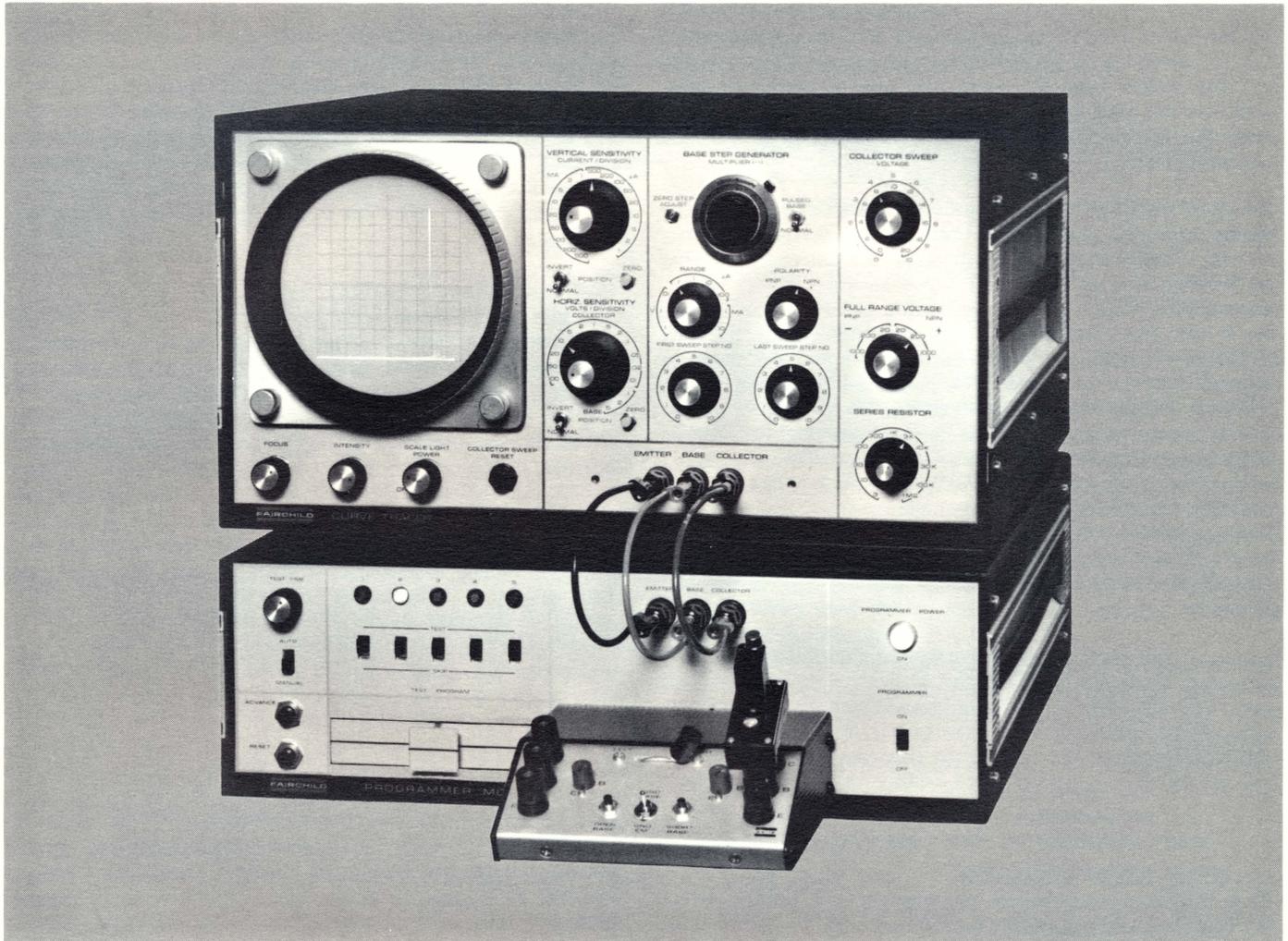


MODEL 6200B/P—3509B Programable Curve Tracer



FEATURES

- **Extremely Versatile**
Manual or programmed tests of FET's, bipolars, and unijunctions, SCR's, diodes.
- **Easily Programmed for Complex Tests**
Uses simple printed circuit programming cards with a diode voltage distribution matrix for up to five tests per device.
- **Fast Testing of Up to Five Parameters per Device**
Automatic (or manual) and adjustable from 20 to 180 milliseconds per test. Includes skip switches for omitting particular tests.
- **Pulsed Base Mode**
Lower duty cycle allows higher current device evaluation without destruction.
- **Wide Range Sweep**
From 20 volts at 5 amps to 1000 volts at 100ma.
- **Extended Base Drive**
Down to 100 na for high-gain devices; up to 35V for FET's.
- **Quick, Easy Base Generator Readout**
Accurate, direct readout of multiplier vernier.
- **Independent First and Last Base Step Selection**
Number of curves may be selected for optimum display.
- **Detachable Test Fixture**
May be operated from a remote location.
- **Optional Accessories and Modifications**
For ease in operation and fast product testing.
- **Compact — Lightweight — Rackmountable**
- **Solid-State Silicon Reliability**

DESCRIPTION

The Fairchild Model 6200B/P is a programmable semiconductor curve tracer with emphasis on those features needed to quickly test the latest devices. Sequential tests of different parameters may be performed by appropriate programming of its companion unit, the 3509B. Thus, the programming options extend its capability into the areas of quality control, receiving inspection and production testing, without sacrificing its versatility as a laboratory instrument.

The Model 6200B/P Programmable Curve Tracer is capable of displacing up to five independent characteristic curves automatically and in sequential order. Each curve is developed by driving one terminal of a semiconductor with a constant voltage or current and then sweeping the others with a half sine wave of voltage. If more than one curve is to be drawn per display, the driving source is stepped through several values and the sweep is repeated once for each step. The horizontal deflection of the CRT trace is chosen to correspond with either the driving voltage or to the sweep voltage across the device under test. The vertical deflection corresponds to the current drawn from the sweep source. The adjustment of the display sensitivity for each tested parameter is fundamental to the instrument's operation and therefore, must also be programmable. All of the functions of the Model 6200B/P which can be directly controlled through its reed relays by the Model 3509B Programmer, are indicated in the specifications section.

