

2465A/2455A/2445A OSCILLOSCOPES and OPTIONS

*Please Check for
CHANGE INFORMATION
at the Rear of This Manual*

Qservice Sample

Contents

	<i>Page</i>
Illustrations	iv
Tables	v
Operators Safety Summary	vi
The 2465A, 2455A, 2445A	ix
1 <i>General Information</i>	
Preparation for Use	1-1
Safety	1-1
Line Voltage Selection	1-1
Line Fuse	1-1
Power Cord	1-3
Instrument Cooling	1-4
Start-up	1-4
Repackaging For Shipment.....	1-5
2 <i>Operation</i>	
Fundamentals.....	2-1
Getting a Display	2-1
Vertical	2-2
Horizontal	2-4
Trigger Controls.....	2-4
Video Triggering.....	2-6
Readout.....	2-8
Measurements with Cursors	2-10
Display Operation	2-12
Signal Connections.....	2-12
Magnify Waveform Details with Delayed-Sweep.....	2-13
B-Trigger Operation.....	2-14
Delta-Delay-Time.....	2-15
Single-Delay-Time Measurements.....	2-16
Precision Timing.....	2-17
Triggered Delta-Delay-Time Measurements	2-18
Time Interval Resolution	2-20
Measurement Updating	2-20
Frequency, Period, and Totalize Counting.....	2-22
Delay Sweeps by Event Counts.....	2-23
Logic Triggering	2-28
Word Recognizer Operation	2-30
The Word Out Signal.....	2-31
DMM	2-31
Save and Recall Operation.....	2-32

3 Applications

Peak-to-Peak Voltage	3-1
Absolute Voltages	3-1
Noise Immunity	3-2
“Quick and Dirty” DC Voltage Measurement.....	3-2
Amplitude Modulation	3-2
Frequency Modulation	3-3
Measuring Video Signals in IRE Units	3-4
Avoiding False Displays with Multi-Mode Signals	3-4
Algebraic Addition to Detect Coincidence or Cancel Interference.....	3-4
Observing Coincidence of Digital Signals	3-5
Measuring Off-Ground Signals And Cancelling Interference	3-5
Period and Frequency	3-6
Rise Time and Fall Time	3-7
Propagation Delay	3-8
Setup and Hold Times	3-8
Slew Rate	3-9
Time Ratio	3-10
Phase Difference Between Two Signals	3-11

4 Checks and Adjustments

Introduction	4-1
Initial Setup	4-1
Trace Rotation and Adjustment	4-1
Astigmatism Adjustment	4-2
Auto DC Balance Routine.....	4-2
Probe Compensation	4-3
Matching Channel 2 Delay	4-4
Amplitude Check	4-5
Timing Check	4-5

5 Controls, Connectors, and Indicators

Introduction	5-1
Power And Display	5-1
Setup and Vertical.....	5-4
Horizontal	5-11
Delay and Delta Controls.....	5-14
Rear Panel.....	5-25
DMM.....	5-27
DMM Displays	5-31
Display-Mode Interactions	5-31

6	<i>Performance Characteristics</i>	
	Performance Conditions	6-1
7	<i>Options and Accessories</i>	
	Introduction	7-1
	Option 11.....	7-1
	Option 1R.....	7-1
	Power Cord Options	7-2
	Standard Accessories.....	7-3
	Optional Accessories	7-4
A	<i>Appendix A</i>	
	Extended Functions with Diagnostic Exercisers	A-1
B	<i>Appendix B</i>	
	Sequence Programming and Operation.....	B-1
	Executing Sequences.....	B-3
C	<i>Appendix C</i>	
	Power Up Tests.....	C-1
	Kernel Test	C-1
	Confidence Tests	C-1
D	<i>Appendix D</i>	
	Delta-Time and Delta-Delay-Time Accuracy under Noted Conditions for the C/T/T Option.....	D-1
	Delay-Time Accuracy under Noted Conditions for the C/T/T Option	D-2

Illustrations

Figure		Page
1-1	Line selector switch, line fuse, and detachable power cord	1-3
2-1	Readout display locations	2-9
3-1	Instantaneous voltages	3-1
3-2	Eliminating common-mode signals	3-6
3-3	Measuring rise times	3-7
3-4	Time between two pulses (cursor method)	3-9
3-5	Time ratio (duty factor)	3-10
3-6	Phase difference between two signals	3-11
3-7	Small-angle phase difference	3-11
4-1	Probe low-frequency compensation	4-3
5-1	Power and display controls	5-3
5-2	SETUP and MODE buttons, and CH 1 and CH 2 POSITION controls	5-5
5-3	Channel 1 and Channel 2 controls and connectors	5-7
5-4	CH 3 and CH 4 controls and connectors and CALIBRATOR output	5-9
5-5	Horizontal and delta measurement controls	5-11
5-6	Trigger controls and indicators	5-18
5-7	Rear panel controls and connectors	5-26
5-8	DMM controls and connectors	5-28
6-1	Dimensional drawing	6-35

Tables

Table		Page
1-1	Power Cord and Voltage Data	1-2
2-1	Resolution Selections.....	2-21
2-2	Auto Resolution.....	2-21
2-3	Delay-by-Events Combinations.....	2-24
2-4	Sweep Triggering	2-29
6-1	2465A/2455A/2445A Electrical Characteristics	6-6
6-2	Option 01 (DMM) Electrical Characteristics	6-15
6-3	Option 05 (TV) Electrical Characteristics.....	6-22
6-4	Option 06 (C/T/T) Electrical Characteristics.....	6-24
6-5	Option 09 (WR) Electrical Characteristics	6-31
6-6	Option 10 (GPIB) Electrical Characteristics.....	6-33
6-7	Mechanical Characteristics	6-34
6-8	Environmental Requirements	6-36
C-1	Confidence Test Numbers and Affected Functions.....	C-2