

OPERATING INSTRUCTIONS FOR THE

MICRONTA[®]

TRANSISTOR TESTER

Catalog No. 22-024

CUSTOM MANUFACTURED FOR

RADIO SHACK  A DIVISION OF TANDY CORPORATION



OPERATING INSTRUCTIONS :

Radio Shack's new 'Micronta' Transistor Tester is capable of checking a wide range of transistor types, either "in circuit" or out of circuit. It has been specially designed to take advantage of the newest concept of dynamic testing under current amplifier conditions.

To use, simply plug the transistor to be checked into the front panel socket, or connect it with the alligator clip test leads provided. No preliminary set-up is needed. The unit safely and automatically identifies low, medium and high-power PNP and NPN transistors.

It provides a visual indication of signal output, giving positive information on the following tests simultaneously :

- (A) Electrode Open Circuits
- (B) Short Circuits
- (C) Current Gain

The visual indication of the output signal is the result of dynamic current gain in an actual operating circuit. Further leakage tests are unnecessary, as the dynamic distribution of leakage is taken into account in testing.

The 'Micronta' Transistor Tester also permits matching similar transistors in actual operating circuits, and provides a reliable GO/NO-GO test at practical collector currents (from 5 ma on small signal types to 50 ma and more on power types). Match similar type transistors by observing and comparing dial readings; the higher the reading, the higher the gain.

To determine distributed leakage, note the firing point of the lamp. The brilliance of the neon lamp gives an indication of greater or lesser output. An adjustable base current control allows you to test transistors over a broad range of current conditions. If operation at increased current is desired, an additional load resistor may be inserted in the jacks.

The use of an AC voltmeter or oscilloscope as an output indicator will show a measurable output on collector currents as low as 5 ma. Jacks are provided for use with these instruments for :

- (1) providing amplitude signal output indications
- (2) making sensitive noise tests
- (3) studying dynamic leakage distribution
- (4) wave form inspection

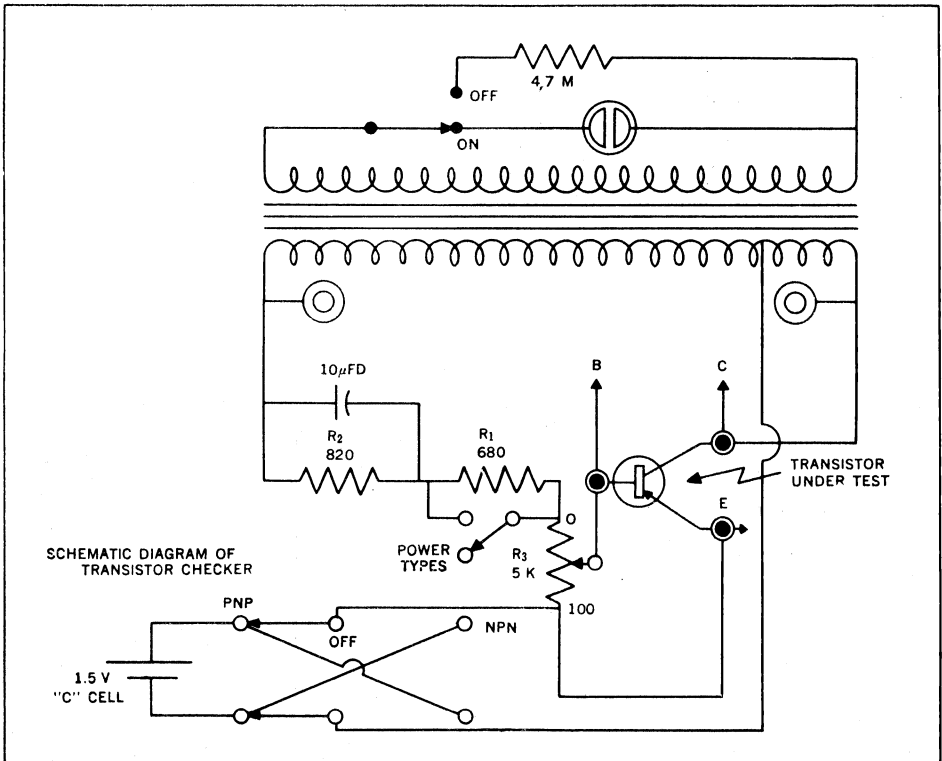
PRINCIPLES OF OPERATION :

A specially designed pulse signal generator is utilized in the Transistor Tester. With a transistor connected to the test instrument, the AC signal developed in the primary winding is stepped up to the voltage necessary to fire the neon glow lamp (#NE-51)

The brightness of the indicator lamp varies in direct proportion to the signal output; hence, the greater the output, the brighter the lamp will glow. When using this unit with a voltmeter or scope, the lamp switch is opened (OFF) to prevent clipping or limiting due to the lamp being left in the circuit.

For "quick check" applications, set the base current control knob at "0". Advancing the knob will then reduce the base current to establish the power operating collector currents. The higher the dial reading at the point a given transistor drops out of operation, the higher the gain

(Refer to Schematic Diagram Below)



The "GO/NO-GO" position is for "quick-check" use. R1 is normally shorted out on small-signal transistors, and open on power types. R3 serves as a base current control, and also furnishes feedback control. (Feedback and base current are maximum at GO/NO-GO.)

