huntron instruments inc.

PRECISION TEST INSTRUMENTS

huntron instruments, inc.
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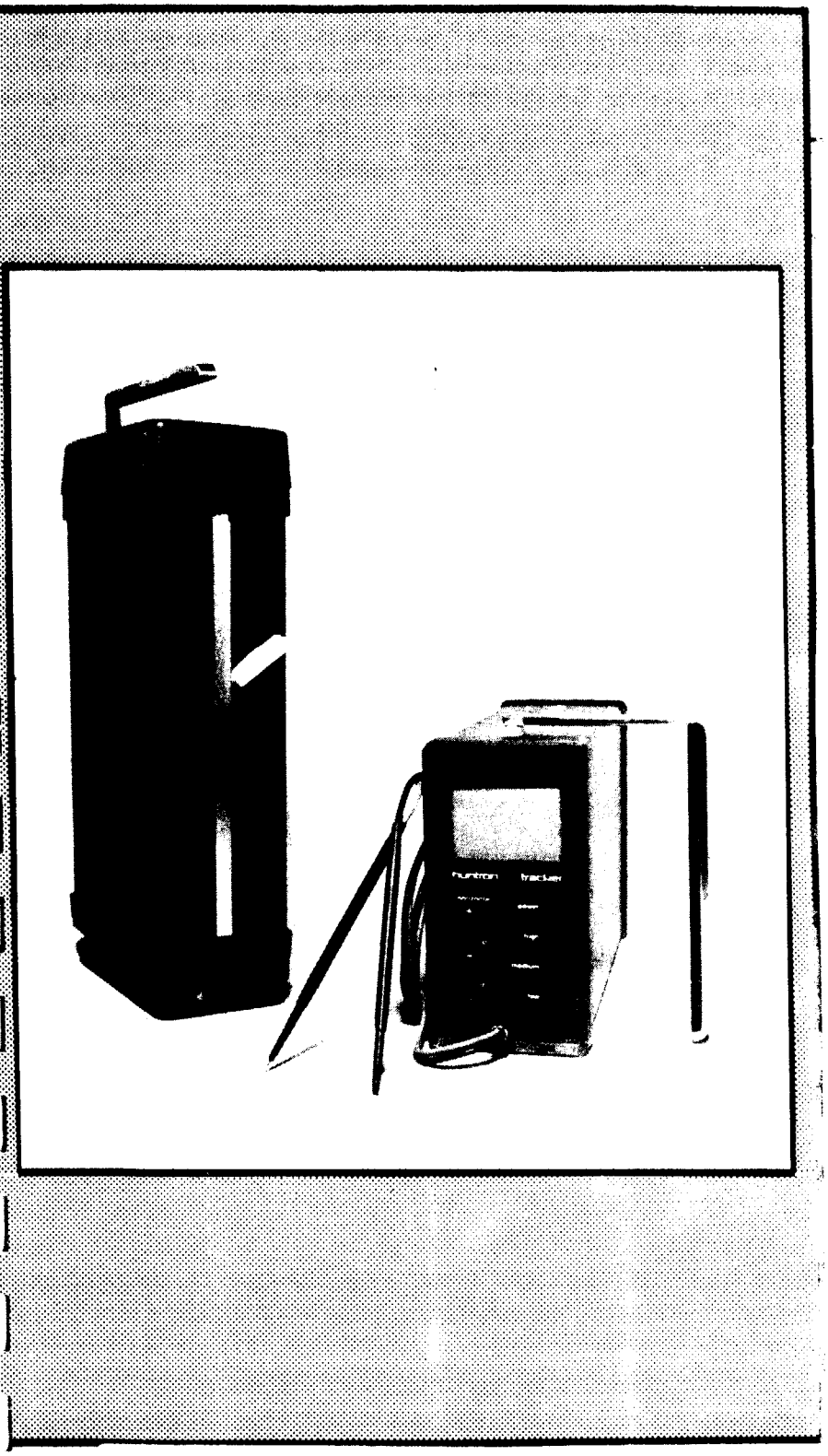


Introducing The

tracker

A new unique solid state troubleshooter

•features•

- **Accurately tests in or out of circuit with circuit loads of 10 ohms.**
- **Checks bipolar transistors, fet, unijunctions, diodes, zeners, led's, seleniums.**
- **Field tested for 3 years - thousands of tests with 95% accuracy.**
- **Simple to use push button operation.**
- **Junction tester with its own scope display.**
- **Shows forward and reverse characteristics simultaneously.**
- **Totally new and unique telescope test probes.**
- **Can be used to compare circuits**
- **Field or bench use.**

HUNTRON TRACKER

DESCRIPTION:

The Huntron Tracker you have purchased represents a new generation of test instruments designed specifically for troubleshooting and testing solid state components and circuits. The Tracker's unique capabilities apply to a wide range of electronics hardware including; telephony, radio, audio, computers and peripherals, CB, ham radio, automotive electronics, electro-medical equipment, Nav-Com and many more.

