

accurate for our purposes. It does just what its name implies: it provides an indication of the number of electrons being emitted from the cathode. An emission tester is usually reliable, and can help you rank the quality of several tubes, as well as testing for shorts and opens.

When using a tube tester, stop the test and remove power at the first indication of a short. A tube with an inter-element short should not be used in an antique radio, not even just "to fill a hole." Watch the neon indicator on the tube tester for the slightest indication of leakage. If a hard-to-get tube tests "weak" (or worse, as long as it's not shorted) it can still be used "to fill a hole."

If you don't have a tube tester handy, you can make continuity tests with an ohmmeter, as we've discussed in previous columns; but such tests are limited. An ohmmeter can detect an open filament, but shorts may or may not show up on a cold tube.

### Testing tubes

The numbering system of antique radio tubes did little to identify the tubes' functions. Tubes were numbered consecutively, and unless you had an exceptional memory, it was always necessary to keep a tube-substitution guide handy. Later, even when tube numbers began to give some indication of type and function, every radio man kept his substitution guide within arm's reach because the sheer number of tubes made it a necessity.

For those who have forgotten, the numbers for tubes used in antique radios from the later 1930's give some information about the tube in the type number. The first digit(s) indicate the approximate filament voltage. The second part of the tube number consists of one or two letters. Usually, letters near the end of the alphabet (W, X, Y, Z) indicate a rectifier tube. An S as the first of two letters indicates that the tube doesn't have a grid cap, or that all elements are attached to pins in the base of the tube. The third part usually indicates the number of elements connected to the pins in the base of the tube. Of course, the number

TABLE 1-ANTIQUE TUBE SUBSTITUTION CHART

Tube	Sub	Tube	Sub
00A	01A	6F7	unknown
01A	00A 40	6G5	6U5
0Z4	0Y4	6J5	6C5
1V	6Z3	6J7	6K7
12	71A	6K5	6C5
24	35-51	6K7	6U7
26	unknown	6L5	6C5
27	56	6L6	6K6
32	34	6L7	unknown
33	1F4	6N6	6AB6
34	32	6Q7	6B6
36	39-44	6S7	6W7
37	76	6T7	6B6
38	unknown	6U7	6K7
39	44	6V6	6K6
40	01A-12	6X5	6W5
41	42	6Y5	unknown
42	41	6Z4	84
43	unknown	6Z5	unknown
44	39	7A5	7C5
45	2A3	7A7	7L7
47	unknown	7A8	unknown
55	2A6	7B5	7C5
56	27	7B7	7C7
57	58	7G7	1232
58	57	7J7	7S7
59	unknown	7L7	7A7
71A	unknown	7N7	7F7
75	85	7R7	7E7
76	37	7T7	7V7
77	1221	7V7	7C7
78	6D6	7Y4	unknown
80	5Z3-83	12SQ7	12SR7
83	5Z3	12SK7	12SG7
85	75	12SA7	12SY7
89	unknown	25A6	25B6
5W4	5Y3	25L6	25W6
5Y3	5AX4	25Y5	25Z5
5Y4	5Z4	25Z5	25Y5
5Z3	80	25Z6	35Z6
5Z4	5Y3	1232	7G7
6A7	unknown	6SA7	6SB7
6A8	6J8	6SC7	unknown
6B5	unknown	6SF7	6SV7
6B7	unknown	6SK7	6AG7
6C5	6C6	6A7**	6SA7
6D6	78	6Q7**	6SQ7
6D8	unknown	41**	6K6
6E7	6D7	42**	6F6
6F6	6V6	** = with adapter	

of elements does not necessarily correspond to the number of pins.

Letters at the end of the tube number refer to the type of construction. So, for example, a 25Z5 has a 25 volt filament, is a rectifier, and has five pins connected to tube elements. Earlier tubes (from the 1920's) have a two-letter prefix and three digits. Tubes with the UY prefix (like the UY224 or UY227) have five pins, and tubes with the UX prefix (like the UX226 and UX245) have four pins.

In Table 1 you'll see a tube-sub-

stitution guide; it is by no means complete, but does contain a list of the tubes I most commonly find in antique radios from before the second world war, along with common substitutes. You may want to clip the table and save it for future reference. Tube types marked with a double asterisk (\*\*) are functional equivalents, but their pinouts differ, so some type of adapter must be used. You could also rewire the socket.

### Reader's inquiries

Bill Fletcher (3302 Leopold Way, #111, Madison, Wis. 53713) writes looking for the schematic of the General TV And Audio model 337. Sorry Bill, I can't find that model listed anywhere, but maybe one of our readers can help. Martin Hammond (Box 1854, Huntsville, Ontario, Canada P0A 1K0) is interested in receiving information about antique radio museums and publications for collectors.

David Sharosky (1323 Jackie Lane, Mayfield Hts., Ohio 44124) has a crystal radio he'd like to sell; it has a label that says, "Martian Mfg. Co. Inc. Special, Newark, NJ Pat. Pend." Sounds interesting, Dave. If you weren't so far away I'd come and take a look at it myself. Dave also has a piece of galena he would like to sell.

David G. Weatherly (2300 Carolina Rd., Chesapeake, VA. 23322) wrote to say he has seven tubes from a Majestic model 90 for sale. Dave, if you still have the rest of that Majestic, it is as valuable as the tubes to someone needing parts.

A schematic for a Firestone Air Chief model 4-A-22, code 5-6-9023 B is needed by Michael Wilhelm (Marine Bks., Box MTM FBPO, Norfolk, VA 23593). Mike, I found some information on that radio in Sams *Photofact 11*.

Finally, one reader wrote complaining about a 1936 Silvertone 4585 console radio that whistled when new tubes were installed, especially when using the volume control. I'm sure others have had that problem; the solution is usually quite simple. Antique radios depend heavily on shielding for proper operation, so be sure to replace all shielding after working on an antique.

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