If you use the usual grounded emitter configuration for testing transistors, it results in a CRT plot of base or collector voltage versus collector current at the various drive levels. The connections can be interchanged to show curves for a grounded base configuration. For a FET, the curves show the gate or drain current and for an SCR, gate or anode voltage versus anode current.

COLLECTOR SWEEP GENERATOR

The collector sweep generator provides the full wave rectified sine wave sweep voltages. Both positive and negative sweeps over the three ranges of voltages are programmable. The fully adjustable peak values of 0-1000, 0-200 and 0-20 volts are controlled from the front panel. Two selectable series resistances, for programming, are also provided. These limit the maximum current to help protect the devices in the breakdown region. It also establishes the load line for the device under test.

BASE STEP GENERATOR

The driving source or input to the device under test is the base step generator. The step levels of the generator are determined by the range, multiplier and step number controls. The multiplier is a calibrated ten turn vernier which adds considerable convenience to the curve tracer. Not only does it allow precise selection of the drive levels, but it also permits rapid determination of SCR firing voltage and simplifies Beta measurements.

Full range, polarity and vernier settings are programmable. In addition to the manual vernier setting, three other fixed multiplier values are programmable. i.e. X1, X2 and X5.

PULSED OPERATION

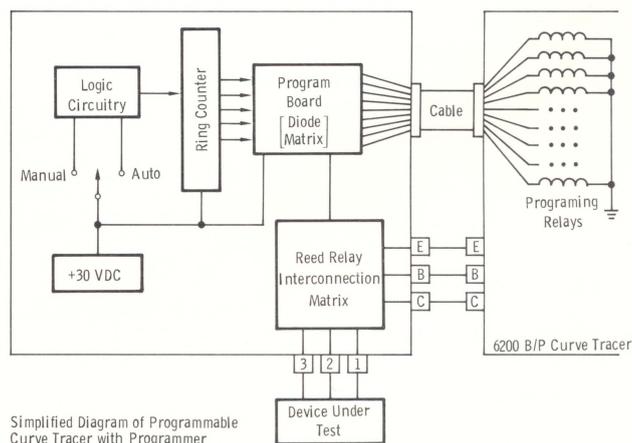
In addition to continuous voltage or continuous current drive, the 6200B provides "pulsed" operation. In this mode the drive is applied at the peak of the sweep and the device is only turned on for short periods of time. Thus the CRT shows the end points of the characteristic curves, and the power applied to the device is greatly reduced. Pulsed operation permits many devices to be checked without heat sinks and allows characteristics to be viewed at higher powers without exceeding safe dissipation levels. This mode of operation is also available as a programmable function.