The Tracker will check IC's, bipolar transistors, Darlingtons, F.E.T.'s, diodes, L.E.D.'s, Zeners, unijunctions, bridge rectifiers, electrolytic capacitors, seleniums, gate control switches and diodes "back-to-back".

"IN-CIRCUIT" TESTING:

Unique, patented circuitry of the Tracker makes it possible to test components with shunt resistances as low as 10 ohms...and the Tracker has the remarkable ability to test solid state components "in-circuits". Testing circuits are "current-limited" to protect circuits under test.

SCOPE DISPLAY:

The Tracker's integral scope display visualizes both forward and reverse response of the device being tested. Only two, non-polar, leads are required since polarity is not significant to testing, and reversing leads merely changes the scope response from one side to the other, resulting in a display reversal.

CONTROLS:

Operating controls for the Tracker are simple and concise; three front panel controls to adjust the scope display for vertical/horizontal centering and brightness; rear panel focus control; power off/on switch; three impedance range switches—low, medium, high—designate the impedance presented at the test leads.

The low impedance setting will test junctions accurately and effectively down to a shunt resistance of 10 ohms. Medium range selection will test down to a resistance of 4,000 ohms while presenting a higher voltage to the device being tested. The high impedance position will test down to 5,000 ohms, also presenting higher voltages for testing. This can be extremely useful for testing high powered devices, as will be seen later in the instructions.

SPECIAL FEATURES:

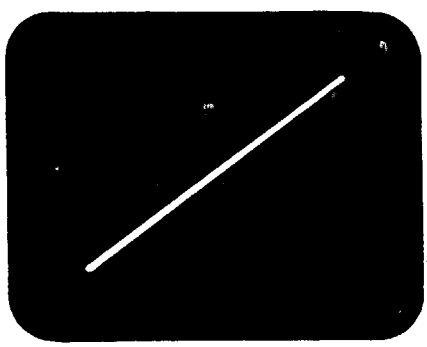
An exceptional feature of the high impedance circuit allows a transistor to be tested between emitter and collector with no damage to the transistor. This is a very useful test as it detects potential base punch-through.

The Tracker is very effective in testing direct-coupled circuits because it facilitates isolation and location of defective components WITHOUT REMOVING THEM FROM THE CIRCUIT.

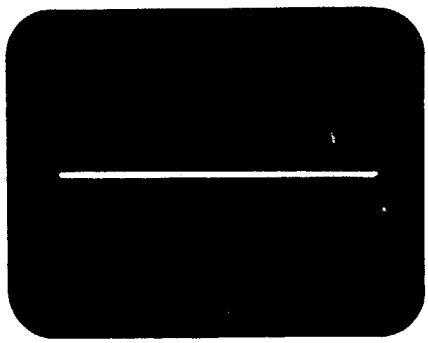
As the Tracker has a built-in oscilloscope, the visual response displays the reaction of a circuit to the test signal and ground or any other common comparing point. Example; a stereo sound system utilizing two identical channel circuits.

NORMAL SCOPE DISPLAYS

Power on, display adjusted for focus and vertical/horizontal center.



Low position

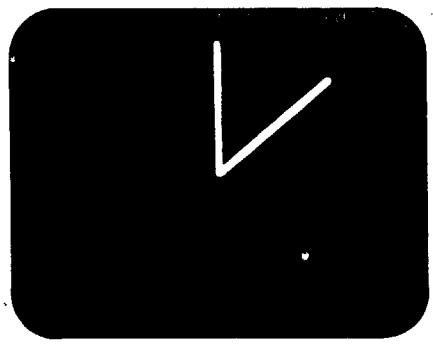


Medium position

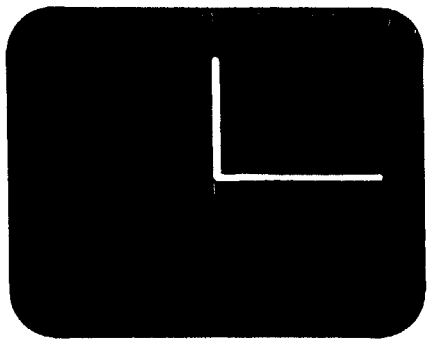
High position

SCOPE INDICATIONS FOR ACCEPTABLE DEVICES UNDER TEST

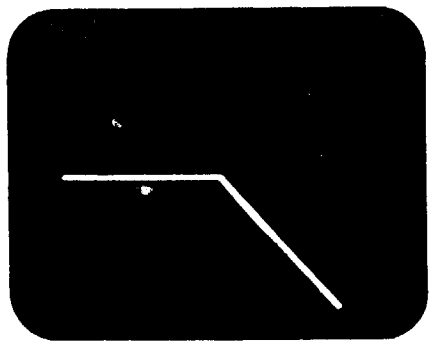
There are two significant characteristics of a satisfactory junction; 1-sharp angles, 2-straight legs.



