

SPECIFICATION

Information given in this manual applies to the R7603 Oscilloscope also, unless otherwise indicated. The R7603 is electrically identical to the 7603, but it is adapted for mounting in a standard 19-inch rack. Rackmounting instructions and a dimensional drawing for the R7603 are given in Section 6.

This instrument will meet the following electrical specifications after complete calibration as given in Section 5. The Operating Checkout procedure which is given in Section 1 provides a convenient method of checking instrument performance without making internal checks or adjustments. The following electrical characteristics apply over an ambient temperature range of 0°C to +50°C, except

as otherwise indicated. Warmup time for given accuracy is 20 minutes. Limits and tolerances given in the Supplemental Information column are provided for user information only, and should not be interpreted as Performance Requirements.

NOTE

Many of the measurement capabilities of this instrument are determined by the choice of plug-in units. The following characteristics apply to the 7603 Oscilloscope only. See the System Specification at the end of this section for specifications of the complete system.

VERTICAL DEFLECTION SYSTEM

Characteristic	Performance Requirements	Supplemental Information
Deflection Factor	Compatible with all 7000-series plug-in units.	
Between Compartments	Within 1%.	
Low Frequency Linearity	0.1 division or less compression or expansion of a center-screen 2 division signal when positioned anywhere vertically within the graticule area.	
Bandwidth	See system specifications for 7000-series instruments.	
7603 Vertical Amplifier only (6 div Reference; 0°C to +50°C)	DC to at least 115 MHz.	
Step Response Risettime	See system specifications for 7000-series instruments.	
Isolation Between Vertical Compartments	At least 100:1 from DC to 100 MHz.	
Delay Line		Permits viewing leading edge of trigger signal.
Chopped Mode		
Repetition Rate	1 MHz within 20%.	
Time Segment From Each Compartment	0.4 to 0.6 μ s.	

VERTICAL DEFLECTION SYSTEM (cont)

Characteristic	Performance Requirements	Supplemental Information
Difference In Delay Between Vertical Compartments		0.5 ns or less.
Vertical Display Modes	LEFT: Left vertical unit only. ALT: Dual trace, alternate between vertical units. ADD: Added algebraically. CHOP: Dual trace, chopped between vertical units. RIGHT: Right vertical unit only.	Selected by VERT MODE switch.

TRIGGERING

Characteristic	Performance Requirements	Supplemental Information
Trigger Source	LEFT VERT: From left vertical only. VERT MODE: Determined by vertical mode. RIGHT VERT: From right vertical only.	Selected by TRIGGER SOURCE switch.

HORIZONTAL DEFLECTION SYSTEM

Characteristic	Performance Requirements	Supplemental Information
Fastest Calibrated Sweep Rate	5 ns/div.	
Deflection Factor	Compatible with all 7000-series plug-in units.	
Low Frequency Linearity	0.1 div or less compression or expansion of a center-screen 2 div signal when positioned anywhere horizontally within the graticule area.	
Phase Shift Between the Vertical and Horizontal Amplifiers	Less than 2° from DC to 35 kHz.	
Frequency Response Bandwidth (8 div Reference)	At least 2 MHz.	

CALIBRATOR

Characteristic	Performance Requirements	Supplemental Information
Waveshape	Positive-going squarewave or DC (DC voltage selected by internal jumper).	
Voltage Output Range	40 mV, 0.4 V, and 4 V.	Into 1 M Ω load.
Voltage Output Accuracy		
+15°C to +35°C	Within 1%.	
0°C to +50°C	Within 2%.	
Current Output Accuracy	40 mA.	
+15°C to +35°C	Within 2%.	With optional current loop accessory (012-0259-00) connected between 4 V pin jack and ground pin jack.
0°C to +50°C	Within 3%.	
Repetition Rate		Approximately 1 kHz.
Output Resistance		
40 mV and 0.4 V		Approximately 50 Ω .
4 V		Approximately 450 Ω .

EXTERNAL Z AXIS INPUT

Characteristic	Performance Requirements	Supplemental Information
Sensitivity (Full Intensity Range)	2 V peak to peak.	
Useful Input Voltage Versus Repetition Frequency	2 V peak to peak, DC to 2 MHz; reducing to 0.4 V peak to peak at 10 MHz.	
Polarity of Operation	Positive-going signal decreases intensity.	
Maximum Input Voltage		10 V (DC to peak AC).
Input Resistance		Approximately 500 Ω .

OUTPUTS

Characteristic	Performance Requirements	Supplemental Information
Camera Power (P1041 at CRT Bezel)		
Pin 1 — +15 V		
Pin 3 — single sweep reset		
Pin 5 — ground		

CHARACTER GENERATOR

Characteristic	Performance Requirements	Supplemental Information
Character Size	Adjustable.	
Modes of Operation	Free-run independent of sweep.	Selected by internal READOUT mode switch.
	Triggered after sweep.	

