

## **Use of the RCA - 4652 /8042 in Mobile Equipment**

RCA's new 4652 Tube Type was designed for use in economical, high-performance, mobile applications. Its computer-determined electrode spacing and precision alignment deliver improved plate current, higher gm and a better knee line than its nearest competitor, the 8042. Manufactured in the U.S.A., the 4652 is made on the same production facilities, and with the same rigid quality controls that have led to the excellent acceptance of RCA's 6146 and 8072 families of mobile communication tubes.

Except in service where split-second response is absolutely necessary, the lower-cost 4652 matches or exceeds the 8042 performance in all requirements. While the 4652 takes slightly longer to reach 90 percent of full power output (3/4 second longer), its output power at the high frequency end of the band (173 MHz) is considerably better than the 8042's tested (60 W vs. 24 W).

It should be noted, however, that the 1.25-second warmup of the 4652 is a tube-only warmup time. In mobile radios employing more than one 4652 and/or 4652's intermixed with 8042's, the slowest system warmup time is still less than two seconds.

In other analyses, the 4652 matched or exceeded the performance of the 8042. Intermittent life testing, wherein both tube types were cycled one minute "on" and then four

minutes "off", showed better than 15,000 cycles life for both types.

The more rugged heater structure of the 4652, which causes the somewhat longer warmup time, does offer higher reliability. Actual field experience has shown the 4652 to be more reliable under continuous filament-on conditions. Life tests established the life expectancy under such conditions to be in excess of 1000 hours. A steady-state, filament volt-ampere characteristic test showed the 4652 to hold very closely to design center and to assure a well-balanced power distribution.

To prove the capability to withstand environmental conditions, both tube types were subjected to EIA-specified shock and vibration testing. No shorts were observed in either type during the test and the dynamic characteristics were unchanged. It can therefore be concluded that both tube types meet the EIA environmental specifications.

A review of these test results shows conclusively that the 4652 can be used effectively as a low-cost replacement for the 8042 and can be intermixed with it with no degradation in steady-state performance. Therefore, the 4652 should be recommended in all those cases where improved performance, reliability, and environmental capability is not overshadowed by a requirement for split-second response.