Low impedance



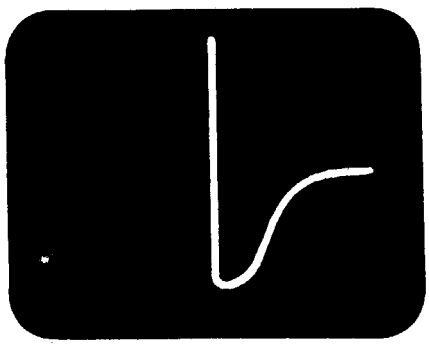
Medium impedance



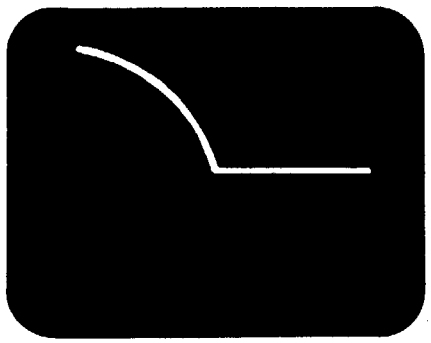
High impedance

SCOPE INDICATIONS FOR DEFECTIVE DEVICES UNDER TEST

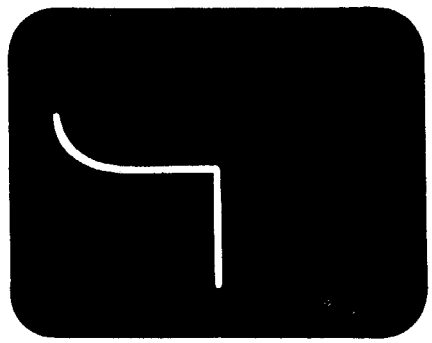
Any curved angle or curved leg displayed on the scope indicates a junction is leaking, and therefore defective.



Low impedance



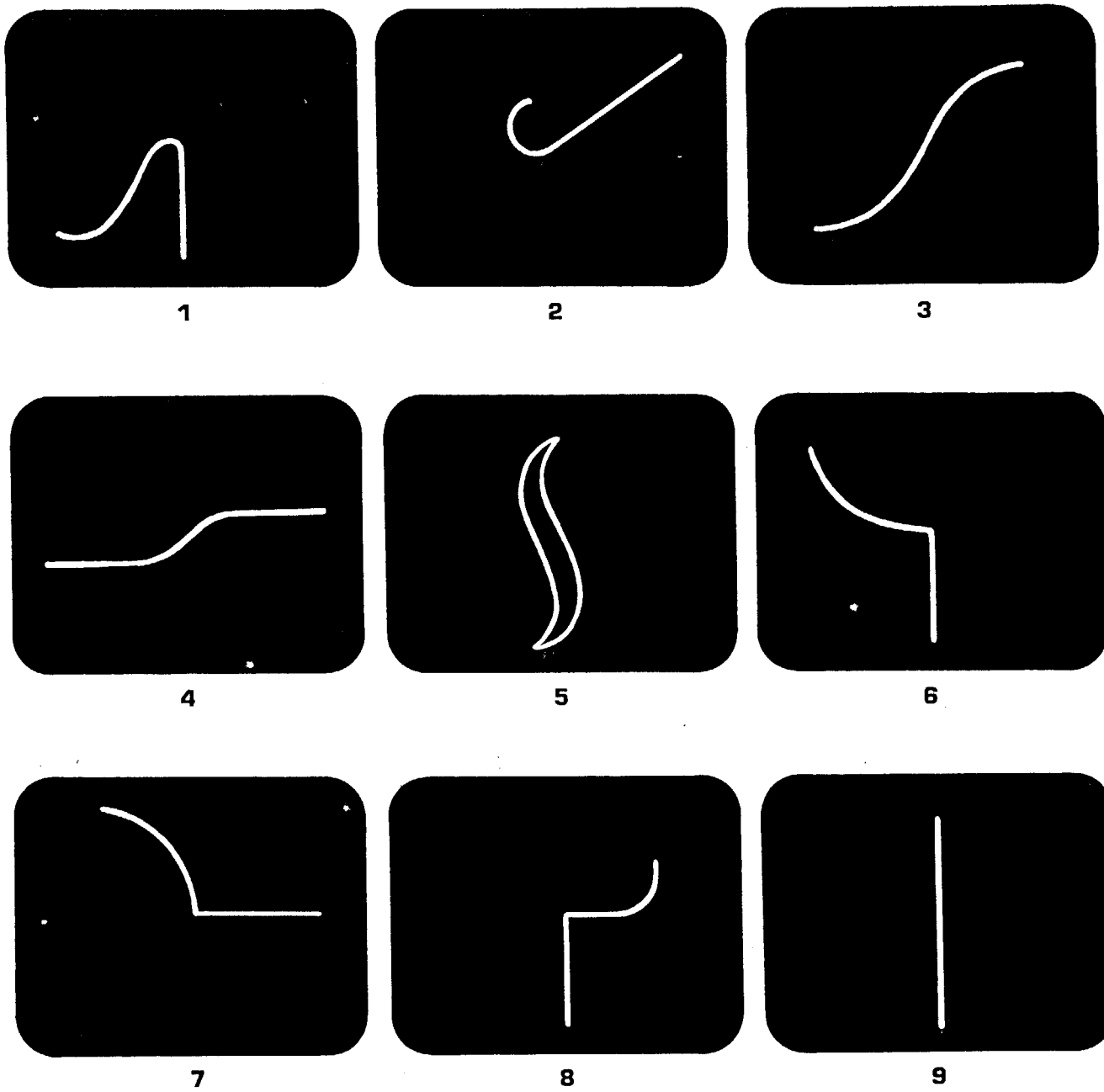
Medium impedance



High impedance

An "open" device or circuit will result in no display change!

