

ANNUAL INDEX-1951

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glass thickness of 5/16 in., and hence to the maximum diameter attempted. Shown in the photograph is a 16 in. tube with an aluminized magnesium fluoride screen; the flatness of the face plate is evident. The aluminum backing, among other things, prevents charging-up of the fluorescent screen and so facilitates plotting directly on the face plate. Actually, the face plate does have a slight curvature resulting from the tempering of the glass prior to sealing which is necessary to reduce breakage from mechanical and thermal shock during the sealing process itself. Spherometer measurements of the radii of curvature yielded values from 120 inches to 1500 inches, with a value of 200 inches being typical. For all practical purposes such a faceplate can be said to be flat.

The interplay of the factors mentioned in the discussion of the preceding section is apparent from the actual destruction pressure test data obtained and listed in Table II.

Flat face tubes of still larger size, 24 to 30 in. in diameter, would be desirable for radar presentations. In this case, the metal in the sealing area of the cone must be of greater thickness to increase the compressive force arising from the differential temperature contraction, which is seen to be approximately independent of tube size, in order to counteract the tensile stress in the face plate which is proportional to the square of the tube radius. To check the influence of thickness, 12 and 16-inch tubes having cone thicknesses of .020 in. less than those shown in the table were pressure tested. A strong de-

pendence of maximum pressure on the cone thickness was indicated; such tubes failed at pressures about 50% of values for thicker cones.

The glass thickness must also be increased to provide the desired strength. Using the value of breaking strength computed from the equation for tensile stress, already quoted, and the pressure test value for the 16 in. tube, the face plate thickness required by a flat face tube to yield at least a 40 lb. pressure test is shown in Table III.

TV Planning Book

Facilities and function of equipment used in a well-integrated TV station are described in "Station Planning," a booklet published by Allen B. Du Mont Laboratories, Television Transmitter Div., Dept. TH, 1000 Main Ave., Clifton, N. J.

