

## 576

Tests Two- and Three-Terminal Discrete Semiconductors

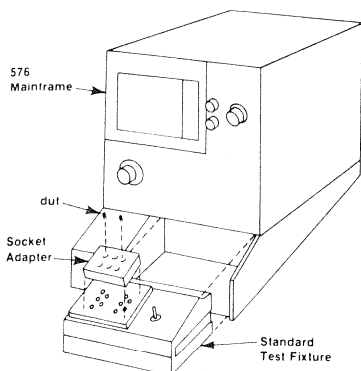
Power Capability Up to 220 Watts

Convenient Scale Factor Readout

Other Test Fixtures for Semiautomated Testing and Testing Power Devices to 1000 Watts

### TYPICAL APPLICATIONS

Semiconductor R & D  
Production Device Testing  
Incoming Inspection



The Tektronix 576 Curve Tracer System continues to hold the title "standard of the industry." The 576 accepts three different test fixtures: the Standard Test Fixture, 172 Programmable Test Fixture (see page 383), and the 176 Pulsed High Current Fixture (see page 384). The 576 is an excellent general purpose curve tracer system that performs well in applications where high current testing is required.

With the Standard Test Fixture, the collector supply of the 576 delivers up to 220 watts peak to the device under test. The step generator can deliver up to two amps in both its current and voltage modes of operation. With the 176 High Current Fixture, the 576 is capable of pulsed collector operation up to 200 amps peak.

One of the features that sets the 576 apart from the Tektronix 577 Curve Tracer System is the display area adjacent to the 576's CRT. These alphanumeric indicators provide readout of vertical and horizontal deflection factors, step amplitude, and Beta/div or  $g_m$ /div. The Beta or  $g_m$  readout saves the operator from the arithmetic usually necessary to arrive at these parameters. These indicators also provide a permanent record of major knob settings in 576 CRT photographs.

Another unique feature of the 576 is the Calibrated Display Offset. Combining a calibrated position control and a display magnifier, the Display Offset increases resolution and allows the operator to make more precise measurements.

Other features of the 576 Curve Tracer include: adjustable current limiting in the step generator; either 300  $\mu$ s or 80  $\mu$ s pulse width in pulsed base operation; push-buttons to check display zero and calibration; and an illuminated graticule.

A safety interlock protects the operator from dangerous voltages. For collector voltages greater than 15 V, a plastic protective safety shield must be in place over the test terminals and its lid closed before collector voltage can be applied.



Standard Test Fixture.

## CHARACTERISTICS COLLECTOR SUPPLY

**Modes/Polarity** — Norm: Ac (at line frequency); positive or negative full-wave rectified ac. Dc: Positive or negative dc. Leakage: Emitter current rather than collector current measurements. 1000X increase in vertical deflection sensitivity (1 nA/div).

### Voltagess\*1

Range	15 V	75 V	350 V	1500 V
Max Continuous Peak Current	10 A	2 A	0.5 A	0.1 A
Peak Pulse Current	≥20 A	≥4 A	≥1 A	≥0.2 A

\*1 Peak open circuit voltages within +35% and -5% of indicated range.

**Series Resistance** — From 0.3 Ω to 6.5 MΩ in 12 steps, all within 5% or 0.1 Ω. Peak Power Limit Setting: 0.1 W, 0.5 W, 2.2 W, 10 W, 50 W, 220 W.

**Safety Interlock** — Protects operator from dangerous voltages.

### STEP GENERATOR

**Current Mode** — Step/Offset Amplitude Range: 5 nA/step (with X0.1 Mult) to 200 mA/step, 1-2-5 sequence. Maximum Current (Steps and Aiding Offset): X20 amplitude setting, except X10 (2 A) at 200 mA/step and X15 (1.5 A) at 100 mA/step. Maximum Voltage (Steps and Aiding Offset): At least 10 V. Maximum Opposing Offset Current: X10 amplitude setting or 10 mA, whichever is less. Maximum opposing voltage is limited at 1 V to 3 V.