TYPICAL INDICATIONS OF DEFECTIVE DEVICES UNDER TEST



In each of the first eight illustrations a leaky junction is indicated by a soft, curving angle or curved leg in some portion of the displayed image. Illustration 9 visualizes a shorted component. The same display will occur when the test leads are shorted, regardless of the impedance range being used.

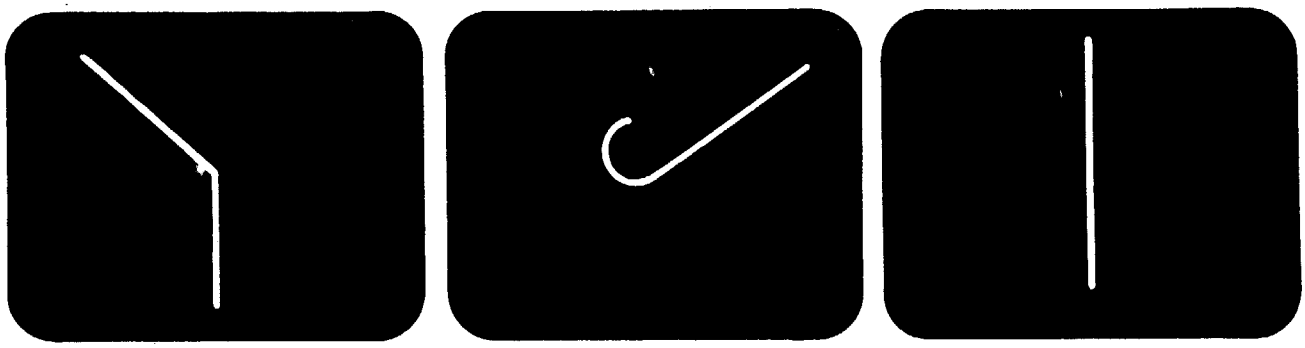
IMPORTANT! Displays **do not** indicate degree or extent of leakage!

TEST PROCEDURES.

TO TEST A DIODE:

Place one test lead on one end of the diode and the other lead on the opposite end. Pay no attention to polarity; it is not a necessary condition for testing.

SCOPE INDICATIONS OF DIODE TESTS



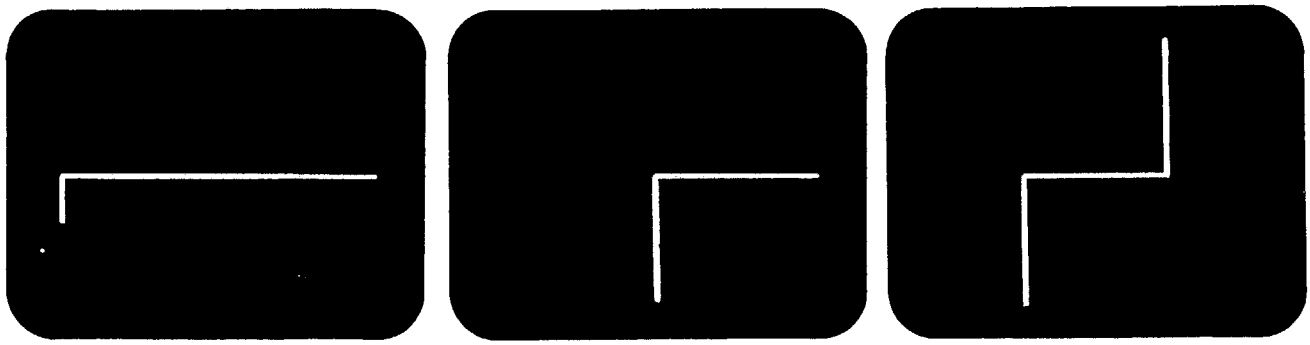
Good diode **Leaky diode** **Shorted diode**

NOTE: There is no fixed or static junction angle for the legs displayed. A good diode will exhibit straight legs and sharply defined angles without regard to the degrees of angularity.

TO TEST A TRANSISTOR:

With one lead on the transistor base; check the emitter, then the collector, with the second lead. A check should also be made between emitter and collector to check for base punch-through which may not show on the other two tests.

