A READER BUILT IT!

Circuits and devices which we have not actually tested in our laboratory but published for the general interest of beginners and experimenters.

VALVE TESTER CHECKS SHORTS, LEAKAGE

From Mr A. D. Fuller, of 406 Pennant Hills Road, Pennant Hills, N.S.W., comes the following description of a simple valve tester. It tests most common domestic valve types for gas, grid-cathode shorts and heater-cathode leakage. It is inexpensive to construct and should prove useful to servicemen and experimenters alike. Mr Fuller writes:

"MANY readers of this journal may require the use of a valve tester where the cost of a professional type would not be justified. The number of different valve socket connections is so great it is difficult to design a valve tester to make all the required tests. However, some of the usual tests can be dispensed with in a simple type of tester.

"The circuit described below is similar to one in the American 'Radio Electronics' for October, 1954. However, a different switching system and more sockets have been used to make it more versatile. Almost any type of valve except battery types may be tested. The tester checks only shorts, leakage, gas or grid current. Open circuits are apparent in most cases, and some idea of the emission is given by the amount of glow of the neon lamp.

"Switch No. 2 is set to the cathode pin number, and switch No. 3 to the grid number. Switch No. 1 when in the grid-cathode position will cause the neon lamp to glow if the valve draws grid current, is gassy, or has a grid-cathode leakage of about 20 megohms or lower. Switch No. 1, when in cathode-heater position will cause the neon lamp to glow if there is a cathode-heater leakage of 2 megohms or lower.

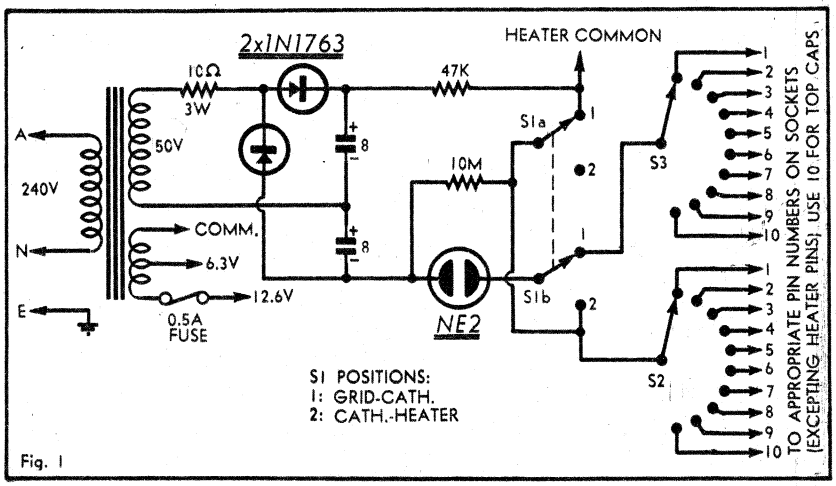
"If the valve to be tested has a 6.3 volt heater it is plugged in the left hand octals, 9 pin, or 7 pin socket, and if it has a 12.6 volt heater it is plugged in the right hand socket. There are two pairs of octal sockets, one pair for valves having the heater on pins 2-7 and the other pair for those having the heater on pins 7-8. Twelve (12) contact switches are used, but only 10 contacts are used, contact 10 is used for the top cap.

"To check other elements besides heater, cathode, or grid, set switch No. 1 to the grid-cathode position, then set switch No. 2 to contact 1 and turn switch No. 3 from 1 to 10. Then set switch No. 2 to contact 2 and turn switch No. 3 from 1 to 10, and so on. If plate or screen connects to the positive side of the power supply and cathode, to the negative side, the valve will conduct and the neon lamp glows.

