

## 172

Semiautomated Test Fixture

Tests Up to 11 Parameters

Reduces Total Test Time

### TYPICAL APPLICATIONS

\* Production Device Testing

\* Incoming Inspection

The 172 Programmable Test Fixture, when used with the Tektronix 576 Curve Tracer, permits the operator to quickly perform a sequence of tests on FETs, transistors, and diodes.

The 172 can greatly reduce total test time in applications when more than one measurement is made on a batch of many devices. Without the 172, all devices in the batch must be repeatedly inserted in the test fixture, once for every measurement. However, the 172 Programmable Test Fixture performs as many as eleven different tests on each device.

The 172 sequences through the various tests either automatically or manually. A



variable rate control is provided to set the test sequence at a rate which is best for the operator. New operators require more time per test, but with experience they will want to test at a faster rate. A front-panel switch or an optional foot switch advances the test in the manual mode.

TESTS THAT CAN BE PERFORMED ON:				PROGRAMMABLE CAPABILITIES
Test	Xstr	FETs	Diodes	
1**	$H_{FE}$ $V_{CE(sat)}$	$V_P$	$V_F$	Peak Current up to 10 A, Peak Volts up to 350 V.
2	$V_{BE}$			Horiz range is 100 mV/div to 2 V/div (other conditions same as Test 1).
3	$H_{FE}$ $V_{CE(sat)}$	$I_{DSS}$ $R_{DS(on)}$		Base Drive: 100 nA to 110 mA. When testing FETs the base terminal is shorted to the emitter terminal. Collector Sweep: three fixed ranges; 2 V, 5 V, and 20 V peak. Short circuit currents on these ranges are 1.5 A, 2 A, and 150 mA, respectively.
4	Same as #3			
5	$I_{CEO}$ or $I_{CES}$ $I_{CER}$ with external short or resistor			Voltage Supply: 1 V to 500 V dc. Leakage current measurements to 0.5 A. The most sensitive deflection factor is 1 nA/div.
6	$I_{CBO}$	$I_{GSS}$		Same as #5
7	$I_{EBO}$		$I_R$	Same as #5
8	$V_{(BR)CEO}$ or $V_{(BR)CER}$ with external resistor		$V_F$	Current Supply: 100 nA to 11 mA dc for breakdown voltage measurements to 500 V. Up to 110 mA dc for breakdown voltage measurements to 50 V.
9	$V_{(BR)CES}$	$BV_{GSS}$		Same as #8.
10	$V_{(BR)CBO}$	$BV_{GSS}$		Same as #8.
11	$V_{(BR)EBO}$		$V_R$	Same as #8.

\*\* All of the test conditions for Test 1 are controlled by the 576 front-panel controls. Test 2 has the same conditions as Test 1 except the horizontal amplifier is connected to the emitter-base terminals, and the horizontal deflection factor is controlled by the programming card.

For the remaining test the only 576 controls that are functional are the Polarity and CRT controls such as Intensity, Focus, Display Offset.

### CHARACTERISTICS

**VERTICAL AND HORIZONTAL AMPLIFIERS Display Accuracies** — The same as the 576 Curve Tracer with its included Standard Test Fixture.

**Vertical Deflection Factor** — Tests 1 and 2 (Collector or Emitter Current): 1  $\mu$ A to 2 A/div in 20/steps. Tests 3, 4, and 8, 9, 10, 11 (Collector or Breakdown Current): 1  $\mu$ A to 0.5 A/div in 18 steps. Tests 5, 6, 7 (Leakage Current): 1 nA to 0.5 A/div in 27 steps. All steps are in a 1-2-5 sequence.

**Horizontal Deflection Factor** — Test 1: 0.05 V/div to 200 V/div in 12 steps. Test 2 (Base Voltage): 100 mV/div to 2 V/div in 5 steps. Input Z for Test 2: At least 100 M $\Omega$  at 100 mV/div and 200 mV/div. 1 M $\Omega$  (within 2%) at 0.5 V/div, 1 V/div, and 2 V/div. Tests 3 and 4 (Collector Voltage): 100 mV/div to 2 V/div in 5 steps. Tests 5 through 11 (Breakdown or Leakage Voltage): 100 mV/div to 50 V/div in 9 steps. All steps are in a 1-2-5 sequence.

**Collector Sweep Voltage** — At least 2 V open circuit, or 1.5 A short circuit, at 100 mV/div and 200 mV/div. At least 5 V open circuit, or 2 A short circuit, at 500 mV/div. At least 20 V open circuit, or 150 mA short circuit, at 1 V/div and 2 V/div.

**Current Supply Accuracy** — 0.1  $\mu$ A to 11 mA, accurate within 2%  $\pm$  30 nA with up to 500 V compliance. 10 mA to 110 mA, accurate within 2%  $\pm$  30 nA with up to 50 V compliance. Increments of Current Are: 0.1  $\mu$ A (from 0.1  $\mu$ A to 11  $\mu$ A), 1  $\mu$ A (from 10  $\mu$ A to 110  $\mu$ A), 10  $\mu$ A (from 100  $\mu$ A to 1.1 mA), 100  $\mu$ A (from 1 mA to 11 mA) and 1 mA (from 10 mA to 110 mA).

**Voltage Supply Accuracy** — 1 V to 500 V, accurate within 3%  $\pm$  300 mV with at least 0.5 mA compliance.

**Test Display Time Range (Automatic)** — 400 ms to 1.5 s continuously variable. Manual operation from a front-panel switch or optional foot switch.

### ENVIRONMENTAL

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

**Altitude** — Operating: 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 minute 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.

### PHYSICAL CHARACTERISTICS

Dimensions	mm	in
Width	200	7.9
Height w/shield	165	6.5
Depth	315	12.4
Weights	kg	lb
Net	5.2	11.5
Shipping $\approx$	8.2	18.0

### ORDERING INFORMATION

172 Programmable Test Fixture **\$5,225**

**Includes:** Safety shield (337-1194-01); five programming cards (016-0198-00); 250 programming card pins (214-1633-00); five CRT overlay limit cards (016-0510-00); instruction manual (070-1170-01).