SCOPE INDICATIONS OF TRANSISTOR JUNCTION CONDITIONS



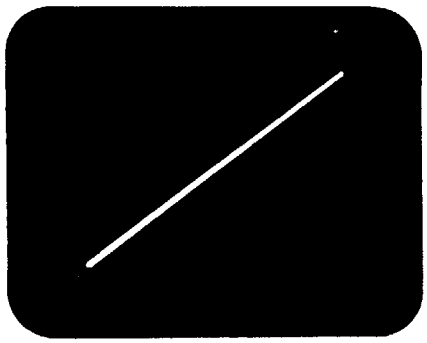
Emitter/collector **Base/collector** **Base/emitter**

Since all angles are sharp and all legs straight, the device is good.

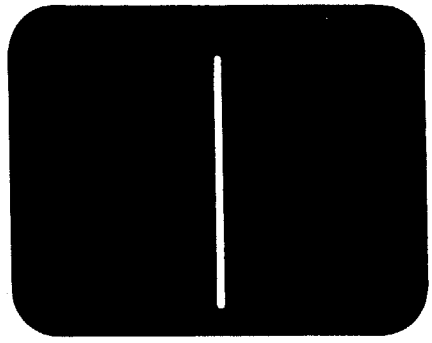
FUNCTIONS:

LOW IMPEDANCE

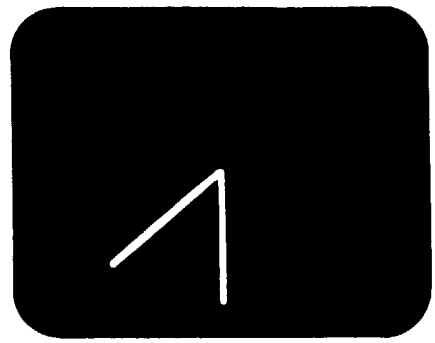
The low impedance range of the Tracker displays a diagonal line on the scope when no device is under test and the probes are not shorted. This position will accurately and effectively test components IN CIRCUIT with a circuit resistance as low as 10 ohms. This is especially useful for testing components in direct-coupled circuits with low impedance. THE LOW IMPEDANCE POSITION OF THE TRACKER IS USED PRIMARILY FOR IN CIRCUIT TESTING OF COMPONENTS.



Normal display

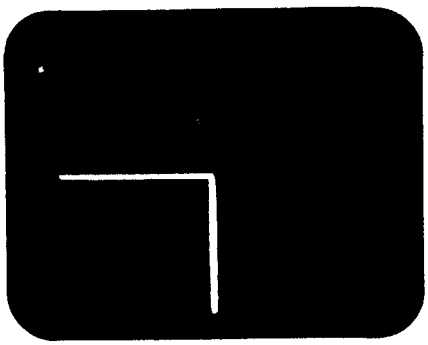


Shorted device

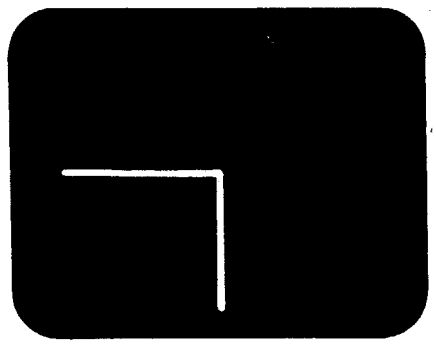


Good device

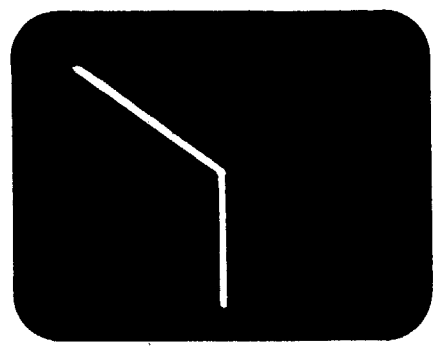
There is a relationship between the impedance of a device under test and the angle of the displayed form. High impedances result in sharp, "V" shaped displays. Lower impedances will show as very broad angles. As long as the angles are sharp, and the legs staight, the device is good.



High impedance

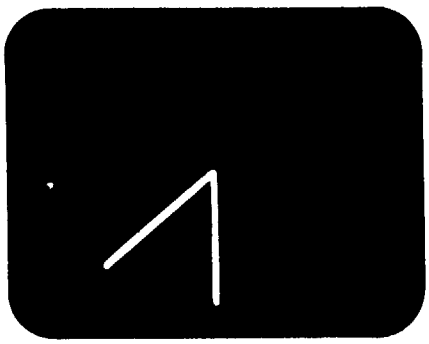


Medium impedance

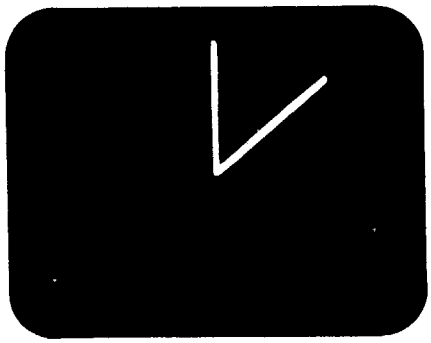


Low impedance

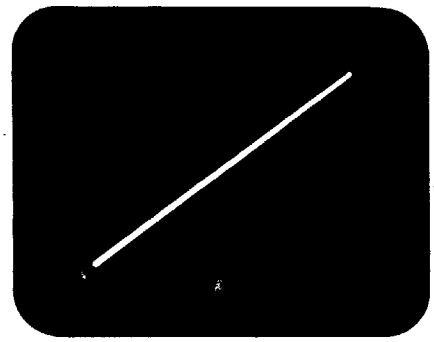
In transistor testing, the collector/emitter reading may not show in the low position due to the low test voltage presented to the probes. To provide the higher triggering voltage such junctions may require, step the impedance range selection up to the medium or high settings.



