time Base Range	500 ms/div to 10 ns/div in a 1-2-5 sequence of 24 steps. X10 MAG extends maximum sweep rate to 1 ns/div.
B Sweep Time Base Range	50 ms/div to 10 ns/div in a 1-2-5 sequence of 21 steps. X10 MAG extends maximum sweep rate to 1 ns/div.
Timing Accuracy	+15°C to +35°C, A Sweep, with SEC/DIV at 100 ms/div or faster.
Sweep Accuracy Unmagnified	±(0.7% of time interval + 0.6% of full scale).
Δt Accuracy With Cursors, Unmagnified	±(0.5% of time interval + 0.3% of full scale).
Δt Accuracy with Sweep Delay	±(0.3% of time interval + 0.1% of full scale + 200 ps).
Delay Accuracy, A-Sweep Trigger to Start of B Sweep	±(0.3% of delay setting + 0.6% of full scale) +0 to −25 ns.
B-Sweep Accuracy and Δt Accuracy with Cursors on B Sweep	Add ±0.3% of time interval to A-Sweep specifications.

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
X10 MAG Accuracy	Add ±0.5% of time interval to unmagnified Sweep and Δt Cursors specifications. Exclude the first 0.5 division after the sweep starts (the first 0.5% of the full 100 division sweep).
500 ms or 200 ms/div Timing Accuracy (A Sweep only)	Add ±0.5% of interval to specifications for A SEC/DIV at 100 ms or faster.
SEC/DIV VAR Timing Accuracy	Add 2% of time interval to sweep accuracy specifications when VAR is out of detent.
Timing Accuracy (−15°C to +15°C and +35°C to +55°C)	Add ±0.2% of time interval to all Δt and delay specifications. Add ±0.5% of interval to sweep accuracy specification.[a]
Δt Readout Resolution	Greater of either 20 ps or 0.25% of full scale.[a]
Δt Range	±10 times A-SEC/DIV setting with Cursors, ±9.95 times A-SEC/DIV setting with Sweep Delay.[a]
Sweep Delay Range	0 to 9.95 times the A SEC/DIV setting, from 500 ms to 20 ns. A-Sweep triggering event is observable on B Sweep with zero delay setting for A SEC/DIV settings 10 μs or faster.[a]
Delay Jitter	Within 0.004% (one part or less in 25,000) of the maximum available delay, plus 50 ps.[a]
Horizontal POSITION Range	Start of 1 ms per division sweep can be positioned from right of graticule center to at least 10 divisions left of graticule center. Some portion of 1 ms per division sweep is always visible with X10 MAG off.[a]
X-Y Operation	
X-Axis Deflection Factor Range, Variable, and Input Characteristics	Same as Channel 1.[a]
Deflection Factor Accuracy	Same as Channel 1.
X-Axis Bandwidth	Dc to 3 MHz.
Phase Difference Between X and Y with BW Limit Off	≤1° from dc to 1 MHz; ≤3° from 1 MHz to 2 MHz.
X-Axis Low-frequency Linearity	0.1 division or less compression or expansion of a two-division, center-screen signal when positioned within the graticule area.

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
DISPLAY	
Cursor Position Range	
Delta Volts (ΔV)	At least the center 7.6 vertical divisions.
Delta Time (Δt)	At least the center 9.6 horizontal divisions.
Graticule	
Size	80 mm X 100 mm.[a]
Markings	8 major divisions vertically and 10 major divisions horizontally, with auxiliary markings.[a]
Trace Rotation Range	Adequate to align trace with the center horizontal graticule line.
Z-AXIS INPUT	
Sensitivity	
Dc to 2 MHz	Positive voltage decreases intensity; +2 V blanks a maximum intensity trace.
2 MHz to 20 MHz	+2 V modulates a normal intensity trace.[a]
Input Resistance	10 kΩ ±10%.[a]
Maximum Input Voltage ⚠	±25 V peak; 25 V p-p ac at 10 kHz or less.[a]
SIGNAL OUTPUTS	
CALIBRATOR	With A SEC/DIV set to 1 ms.
Output Voltage and Current	0.4 V ±1% into a 1-MΩ load, 0.2 V ±1.5% into a 50-Ω load, or 8 mA ±1.5% into a short circuit.[a]
Repetition Period	Two times the A SEC/DIV setting for SEC/DIV from 100 ns to 100 ms.
Accuracy	±0.1% during sweep time.
CH 2 SIGNAL OUT	
Output Voltage	20 mV/division ±10% into 1 MΩ; 10 mV/division ±10% into 50 Ω.
Offset	±20 mV into 1 MΩ when dc balance has been performed within ±5°C of the operating temperature.
A GATE OUT and B GATE OUT	
Output Voltage	2.4 V to 5 V positive-going pulse, starting at 0 V to 400 mV.
Output Drive	Will supply 400 μA during HI state; will sink 2 mA during LO state.[a]

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
AC POWER SOURCE	
Source Voltage	
Nominal Ranges	
115 V	90 V to 132 V.
230 V	180 V to 250 V.
Source Frequency	48 Hz to 440 Hz.[a]
Fuse Rating	2 A, 250 V, AGC/3AG, Fast blow; or 1.6 A, 250 V, 5 X 20 mm Quick-acting.[a]
Maximum Power Consumption (fully optioned instrument)	120 watts (180 VA).[a]
Primary Circuit Dielectric Voltage Withstand Test	1500 V rms, 60 Hz for 10 seconds without breakdown.[a]
Primary Grounding	Type test to 0.1 Ω maximum. Routine test to check grounding continuity between chassis ground and protective earth ground.