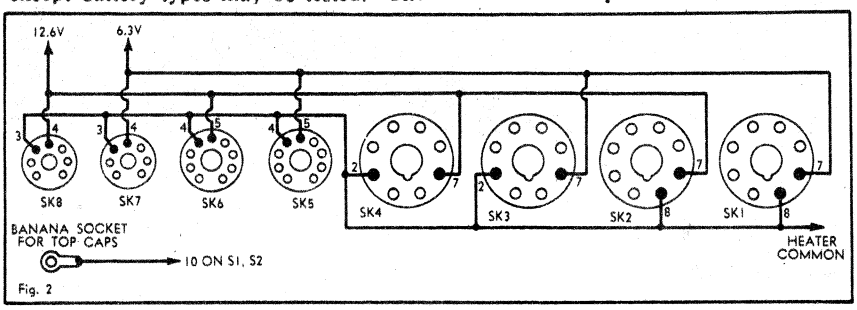
"To make sure that this is not due to leakage reverse the order of the switches, to reverse the connection to the power supply. If there is no leakage the neon lamp should then go out.

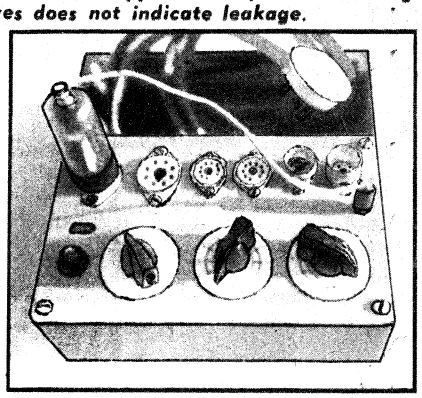
The power transformer has a 50 volt secondary as it was home made. This type may not be available but any small power supply of about 150 volts D.C. will do. A box about 8 inches by 6 inches by 2½ inches will house the parts.

"As an example of how a valve is tested take the case of a 6BM8-ECL82,



Above is the circuit for the power supply and switching section of the tester, and at lower left the test socket heater connections. Octal valves type 6AR7GT and 6B7S have heater connections differing from the two normal pairs of connections, and cannot be tested unless another socket is added to suit them. Many 12V miniature 9-pin valves have a centre-tapped heater, and a reading on pin 6 or 9 for these valves does not indicate leakage.





The prototype valve tester, which has been in use for some time. Only two octal sockets were fitted when the photograph was taken.

triode-pentode. Plug the valve in the left hand 9 pin socket, set switch 2 to 8 and switch 3 on 1. Set switch 1 to cathode-heater, then to grid-cathode. Th's checks the triode for gas, grid current, leaks, or shorts. Then set switch 2 on 2 and switch 3 on 3. Set switch 1 to cathode-heater, then to grid-cathode. This checks the pentode.

"If a valve tests faulty it should be regarded only as a guide to what to do, as it depends on the application as to whether it will function. Care must be used in testing valves from hybrid type car radio sets. Refer to article in Radio, Television and Hobbies, May, 1961, page 69. Switches 2 and 3 of the tester may be left on the same contact number when the tester is not in use. The neon lamp then serves as a "power on" indicator.

"The correct socket to use for a valve should be found from valve data handbooks, which will also give details of the cathode and grid connections, common electrode connections, etc.

"I found it convenient to make up guide sheets showing switch settings and expected lamp readings for all the common valve types, using the data books as reference. This saves quite a lot of time when one is checking the valves in a large unit like a TV set, and is thus well worth the effort. On my sheets I list the two switch settings, the plate and screen pins for reference, the pins for any diode plates present, and the test socket to use. Other constructors may care to list other data as well.

"I have used the tester to test many types of valves and have found it very satisfactory. All the valves in a typical TV set can be tested in about 15 minutes (if they can be found!).

"When I made the tester I left out the two 12.6 volt octal sockets; hence the six sockets visible in the photograph compared with eight shown on the circuit. The extra sockets have since been added to increase the usefulness of the unit.

"Octal valves type 6AR7GT and 6B7S have heater connections which are different from the usual pins 2-7 or 7-8 connections. They thus cannot be tested unless a further octal socket is added.

"Nine-pin 12.6V valves like the 12AT7, 12AU7, 12AX7, 12BH7, and 12BY7 have a centre-tapped heater, and with these a reading on pin 6 or 9 does not indicate leakage.

"Other articles on valve testers of the less complex type that can be made with few parts can be found in the following publications:—

'Radio Electronics,' October, 1954.
'Radio Electronics,' December, 1958.
'Electronics World,' December, 1954.
'Radio Television and Hobbies,' January, 1951.