Good device



Leads reversed

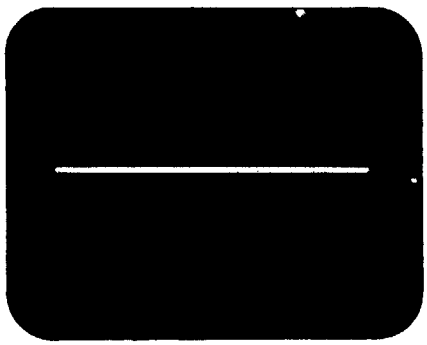


Good device

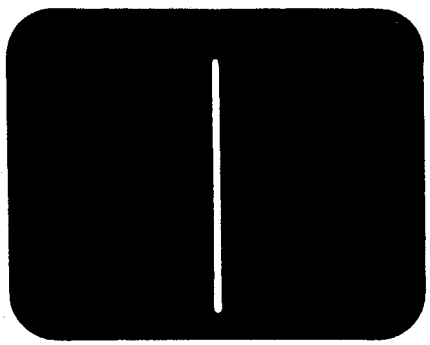
MEDIUM IMPEDANCE

HIGH IMPEDANCE

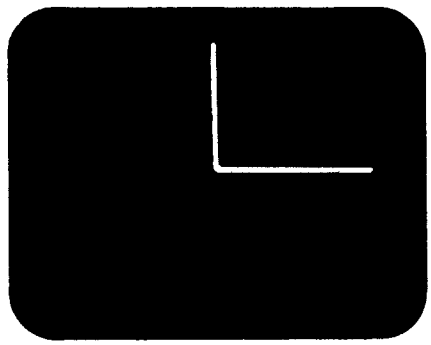
These impedance positions test much higher resistance ranges than the low position. The medium position tests down to 4,000 ohms and the high position down to 5,000 ohms. Increased test voltages are utilized in these positions. The normal scope display will be a horizontal line with no device under test and the leads not shorted.



Normal display



Shorted



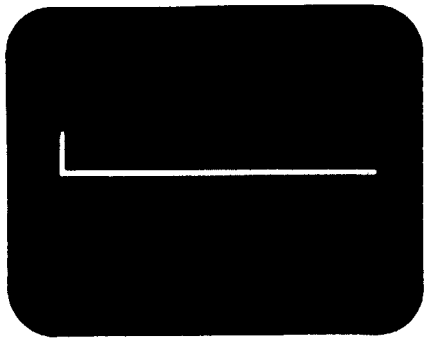
Good device

There are two distinctive scope displays in the medium and high impedance ranges;

1. The pattern that results from the Tracker's unique capability to test most transistors from emitter to collector without harm to the transistor.
2. A Zener effect display on most transistors when they are tested between emitter and base.

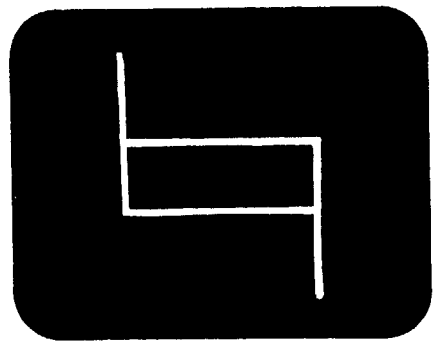
The number of angles displayed is unimportant. Each angle must display a sharp, un-rounded angle for component acceptability. Legs must be straight.