[a]Performance requirement not checked in manual.

Table 1-1 (cont)

Characteristics	Performance Requirements
PARAMETRIC MEASUREMENTS	
Period	
Accuracy	
+15°C to +35°C	0.9% + 0.5 ns + Jitter Error. (500PS) (250PS)
-15 to +15°C and +35°C to +55°C	Add 0.3%.
Minimum Period	⩽ 2 ns.
Maximum Period	⩾100 ms (MINFREQ=10Hz).
Minimum Signal Amplitude	⩽ (60 mV + probe attenuation factor p-p). If DC coupling is used, the DC offset voltage must meet the following criteria: at a VOLTS/DIV setting which gives a p-p signal ⩾ 4 divisions, the peak signal + offset must be ,= 12 divisions.
Frequency	Calculated as 1/period.
Volts	
+Peak, −Peak, Peak-to-Peak, and Average	
Accuracy	
+15°C to +35°C	5% of reading + 5 mV + (0.5 mV * probe attenuation) + signal aberrations + 1 Least Significant Digit (LSD).
−15°C to +15°C and +35°C to +55°C	Add (1.5 mV * probe attenuation).
Minimum Width at Peak Amplitude	⩽ 10 ns.
Maximum Sine Wave Frequency	
+15°C to +35°C	⩾ 1 MHz.
−15°C to +15°C and +35°C to +55°C	Add 2%. Volts measurements depend on peak signal measurements. Noise on the input signal, even if at a low repetition rate that makes it difficult to see, will be detected and will affect the measurements.
Pulse Width (High or Low)	
Accuracy	
+15°C to +35°C	0.9% of reading + 1.0 ns + jitter error + 2 * offset error.
−15°C to +15°C and 35°C to +55°C	Add 0.3%.
Minimum Pulse Width	⩽ 5 ns.
Minimum Repetition Rate	⩽ 10 Hz (with MINFREQ = 10 Hz).

Table 1-1 (cont)

Characteristics	Performance Requirements
Duty Cycle	Calculated from Pulse Width and Period.
Rise Time, Fall Time, and Time Interval	
Accuracy	
+15°C to +35°C	5% of reading + 3.0 ns + jitter error + offset error.
Rise/Fall Time	Add 0.5 ns if measurement is made between CH1 and CH2.
Time Interval	0.5 % of reading + 5% of start event transition time + 5% of stop event transition time + 3.0 ns + jitter error + offset error.
	Rise and Fall time measurement is made at 20% and 80% points of transition and linearly extrapolated to the 10% and 90% points.
	Accuracy is relative to time interval as measured on screen using cursors. Measurement is made using peak-to-peak transition for measurement points in percent.
−15 to +15°C and +35°C to +55°C	Add 2%.
Minimum Time	⩽ 5 ns.
Minimum Repetition Rate	⩽ 10 Hz (with MINFREQ = 10 Hz).
Jitter Error	Noise on the input signal causes jitter which introduces errors in the measurements. The amount of jitter depends on the noise amplitude and the slew rate of the input signals.
	The amount of jitter can be calculated as:
	$\text{jitter} = \frac{\text{input noise amplitude (peak)}}{\text{input slew rate in div/sec}}$
	Input slew rate should be measured at 2 Volts/div settings more sensitive than the setting at the end of the measurements or at 5 mV/div, whichever is less sensitive.
	The slew rate must be measured at the same points at which the measurement will be taken. The points for the various measurements are:

	Measurement Points	
Measurement	**First Measurement point**	**Second Measurement point**
Frequency	50% amplitude	50% amplitude
Width	50% amplitude	50% amplitude
Rise, Fall Time	10% amplitude	90% amplitude
Time interval	Specified by Time Interval Configuration	Specified by Time Interval Configuration

Table 1-1 (cont)

Characteristics	Performance Requirements
	The algorithms used for the measurements result in the following equation for the total jitter error that must be applied to the accuracy specifications. Jitter Error = 2 * first point jitter + 2 * second point jitter.
Offset Error	Offset error is introduced when the trigger level is not set exactly at the expected points. This misplacement of the trigger level applied to any non-infinite slew rate produces a timing error. The magnitude of the error is given by: $\text{Offset Error} = \frac{\text{offset}}{\text{input slew rate}}$ Frequency measurements do not suffer from offset errors since measurements are made with the same trigger level and slope, so no offset is introduced. All other timing measurements suffer from offset errors. The slew rates used to calculate offset errors must be measured at the first and second measurement points given in the Measurement Points table. Offset error is calculated as: $\text{Offset Error} = \frac{0.2 \text{ div}}{\text{First Point slew rate}} + \frac{0.2 \text{ div}}{\text{Second Point slew rate}}$ If a time interval measurement is made using Volts mode, the offset at each measurement point is: 0.2 div + 5% of measurement point voltage converted to divisions.