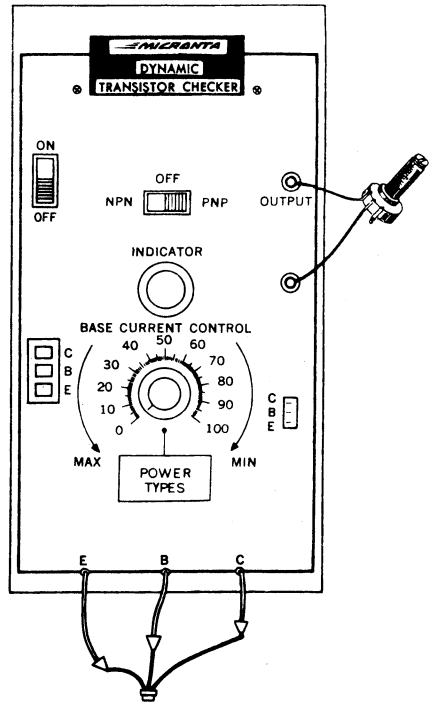
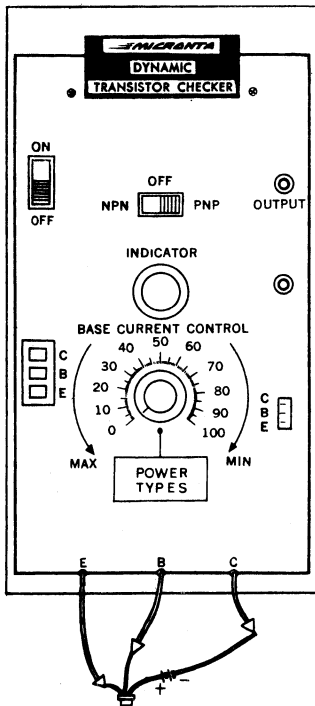
In matching similar type transistors, observe the point of output signal "dropout". Minimum base current occurs at "100". If the dynamic leakage distribution of both transistors under test is similar, then oscillation "dropout" will occur at the same dial setting for each. Naturally, since the dial is not calibrated, these reading will serve for comparison purposes only.

To take advantage of the maximum versatility available in the Transistor Tester, you will want to note these suggestions:

By connecting extra batteries in series with the collector leads, increased operating potential is available (see Fig. 1).

By connecting a 500 ohm variable resistor across the output jacks, increased current loading is possible on power type transistors (see Fig. 2).

OPERATING INSTRUCTIONS :



1. Turn base current control knob to "0".
2. Turn lamp switch to "ON".
3. Set PNP/NPN slide switch selector to the type under test. If you do not know the correct type, see Step 6 below.
4. Insert transistor in socket or connect test leads: E (black), B (green), C (red).
5. Neon indicator lamp will glow if transistor is providing current amplification ; this means it is not "open" or "shorted".
6. CAUTION: Transistors will fire the indicator lamp only if the NPN/PNP selector switch is set in correct position. However, no damage can occur with switch in wrong position as long as the base current control knob points to "0".
7. To match similar type transistors: note the dial setting at which the lamp glows or output "drops out". The higher this setting, the greater the gain will be, since the base current decreases as the setting is turned towards "100". Maximum base and collector currents occur at "0".
8. Power types should be tested with control knob set to "POWER TYPES". Match as indicated above.
9. If ample output is available, attach the collector lead to the battery contained in the test unit.
10. In case of excessive loading, isolate the transistor's emitter lead and attach the "E" test lead to the emitter lead, continuing test with all other leads in place.
11. Type selector switch should be left in OFF (center) position when instrument is not in use

IN-CIRCUIT TEST PROCEDURE :

For in-circuit testing, the resistor R1 is shorted by switching control knob to POWER TYPES position. Attach test leads to the in-circuit transistor. If a radio or an audio amplifier is being tested, its gain controls should be set at maximum in order to minimize base circuit loading. On the great majority of transistors, the output will be sufficient to fire the neon indicator. If the radio is turned on, the generated tone will also serve as a signal injector, and the output tone will be heard in the speaker. If the tester's built-in power supply furnishes too little output, the collector may be moved to the collector supply end of the battery ; this increases the collector voltage, but does not change the base current supply.

CHECKING VERY LOW CURRENT TRANSISTORS :

1. If the output is not high enough to operate the indicator lamp, use a voltmeter (preferably a VTVM type) or an oscilloscope to get an output indication.
2. Set control knob at "POWER TYPES" and note change, if any.
3. Rotate base current control from "0" through "100" and note whether output is best at some point other than the usual "0" position.

4. Insert additional batteries in series with the collector lead only. Observe polarity: negative end of battery goes to collector on PNP types; positive end on NPN. See schematic diagram.
5. Since the neon lamp loads the transformer only when it is glowing, keeping the lamp switch in the "ON" position while checking very low outputs will provide greater output at the test jacks. A 470 ohm resistor loads the transformer when lamp is "OFF".

NOTE:

To check battery condition, touch the E and C test clips together briefly; neon lamp should flash if battery is in good condition.

When the voltage across a 100 ohm resistor connected between E and C reads less than 1.1 volts DC, replace battery with a fresh one.

Never operate the tester with the neon lamp out of its socket! The lamp serves as a voltage limiter and regulator, and without it, dangerously high voltages can result.

TRANSISTOR SYMBOL CHART

1 	2 	3 	4 	5 	6
7 	8 	9 	10 	11 	12
13 	14 	15 	16 	17 	18
19 	20 	21 	 TRANSISTOR SYMBOLS E - EMITTER C - COLLECTOR B - BASE S - SHIELD REPRINTED BY PERMISSION OF PF REPORTER		

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