Emitter-collector



Good device

Emitter-base



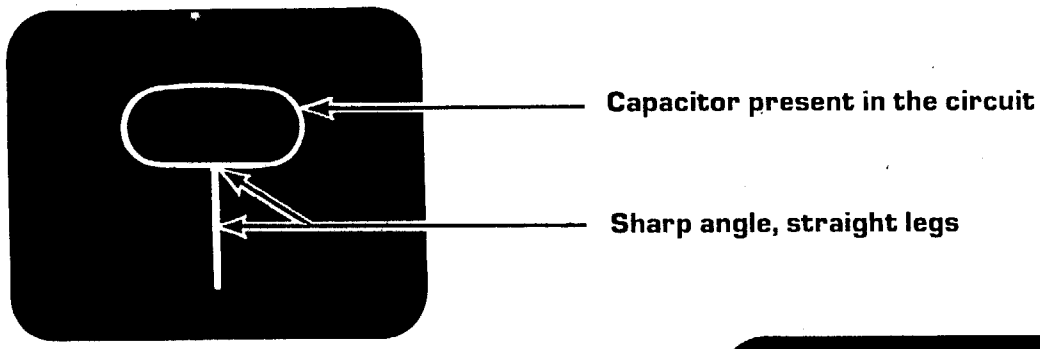
Zener effect

"IN-CIRCUIT" TESTING

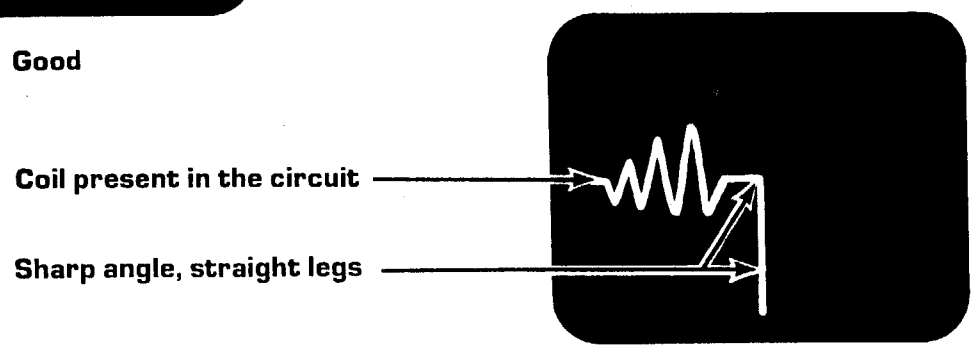
The Tracker may also be used for "in-circuit" testing in the medium and high impedance ranges IF THE CIRCUIT IMPEDANCE UNDER TEST IS ABOVE 4,700 OHMS.

"In-circuit" testing may present a variety of unusual displays on the scope, but the same junction rules apply; sharp angles and straight legs.

"IN-CIRCUIT" SCOPE DISPLAYS

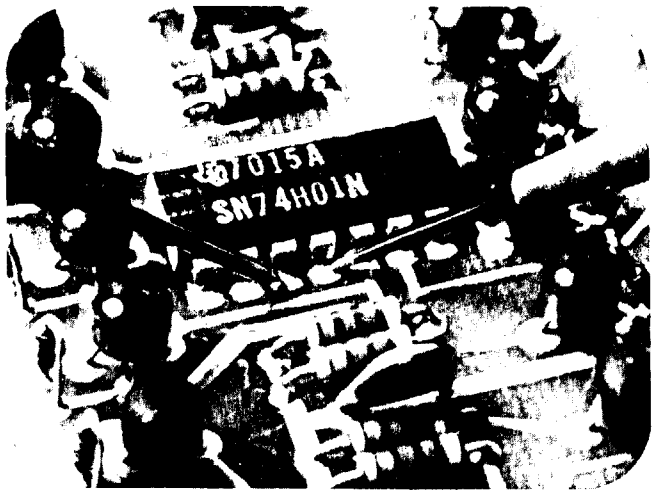


Good

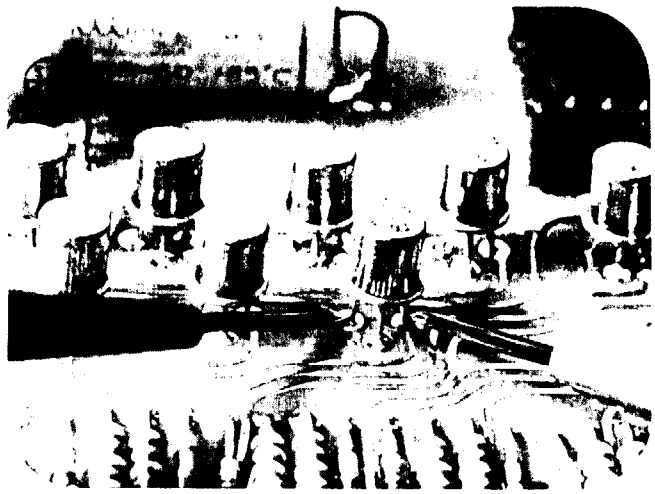


Good

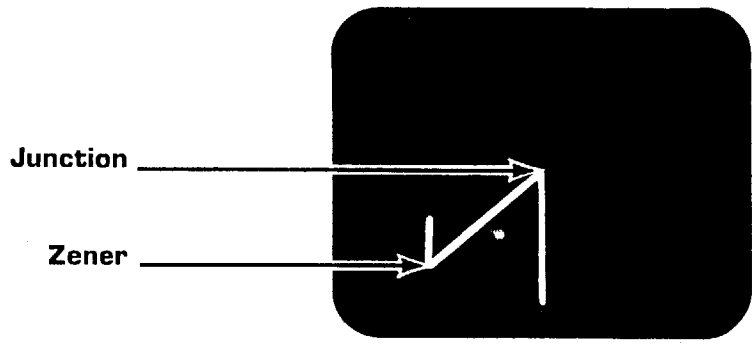
"IN-CIRCUIT" TESTING



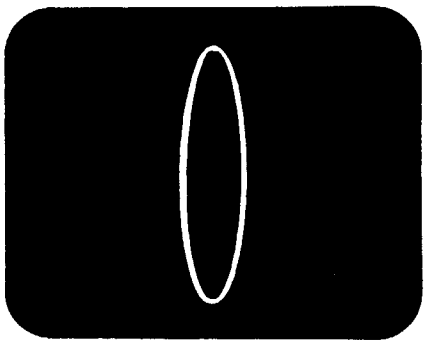
Testing an integrated circuit .



