MAKING AN ADAPTER TO TEST 8122 RF TUBES IN A STANDARD EMISSION, DYNAMIC, OR MUTUAL CONDUCTANCE TESTER

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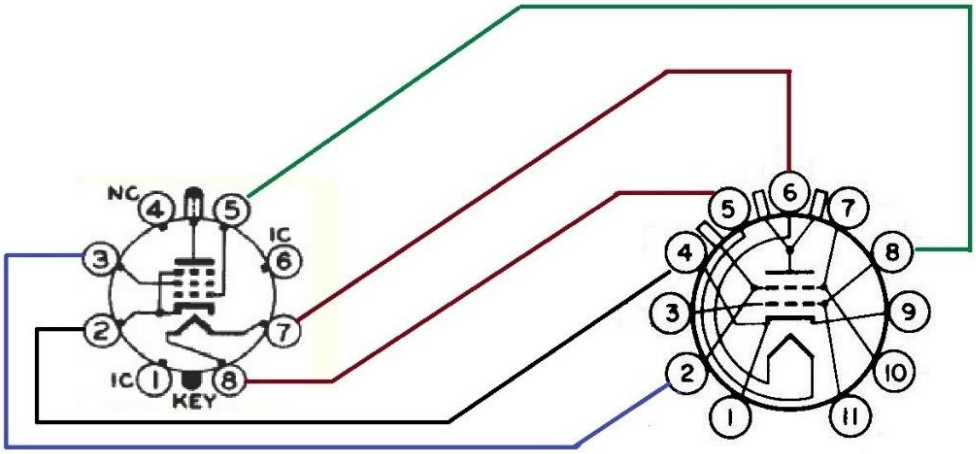
The purpose of this paper is to allow the reader to build an adapter to test an 8122 RF tube in an emissions/transconductance/mutual conductance tube tester. Since the maximum plate voltage of most tube testers like the Hickok's, EICO's, and others is 250 volts or less, the only meaningful thing this adapter will be able to determine is the relative strength of two or more tubes. The settings in the table below have been adjusted so that a strong, NOS 8122 will give a reading that is within the "GOOD" range on the tube tester meter. By either coincidence or luck, a NOS 8122, when tested using the settings for a 6LW6 (or 36LW6) shown in the data book for the EICO 667, a NOS 8122 shows a meter reading of 100.

The wiring for the adapter is relatively simple. NOTE: Without the benefit of fan-forced cooling, the 8122 will get very hot in a short period of time, even at a plate voltage that is only a tenth of its maximum stated value.

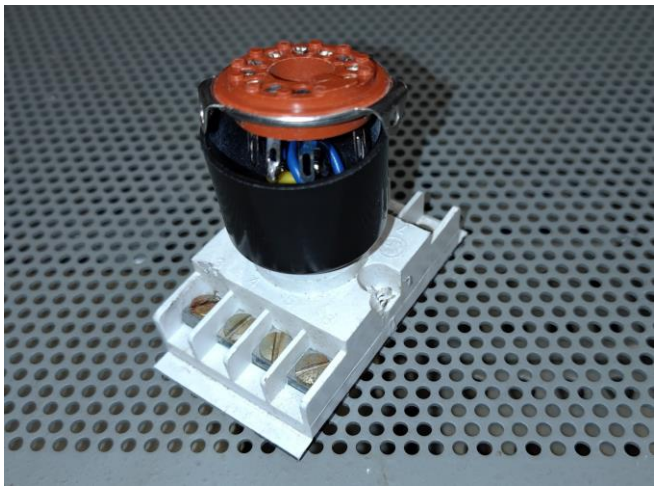
Bottom View of 6LW6 Octal plug to 8122 socket



CONNECTIONS

- **Pin 7 on the Octal plug to Pin 6 on the 8122 socket**
- **Pin 8 on the Octal plug to Pin 5 on the 8122 socket**
- **Pin 5 on the Octal plug to Pin 3, 8, or 11 on the 8122 socket**
- **Pin 3 on the Octal plug to Pin 2, 7, or 10 on the 8122 socket**
- **Pin 2 on the Octal plug to Pin 1, 4, or 9 on the 8122 socket**

So far, the adapter has been used with only two testers: An EICO 667, a Hickok 800a. This is a prototype, made using a vintage Bakelite Octal plug which cracked due to stress. The white base is just for display.



