OPERATOR'S SPECIFICATIONS

Refer to the service manual for complete specifications. Specifications given are for an operating range of 0°C to +40°C unless otherwise stated.

475 OSCILLOSCOPE

VERTICAL

Deflection Factor Accuracy: Within 3% in the calibrated position.

Frequency Response: Dc to at least 200 MHz for CH 1 and CH 2. Ac-coupled, low-frequency response is 10 Hz or less. Use of a 10X probe extends frequency response to 1 Hz.

Risetime: 1.75 nanoseconds or less (calculated from 0.35 ÷ bandwidth in MHz).

Maximum Input Voltage: Dc-coupled 250 V (dc + peak ac) or 500 V p-p ac at 1 kHz or less; ac-coupled, 500 V (dc + peak ac) or 500 V p-p ac 1 kHz or less.

Positive-Going Step Aberrations: Less than +3%, −3%, not to exceed 3% peak-to-peak, excluding the ADD mode.

Common-Mode Rejection Ratio (ADD Mode with CH 2 Inverted): At least 10:1 at 20 MHz for common mode signals of 6 divisions or less with GAIN adjusted for best CMRR at 50 kHz.

Input Gate Current: 0.5 nA or less (0.1 div at 5 mV/DIV), from −15°C to +30°C.

Channel Isolation: At least 100:1 at 25 MHz.

CHOP Mode Repetition Rate: Approximately 250 kHz.

Cascaded Operation (CH 2 OUT into CH 1) sensitivity: Approximately 400 mV/DIV. Bandwidth is dc to at least

50 MHz, with CH 2 OUT connected to CH 1 input. AC-coupled, using a 50 Ω, 42-inch BNC cable, terminated in 50 Ω at CH 2 Input.

TRIGGERING

Sensitivity

Ac Coupled Signal: 0.3 div internal or 50 mV external, from 60 Hz to 25 MHz; increasing to 1.5 div, internal or 150 mV external at 100 MHz.

LF REJ Coupled Signal: 0.5 div internal or 100 mV external, from 50 kHz to 25 MHz; increasing to 1.5 div internal or 300 mV external at 100 MHz. Attenuates signals below about 50 kHz.

HF REJ Coupled Signal: 0.5 div internal or 50 mV external, from 60 Hz to 50 kHz. Attenuates signals below about 50 Hz and above about 50 kHz.

DC Coupled Signal: 0.3 div internal or 50 mV external, from dc to 25 MHz; increasing to 1.5 div internal or 150 mV external at 100 MHz.

EXT ÷ 10 Signal: Amplitude requirements are multiplied by 10.

External Trigger Input

Maximum Input Voltage: 250 V (dc + peak ac) or 250 V p-p ac (1 kHz or less).

Level Control Range in Ext

At least + and −2 V, 4 V p-p; EXT ÷ 10 is at least + and −20 V, 40 V p-p.

Trigger View

Deflection Factor: About 50 mV/div in EXT and about 500 mV/div in EXT ÷ 10.

Risetime: 5 ns or less.

Trigger Centering Point: Within 1.0 division of screen center.

DIFFERENTIAL TIME MEASUREMENT (BASIC 475)

Accuracy for Measurements Greater than One Major Dial Division: Within ±1% from +15° C to +35° C. Within +1.5% from −15° C to +55° C.

Accuracy for Measurements Less than One Major Dial Division: Within ±0.01 major dial divisions from +15° C to +35° C. Within ±0.02 major dial divisions from −15° C to +55° C.

DIFFERENTIAL TIME MEASUREMENT (DM44)

Refer to TIME AND 1/TIME under DM44 DIGITAL MULTIMETER.

HORIZONTAL

Sweep Rate Accuracy: Within 2%, unmagnified, and 3% magnified, from +20° C to +30° C for A and B Sweeps.

Mixed Sweep Accuracy: Within 2% plus the measured A Sweep inaccuracy, when viewing the A portion only. B Sweep portion remains the same as above.

Trigger Holdoff Variable: Increases A Sweep holdoff time by at least a factor of 10.

Delay Time Jitter: 1 part, or less, in 50,000 (0.002%) of 10 times the A TIME/DIV switch setting.

Calibrated Delay Time (VAR control to CAL): Continuous from 0.2 μs to at least 5 seconds after the start of A (delaying) sweep.

