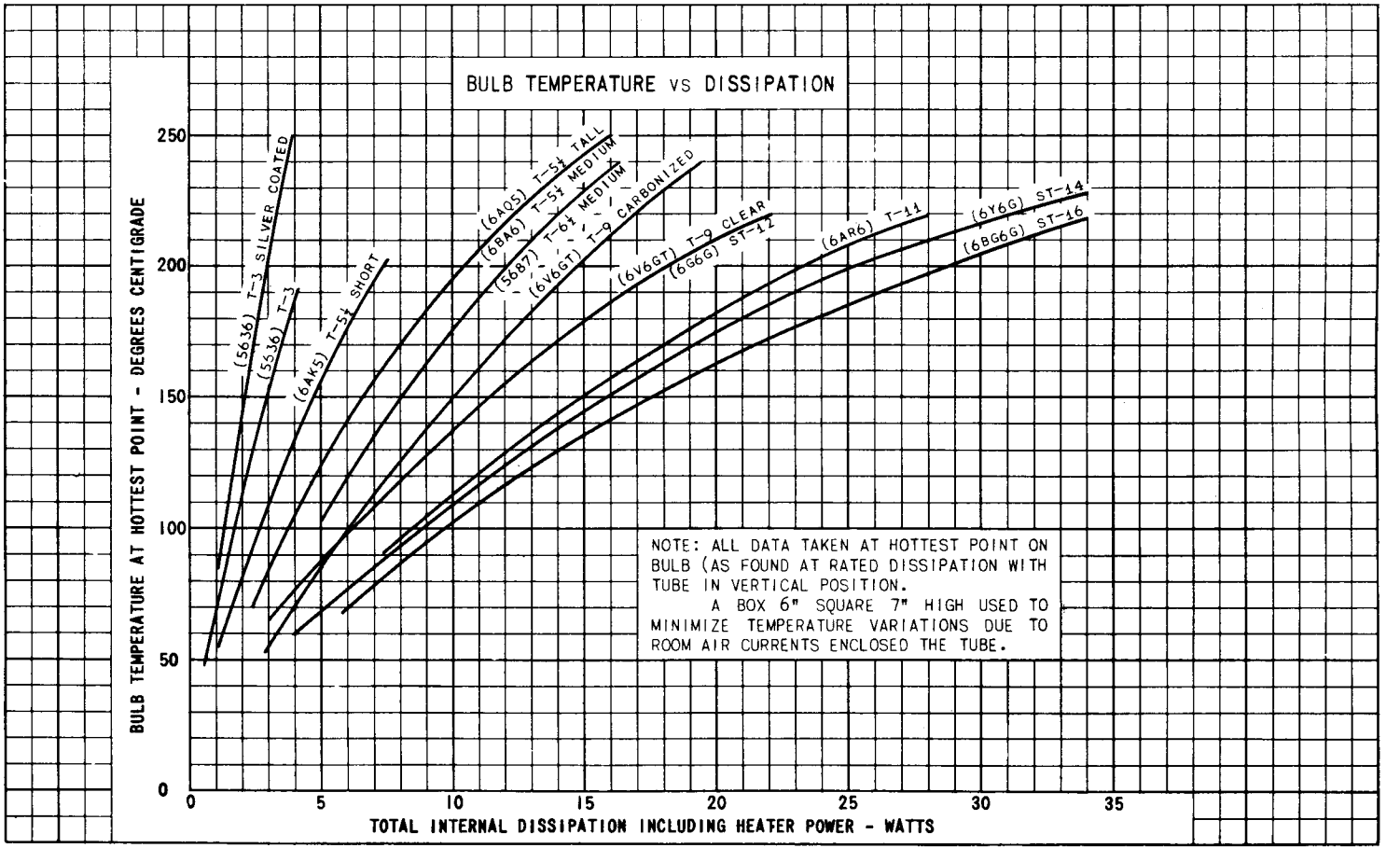
BULB TEMPERATURE CURVES

One of the most important factors affecting the useful life of electron tubes is the temperature at which certain parts are required to operate. In the past this has been controlled largely by electrode dissipation ratings. Recently a few, but now increasing number of tube types have been rated for the maximum allowable bulb temperature in addition to these dissipation ratings. The following curves relate the approximate "hot-spot" bulb temperature to the total dissipation (including heater power) for various sizes of bulbs under arbitrary reference conditions. Therefore, if the dissipation is known, these curves may be used to estimate whether or not the bulb temperature rating would be exceeded under such conditions. However, sufficient departure from these conditions would require actual temperature measurement.

The curves may also be used to find the approximate dissipation indirectly from bulb temperature when complex non-linear voltages and currents, such as are frequently encountered in radar, pulse and television service, make measurement by conventional direct methods very difficult if not impossible.

Data for the curves were taken by applying D.C. voltages to the indicated representative types in a 5" X 5" X 7" enclosure, and measuring the hottest bulb temperature with an iron-constantan thermocouple made of .003" wire. This "hot-spot" is usually found two-thirds to three-quarters of the way up the plate structure near the place where the plate is closest to the glass.

Any bulb temperature measurement should be made with a thermocouple that is made of very fine wire. In addition, great care must also be taken to minimize convection cooling, and to allow sufficient time to obtain a stable reading.



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