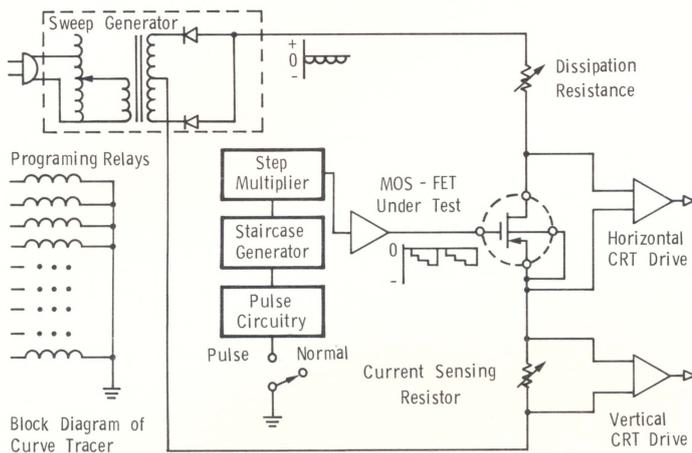
HORIZONTAL AND VERTICAL DEFLECTION

The deflection system combines high stability with excellent sensitivity. The vertical sensitivity extends to $1\mu\text{A}/\text{division}$ to accommodate the latest devices. Both the horizontal and vertical axis of the display can be inverted if desired. This permits PNP and "P" channel FET's to be viewed in a normal manner instead of upside down. Again, each position on these controls, may be operated by the companion unit Model 3509B.

MODEL 3509B PROGRAMMER

In order to actually program the various functions of the curve tracer, a voltage is required to energize each function's relay. This voltage is supplied by the Curve Tracer to the Model 3509B. A +30VDC supply provides the necessary voltage for these relays through the programmer's special circuits. Each unit contains a +30V supply, a six stage ring counter, a 9 reed relay matrix, and two printed circuit diode voltage distribution matrix cards. These matrix cards provide the actual program wiring as shown in the figure below. The relay matrix in the 3509B interconnects the leads of the device being tested with the 6200B/P in the correct configuration for the particular test of the moment. The ring counter provides for the proper sequence (either manually or automatically) of tests. The time per test is controlled by a knob on the front panel. If desired, any test may be skipped by moving its slide switch. Thus, five complete tests of specific parameters may be quickly displayed without touching any controls on the 6200B/P. Programming is simple and fast through the use of the plug-in diode matrix. Extra plug-in cards are available at a small additional charge.





SPECIFICATIONS: 6200B/P

COLLECTOR SWEEP GENERATOR

Sweep Ranges* — 0 to 1000 V, 100 mA.

0 to 200 V, 50 mA.

0 to 20 V, 5 Amps.

Sweep Frequency — Twice power line frequency.

Polarity* — Positive or negative.

Overload Protection — Magnet relay, with front panel reset.

Collector Series Resistance* — Selectable 3 ohms to 1 meg in eleven steps (Two programable values).

BASE STEP GENERATOR

Voltage Range* † (Continuously Variable) — 10 mV to 35 volts.

Current Range* † (Continuously Variable) — 100 nA to 500 mA.

Continuous Sweep Duty Cycle — 100%.

Pulse Mode Duty Cycle* — Less than 10%.

Number of Steps — 0 to 10. First and last steps selected independently.

Polarity* — Positive or negative.

VERTICAL DISPLAY

Collector Current* — 1 μ amp/division to 500 mA/division.

HORIZONTAL DISPLAY

Collector Voltage* — 10mV/division to 100 V/division.