**Voltage Mode** — Step/Offset Amplitude Range: 5 mV/step (with X0.1 Mult) to 2 V/step, 1-2-5 sequence. Maximum Voltage (Steps and Aiding Offset): X20 amplitude switch setting, 40 V maximum. Maximum Current (Steps and Aiding Offset): At least 2 A at 10 V, derating to 10 mA at 40 V. Short Circuit Current Limiting: 20 mA, 100 mA, 500 mA +100%, -0%; 2 A +50%, -0%. Maximum Opposing Offset Voltage: X10 amplitude setting. Maximum Opposing Current: Limited between 5 mA and 20 mA.

**Accuracy** — Incremental: Within 5%, between steps, within 10% with X1.0 Mult. Absolute: Within 2% of total output including offset, or 1% of amplitude setting, whichever is greater. Offset Multiplier: Continuously variable from 0 to X10 the amplitude setting, either aiding or opposing the step polarity.

**Step Rates** — Selectable at X1, X2 or X4 line frequency.

**Pulsed Steps** — ≈80 μs or 300 μs width.

**Step/Offset Polarity** — Same as Collector Supply polarity and positive in ac position. Polarity can be independently inverted with Step/Offset Polarity control or from the test fixture.

**Step Family** — Repetitive or single family.

**Number of Steps** — Selectable from 1 to 10.

**Vertical Deflection Factor** — Collector Current: 1 μA/div to 2 A/div, 20 steps in 1-2-5 sequence (0.1 μA/div with X10 magnification). Emitter Current: 1 nA/div to 2 mA/div, 20 steps in 1-2-5 sequence. Step Generator: 1 step/div.

**Horizontal Deflection Factor** — Collector Volts: 50 mV/div to 200 V/div, 12 steps (5 mV/div with X10 magnification). Base Volts: 50 mV/div to 2 V/div, 6 steps (5 mV/div with X10 magnification). Step Generator: 1 step/div.

## DEFLECTION CONTROLS

### Display Accuracies\*1

Display Modes	Normal and Dc Modes	Offset and Magnified With Centerline Value From:		
		100-40 div	35-15 div	10-0 div
Vertical Collector Current	3%	2%	3%	4%
Horizontal Collector Volts	3%	2%	3%	4%
Horizontal Base Volts	3%	2%	3%	4%
<b>Leakage Mode</b>				
Vertical Emitter Current				
10 nA/div to 2 mA/div	3% ± 1 nA	Not Applicable		
1 nA/div to 200 μA/div	—	2% ± 1 nA	3% ± 1 nA	4% ± 1 nA
5 nA/div, 2 nA/div, 1 nA/div	5% ± 1 nA	Not Applicable		
Horizontal Collector Base Volts with Emitter Current of:				
≥1 μA/div	3%	2%	3%	4%
100 nA/div, 10 nA/div, 1 nA/div	3% + 25 mV/Vert div	Not Applicable		
200 nA/div, 20 nA/div, 2 nA/div	3% + 50 mV/Vert div	Not Applicable		
500 nA/div, 50 nA/div, 5 nA/div	3% + 125 mV/Vert div	Not Applicable		
<b>Step Generator Mode</b>				
Vertical	4%	3%	4%	5%
Horizontal	4%	3%	4%	5%

\*1 As a percentage of highest on-screen value.

### Displayed Noise\*1

Range	15 V	75 V	350 V	1500 V
Vertical Collector	1 μA	1 μA	2 μA	5 μA
Vertical Emitter	1 nA	1 nA	1 nA	5 nA
Horizontal Base	5 mV	5 mV	5 mV	5 mV
Horizontal Collector	5 mV	5 mV	20 mV	200 mV

\*1 1% or less, or the values shown.

**Position Controls** — Fixed 5 div increments within 0.1 div. Continuous fine control over 5 div or less.

**Display Offset** — 21 calibrated positioning increments, vertically or horizontally, of 0.5 div or 5 div with X10 Magnifier.