EICO 666/667: Using the 11-pin to 8-pin octal adapter shown above and a new Eimac 8122, my recently refurbished EICO 667 showed a reading of about 100, using the settings for a 6LW6/36LW6 tube and a filament voltage of 12.6 volts. The other 8122's that came in my Hurricane tested proportionally lower. They are RCA tubes, marked 3-10-2016. The best one came in at about 90, while the one with the lowest output was in the **?** range, about 80.

While an emission test is no substitute for an in-situ test or a tester that applies appropriate voltages, it may be useful for "culling" a box of tubes. One important note: even with only 205-220 volts on their plates, the little metal 8122 tubes get finger-burning HOT very fast, so testing must be done quickly.

EICO 667 TESTING A NEW 8122

HICKOK 800a: The document titled *Consolidated Test Data for Hickok Model 533A-600A-605A Tube Testers* has settings for the 6LW6 and a few *LW6 variants with different filament voltages. The 8122 comes in on my Hickok 800a at almost the same reading as the with my EICO. The difference is that the bias control on the 800a needs to be set to 40. That sets the G1 voltage at about -9.4 volts. The published 6LW6 setting of 72 for the bias results in -40 volts, which cuts off the 8122, resulting in zero output.

Hickok 800a testing a functional 8122

TESTER	FIL	SELECTORS	BIAS (grid)	PLATE	ENGL	TEST	REMARKS
EICO 667	12.6	6136562-111114 V S : 2 & 1	60	80		Merit	Leak: use 667 2,3,5,C
HICKOK 533a-600a-605a-800a	12.6	JX-5031-0	40		88	P4	Hickok tester procedure Fil = 12.6
Mil TV-2b/U	12.6	FIL-Gr-Pl-Scr-Cath-Sup 7-8-5--A----3----2----0	Rang=50 Set=10	Pl/Scr=K Volts=250	30	P4	Set Scrn = 225V

OTHER RF POWER TETRODES

The 8122 is part of a series of RF Tetrodes, and one that could be adapted for use in HAM radio transceivers or amplifiers is the 8072. This tube is designed to operate at a lower plate voltage than the 8122. However, it requires a more elaborate thermal conduction cooling method than the simply finned 8122, which accounts for its lower price on the market.

8072

The 8072 is a conduction cooled ceramic and metal power tetrode designed for use in radio frequency power amplifier, oscillator and linear RF power amplifier service.

PLATE DISSIPATION	See Note
FREQUENCY FOR MAXIMUM RATINGS	500 MHz
COOLING	Conduction

CHARACTERISTICS

Cathode: Oxide-coated, unipotential		Base	11-pin
Heater:		Socket	Mycalex CP464-2
Voltage	13.5 volts	Max. Seal Temp.	250 °C
Current	1.3 amperes	Max. Anode Core Temp.	250 °C
Capacitances (Grounded Cathode):		Max. Height	2.26 inches
Input	16.0 pf	Max. Diameter	1.436 inches
Output	7.0 pf	Net Weight	2 ounces
Feed-Through	0.01 pf		

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Plate Voltage (volts)	Typical Operation: Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier and Oscillator	2200	0.300	See Note	8.0	—	700	175	0.30	1.2	110
AB	Linear Radio-Frequency Amplifier	2200	0.300	See Note	8.0	—	700	250	0.205	0.3	80

NOTE:
Maximum plate dissipation is limited by maximum anode core temperature which is dependent on the type of conduction cooling employed. With a suitable thermal conductor, such as berylium oxide, the thermal design should insure that for maximum expected anode dissipation, heat flow through the berylium oxide thermal conductor will be sufficient to dissipate that power with no more than 225°C at the interface between anode and berylium oxide.

I bought a NOS 8072 and tested it on my Hickok 800a at the same settings as the 8122. As I predicted, it gave a higher reading at the lower plate voltage applied by the 800a. Interestingly, it didn't heat up as quickly as the 8122.

Hickok 800a testing a new 8073