DISPLAY (CRT) and OPTIONS

Characteristic	Performance Requirements			Supplemental Information
Cathode Ray Tube Type	T 7400.			
Graticule				
Type	Internal and illuminated.			
Area	8 X 10 div.			
Standard	1 div equals 1.22 cm.			
Option 4	1 div equals 1 cm.			
Option 6	1 div equals 1.22 cm (Spectrum Analyzer).			
Phosphor				
Standard	P31.			
Option 78	P11 others on request.			
Beam Finder				Limits display to within graticule area when BEAM FINDER switch is actuated.
Photographic Writing Specifications	Phosphor	Standard	Option 4	Polaroid ¹ film type 107 (3000 ASA). Without film fogging techniques.
C53 Camera (f1.9 Lens 1:0.85 Image-to-Object Ratio)	P31	100 div/ μ s	180 cm/ μ s	
	P11	140 div/ μ s	260 cm/ μ s	

¹ Registered trademark Polaroid Corporation.

POWER SOURCE

Characteristic	Performance Requirements	Supplemental Information
Line Voltage Ranges		
110 V nominal	100 V $\pm 10\%$.	
	110 V $\pm 10\%$.	
	120 V $\pm 10\%$.	
220 V nominal	200 V $\pm 10\%$.	
	220 V $\pm 10\%$.	
	240 V $\pm 10\%$.	
Line Frequency		50 to 60 Hz (R7603 and 7603) (7603 B010100 to B368864, 50 to 400 Hz) R7603 and 7603 Option 5, 50 to 400 Hz.
Maximum Power Consumption (115 V AC; 60 Hz)		170 W, 1.9 A.
Fuse Data		
110 V line (F1000)		3.2 A slow blow.
220 V line (F1000)		1.6 A slow blow.
+130 V Supply (F855)		0.15 A fast blow.

SIGNALS OUT

Characteristic	Performance Requirements	Supplemental Information
VERT SIG OUT	See systems specifications for 7000-series instruments.	
Vertical Signals	LEFT, RIGHT, ALT, and ADD.	Selected by TRIG SOURCE switch.
Gain		
Into 50 Ω		25 mV/div.
Into 1 M Ω		0.5 V/div. $\pm 20\%$ system CRT to VERT SIG OUT.
Risetime (Into 50 Ω)		5 ns or less.
Aberrations		
Centering		± 3 div system CRT to VERT SIG OUT. (1.5 V into 1 M Ω or 75 mV into 50 Ω .)
Output Resistance		950 Ω within 2%.
+GATE OUT		
Gate Signals	MAIN, AUXILIARY, and DELAY.	Selected by Gate selector switch.
Output		
Into 50 Ω		0.5 V within 10%.
Into 1 M Ω		10 V within 10%.

SIGNALS OUT (cont)

Characteristic	Performance Requirement	Supplemental Information
Risetime (Into 50 Ω)		20 ns or less
Output Resistance		950 Ω within 2%.
+SAWTOOTH OUT		
Output		
Into 50 Ω		50 mV/unit time ² within 15%.
Into 1 M Ω		1 V/unit time ² within 10%.
Output Resistance		950 Ω within 2%.

ENVIRONMENTAL

Characteristic	Information
<p>NOTE</p> <p><i>This instrument will meet the electrical characteristics given in the Performance Requirement column of the Specifications over the following environmental limits.</i></p>	
Temperature Range	
Operating	0°C to +50°C.
Non-operating	–55°C to +75°C.
Altitude	
Operating	15,000 ft.
Non-operating	Test limit 50,000 ft.
<p>Transportation (packaged instrument, without plug-in units) qualifies under National Safe Transit test procedure 1A, Category II.</p>	

PHYSICAL

Characteristic	Information
Ventilation	Safe operating temperature maintained by convection cooling. (7603) ³ or forced air cooling (R7603). Automatic resetting thermal cutout protects instrument from overheating.

PHYSICAL (cont)

Characteristic	Information
Finish	Anodized aluminum front panel. Painted cabinet.
7603 Overall Dimensions (measured at maximum points)	
Height	11.4 in (28.9 cm).
Width	8.7 in (22.1 cm).
Length	24.0 in (60.9 cm).
Net Weight (instrument only)	30 lb (13.6 kg).
R7603 Overall Dimensions (measured at maximum points)	
Height	5.25 in (13.3 cm).
Width	19.0 in 48.2 cm).
Length	24.7 in (62.9 cm).
Net Weight (instrument only)	30 lb (13.6 kg).

STANDARD ACCESSORIES

Standard accessories supplied with the 7603 are given in the Mechanical Parts List illustrations. For optional accessories available for use with this instrument, see the Tektronix, Inc. catalog.

²Referenced to Time/Div setting.

³See Line Frequency specification.