Two point transistor testing .



Good



Capacitor alone

Testing an electrolytic capacitor alone will result in a scope display ranging from a concentric circle to a wide variety of elliptical shapes, depending upon the value of the capacitor. The Tracker DOES NOT test capacitance.

SPECIAL FEATURE: COMPARITOR FUNCTION

An outstanding plus feature of the Huntron Tracker allows you to utilize your instrument as a COMPARITOR.

This exceptional function is made possible through a simple and direct application of the Tracker by introducing a signal to the device under test, which results in a specific response to the input signal, and is displayed visually on the oscilloscope screen.

The comparitor aspect must, obviously, involve two like devices for comparison, with one device established as a known, good, component or circuit.

PRINTED CIRCUIT COMPARISON

To carry out a comparative test of printed circuit boards, proceed as follows:

1. Locate a point on the two boards which will be common to the device, or devices, under test, such as the ground point or voltage source contact.
2. Inter-connect the two boards to be compared by means of a jumper wire fixed firmly to the established common points.
3. Place one Tracker test lead to the common point.
4. Place the second lead to like points on each board and compare the visual response of that portion of the circuit on the scope.

Using the known, good, board as the correct visual response, a defective circuit, section or component may be quickly and easily located.

INTEGRATED CIRCUIT COMPARISON

To test an integrated circuit—in-circuit—use the same basic procedure:

1. Locate a common connection on the two IC's to be compared, such as the ground or voltage input connections.
2. Link the common points on both IC's with a jumper wire.
3. Place one lead on the common point connection.
4. Place the second lead at like points on the IC's being compared.

The known, good, IC will display a specific scope response at each test point. Variations from the good device response indicates a defective IC.

DISCREET DEVICES

Through the use of these simple steps you may use your Huntron Tracker to compare discreet devices—and in each case you may do so with the device in or out of circuit.

HUNTRON TRACKER

LIMITED WARRANTY

For a period of one year from the date of its purchase new and undamaged from Huntron Sales, Inc., HUNTRON INSTRUMENTS, INC. will, without charge, repair or replace, at its option, this product if found by it to be defective in materials or workmanship, and if returned to HUNTRON INSTRUMENTS, INC. at its factory, transportation prepaid. This limited warranty is expressly conditioned upon the product having been used only in normal usage and service in accordance with instructions of HUNTRON INSTRUMENTS, INC. and not having been altered in any way or subject to misuse, negligence or damage, and not having been repaired or attempted to be repaired by anyone other than HUNTRON INSTRUMENTS, INC. or its authorized agent. EXCEPT FOR THE FOREGOING EXPRESS WARRANTY OF REPAIR OR REPLACEMENT HUNTRON INSTRUMENTS, INC. MAKES NO WARRANTY OF ANY KIND, INCLUDING BUT NOT LIMITED TO, ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, AND HUNTRON INSTRUMENTS, INC. SHALL NOT BE LIABLE FOR ANY DAMAGES, WHETHER DIRECT OR INDIRECT, CONSEQUENTIAL OR INCIDENTAL, FORESEEABLE OR NOT, OR OTHERWISE, BEYOND REPAIR OR REPLACING THIS PRODUCT.

SPECIFICATIONS

Power supply: 115 V ac

Size: 3.375 in.(H)
10.00 in.(W)
11.25 in.(D)

Weight: 4.50 lbs.

Scope: 2x3 inch with glare reduction lens

Controls: Scope—horizontal, vertical, brightness
Ranging—3 impedance range switches; low, med., high

TESTING RANGES

Low Impedance	current	voltage	power factor
Current with leads shorted	219 MA		
Across diode	118 MA	2.5 VAC	.284 Watts
Across diode shunted by 10	171 MA	.7 VAC	.61 Watts
Across diode shunted by 100	118 MA	2.2 VAC	.150 Watts
Across diode shunted by 100+	118 MA	2.5 VAC	.284 Watts

Medium Impedance	current	voltage	power factor
Current with leads shorted	1.27 MA		
Across diode	.715 MA	8.5 VAC	.0078 Watts
Across diode shunted by 1.8k	1.16 MA	.8 VAC	.0013 Watts
Across diode shunted by 100k	.690 MA	7.5 VAC	.0069 Watts

High Impedance	current	voltage	power factor
Current with leads shorted	2.44 MA		
Across diode	1.35 MA	18 VAC	.0223 Watts
Across diode shunted by 1.8k	1.36 MA	1.85 VAC	.0027 Watts
Across diode shunted by 100k	1.37 MA	15 VAC	.0219 Watts

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