### CRT

**CRT** — 165 mm (6.5 in) rectangular with 10 cm x 10 cm division (12 cm usable horizontal) parallax-free, illuminated graticule, GH (P31) phosphor standard. Accelerating potential is 4.0 kV.

**Readout** — The readouts, adjacent to CRT, are digital indicators of the following parameters: Per Vert Div from 1 nA/div to 2 A/div; per Horiz Div from 5 mV/div to 200 V/div; Per Step from 5 nA/step to 2 A/step, 5 mV/step to 2 V/step; β (Beta) or 9m, per Div from 1 μ to 500 k calculated from Current/Div, X10 Mag, Step Amplitude, and X0.1 Mult.

## POWER REQUIREMENTS

**Voltage Ranges** — 90 V ac to 136 V ac or 180 V ac to 272 V ac (six positions).

**Line Frequency** — 48 Hz to 66 Hz.

**Maximum Power Consumption (Including DUT Power)** — 305 W. Standby Power: ≈60 W.

## ENVIRONMENTAL AND SAFETY

**Ambient Temperature** — Operating: +10°C to +40°C. Nonoperating: -40°C to +65°C.

**Altitude** — Operating: To 3000 m (10,000 ft). Nonoperating: 15 000 m (50,000 ft).

**Vibration** — Operating: 15 minutes along each of the three major axes. 0.04 cm (0.015 in) p-p displacement 10 Hz to 50 Hz to 10 Hz in one minute cycles. Held for three minutes at 50 Hz.

**Shock** — Nonoperating: 30 g's, 1/2 sine, 11 ms duration in each direction along each major axis. Total of six shocks.

**Safety** — CSA Certified (CSA 556 B).

## PHYSICAL CHARACTERISTICS

Dimensions	mm	in
Width	299	11.8
Height	381	15.0
Depth	591	23.3
<b>Weight</b> ≈	<b>kg</b>	<b>lb</b>
Net	32.0	70.5
Shipping	48.5	107.0

## STANDARD TEST FIXTURE (650-0459-01)

A plug-in fixture with two sets of five pin test terminals, the Emitter Grounded or Base Grounded switch, Left-Off-Right switch, Step Gen Output, Ext Base or Emitter input, and the Safety Shield. The test terminals accept either the six pin universal adaptors, three pin adaptors, or the high-power transistor adaptors with Kelvin contacts.

## ORDERING INFORMATION

### 576 Curve Tracer With Standard

**Test Fixture** **\$13,870**  
Includes: Standard test fixture (650-0459-01); transistor adaptor (013-0098-02); FET adaptor (013-0099-02); TO3 adaptor (013-0100-01); TO66 adaptor (013-0101-00); axial lead diode adaptor (013-0111-00); stud diode adaptor (013-0110-00); Kelvin sensors for large and small plastic transistors (013-0138-01); safety shield (337-1194-01); power cord (161-0066-00); instruction manual (070-0905-01).

### OPTION

**Option 01** — Deletes the auto scale-factor readout module but maintains provisions for insertion of the module (020-0031-00) at any time. **—\$935**

### CONVERSION KIT

**Auto Scale-Factor Readout Module** — Order 020-0031-00 **\$1,735**

### INTERNATIONAL POWER PLUG OPTIONS

**Option A1** — Universal Euro 220 V, 50 Hz.  
**Option A2** — UK 240 V, 50 Hz.  
**Option A3** — Australian 240 V, 50 Hz.  
**Option A4** — North American 240 V, 60 Hz.  
**Option A5** — Switzerland 220 V, 50 Hz.

## OPTIONAL ACCESSORIES

**Test Set-Up Chart** — Package of 250. Order 070-0970-01 **\$10**  
**Test Fixtures** —  
(172) See page 383. **\$5,335**  
(176) See page 384. **\$5,900**  
**Socket Adaptors** — See page 388.  
**Camera** — C-59A and adaptor. See page 453. **\$1,335**  
**Cart** — K217. See page 462. **\$495**