X-Y

X-Axis Sensitivity (X10 MAG turned off): Same as the vertical system.

X-Axis Bandwidth: Dc to at least 4 MHz, with a 10 division reference signal.

Phase Difference Between X- and Y-Axis Amplifiers: Within 3° from dc to 50 kHz.

Deflection Accuracy: Within 4%.

CALIBRATOR

Output Voltage: 0.3 V within 1% and within 0.3% from +20° C to +30° C.

Output Current: 30 mA within 2% from +20° C to +30° C.

Repetition Rate: About 1 kHz.

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Z AXIS INPUT

Sensitivity: Noticeable intensity modulation, at normal intensity settings, by a 5 V p-p signal. A positive-going signal decreases intensity.

Frequency Range (Usable): Dc to 50 MHz.

Maximum Input Voltage: 100 V (dc plus peak ac) or 100 V p-p ac at 1 kHz or less.

OUTPUTS

CH 2 Out

Output Voltage: At least 50 mV/div into 1 MΩ; to at least 25 mV/div into 50 ohms.

Bandwidth: Dc to at least 50 MHz into 50 ohms.

DC Level: About 0 volts.

A+ and B+ Gates

Output Voltage: About 5.5 V of positive-going pulse.

Output Resistance: About 500 ohms.

AC POWER SOURCE

Regulating Ranges:

	115 V	230 V
Low	99 V to 121 V	198 V to 242 V
Medium	104 V to 126 V	207 V to 253 V
High	108 V to 132 V	216 V to 264 V

Line Frequency: From 48 Hz to 440 Hz.

Maximum Power Consumption: 100 watts at 115 V, 60 Hz, medium range.

ENVIRONMENTAL

Operating Temperature: −15°C to +55°C.

Operating Altitude: To 15,000 feet. Maximum operating temperature decreases 1°C/1,000 feet, above 5,000 feet.

Humidity (Operating and Storage): 5 cycles (120 hours) referenced to MIL-E-16400F.

DM44 DIGITAL MULTIMETER

RESISTANCE

Maximum Safe Input Voltage: 120 V rms between + and COM inputs.

Resistance Accuracy: 200 Ω range—within 0.25% ±1 count, plus probe resistance; 2 kΩ, 20 kΩ, 200 kΩ, and 2 MΩ ranges—within 0.25% ±1 count; 20 MΩ range—within 0.3% ±1 count.

Temperature Dependence: 20 kΩ, 200 kΩ and 2 MΩ ranges—250 ppm/°C; 200 Ω, 2 kΩ and 20 MΩ ranges—350 ppm/°C.

Resolution: 0.1 Ω.

Recycle Time: At least 3 measurements/second.

Response Time: All ranges within 1 second except 2 MΩ and 20 MΩ (within 5 seconds).

TIME

Accuracy: +15 to +35°C; within 1% of reading ±1 count. −15 to +55°C; within 1.5% of reading ±1 count.

1/TIME

Accuracy: +15 to +35°C; within 2% of reading ±1 count. −15 to +55°C; within 3% of reading ±1 count.

TEMPERATURE

Range: −55°C to +150°C in 1 range.

Accuracy: Original Probe—Within 2°C, −55°C to +125°C. Within 3°C, +125°C to +150°C.

Replacement Probe: Accuracy will equal original probe accuracy after DM44 is compensated.

Maximum Safe Voltage on Measurement Surfaces: ±100 V (dc + peak ac) above chassis ground.

Temperature (Storage and Operating): Probe Body and Cable, −55°C to +105°C. Probe Sensor Tip, −55°C to +150°C.

DC VOLTAGE

Maximum Safe Input Voltage: ±1200 V (dc + peak ac) between + and chassis.

Common Floating Voltage: ±500 V (dc + peak ac) to chassis.

DC Voltage Accuracy: Within 0.1% of reading, ±1 count.

Temperature Dependence: 44 ppm/°C.

Resolution: 100 μV.

Recycle Time: At least 3 measurements/second.

Response Time: Within 0.5 second.

Normal/Common Mode Rejection Ratio:

Normal Mode—At least 60 dB at 50 Hz and 60 Hz.

Common Mode—At least 100 dB at dc; 80 dB at 50 Hz and 60 Hz.

Input Impedance: 10 MΩ.