Base Voltage* — 100 mV/division, 200 mV/division, 500 mV/division.

POWER

Voltage — 115/230 \pm 10%, approximately.

Frequency — 50-60 Hz.

MECHANICAL

Dimensions — Height: 9 $\frac{1}{4}$ inches (23.5 cm).

Width: 16 $\frac{3}{4}$ inches (42.5 cm).

Depth: 19 $\frac{1}{2}$ inches (49.5 cm).

Weight — Less than 50 lbs.

Price \$2,350.00

*Each function fully programable.

†Multiplier vernier setting and/or fixed values X1, X2, X5 (internal).

SPECIFICATIONS: 3509B

General — This unit will program the Model 6200B/P Curve Tracer to automatically display up to five tests on a single device.

Number of Tests — 1 to 5. (Up to 10 maximum on a special modification.)

Number of Output Lines — 50.

Device Lead Connection — The connections between the leads of the device under test and the 6200B/P Curve Tracer are controlled by a reed relay matrix in the 3509B.

Modes of Operation — Manual or automatic, selected by front panel switch.

Test Time (Automatic Mode) — Adjustable from 20 to 180 milliseconds per test, from front panel.

Power — From the Curve Tracer.

MECHANICAL

Dimensions — Height: 5 $\frac{1}{4}$ inches (13.3 cm).

Width: 16 $\frac{3}{4}$ inches (42.5 cm).

Depth: 19 $\frac{1}{2}$ inches (49.5 cm).

Weight — Less than 20 lbs.

Price \$600.00

ACCESSORIES & SPECIAL MODIFICATIONS

The Model 6200B/P when ordered with 3509B Programmer includes the following at no additional charge:

6200B/P — 3509B interconnect cabling, dual transistor test fixture, power cable, one set of programing cards (less diodes and program), and one instruction manual.

Additional Accessories

Dual Transistor Test Fixture (P/N 6620-30)\$65.00 each

High Speed Transistor Test Jig (P/N 3401-1560) \$50.00 each

High Speed Diode Test Jig (P/N 3401-1570)\$35.00 each

Long Lead Transistor Test Jig (P/N 3401-1580) \$10.00 each

Instruction Manual (P/N 8320-17)\$10.00 each

Plug-in Program Cards (2 ea. P/N 6114-25)\$50.00 each

Extender Card (P/N 6950-30)\$15.00 each

Additional Modifications

3509B-S03 Programmer for use with a standard 6200B/P and 3509B in order to extend total number of tests to ten. Must be ordered concurrently with 6200B/P and 3509B. \$850.00 each

7100A-S42 Digital Voltmeter plus curve tracer "D" option for digital readout of desired test parameter. V_{ce} , I_c , V_{be} , I_b , and the ratio of any two parameters including $H_{fe} = I_c/I_b$ may be readout with an accuracy of better than 2 per cent.

7100A-S42\$2550.00 each

Curve Tracer "D" Option\$955.00 each

Special Services

If desired, factory programing of program cards is available. Price per set of five parameters including diodes (customer furnishes sequence and parameters desired) but less cards:\$125.00 each

PARAMETER TEST CAPABILITIES

The following parameters are representative of those which can be automatically tested using the Model 6200B/P and its companion unit, the Model 3509B.

Diodes — BV_f , BV_r , I_a etc.

Transistors — H_{fe} (min. & max.), H_{fb} (min. & max.), V_{ce} (sat), V_{be} (sat), V_{be} (on), BV_{ces} , BV_{ceo} , BV_{cer} , BV_{cbo} , BV_{ebo} , BV_{eco} , LV_{ceo} , LV_{ces} , LV_{cer} , I_{ceo} , I_{cbo} , I_{ebo} , I_{ecs} , I_f etc.

Unijunctions — V_p , V_v , I_v , and above parameters.

SCR'S — BV_{gk} , BV_{ak} , I_{gf} , V_{gf} , V_f , V_r , I_h , V_{bo} .

FET'S — BV_{dss} , BV_{gss} , BV_{sgo} , BV_{dso} , BV_{dgo} , I_{dss} , V_p , V_{gsf} , G_m .

From most of the above, one can calculate all the "H" parameters.

