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GAS DISCHARGE PANEL DISPLAYS

tical filter to block the light from the neon glow. Custom 256-character panels have been built using a green phosphor, and these show little, if any deterioration with life. Experimental panels which exhibit two colours in each display cavity, selectable by choice, have also been constructed.

Under normal conditions, the DC gas discharge display operates in the bistable mode, i.e. the display dots are either on or off. However, recent advances in drive and digital modulation technology have shown the feasibility of generating variable intensity displays to produce television pictures. Fully populated experimental display panels of a size equivalent to the 256-character device (discussed later in the article) have exhibited a 100:1 grey scale. This is considerably better than for most CRT systems.

Factors inherent in both the concept and construction of self-scan panel displays contribute to their superior legibility as compared to a CRT. The fixed dot matrix format ensures that the displayed characters remain geometrically consistent over the entire display area. There is no visual distortion at the edges, which can occur in all but the most costly CRT systems, resolution is uniform over the entire area, and each display dot has a precise boundary formed by the wall of each display cavity in the light-opaque cell sheet. This ensures that display characters are sharply delineated. In addition, the rigid construction of the dot matrix keeps characters in fixed positions, and there is no wavering or position change due to outside influences such as line voltage variation or ambient electromagnetic radiation.

One of the main advantages of gas discharge display panels is that they may be incorporated into equipment areas where CRT installation would be quite difficult or even impossible. Because the display panel is flat (usually less than 6cm thick), it can be placed conveniently near

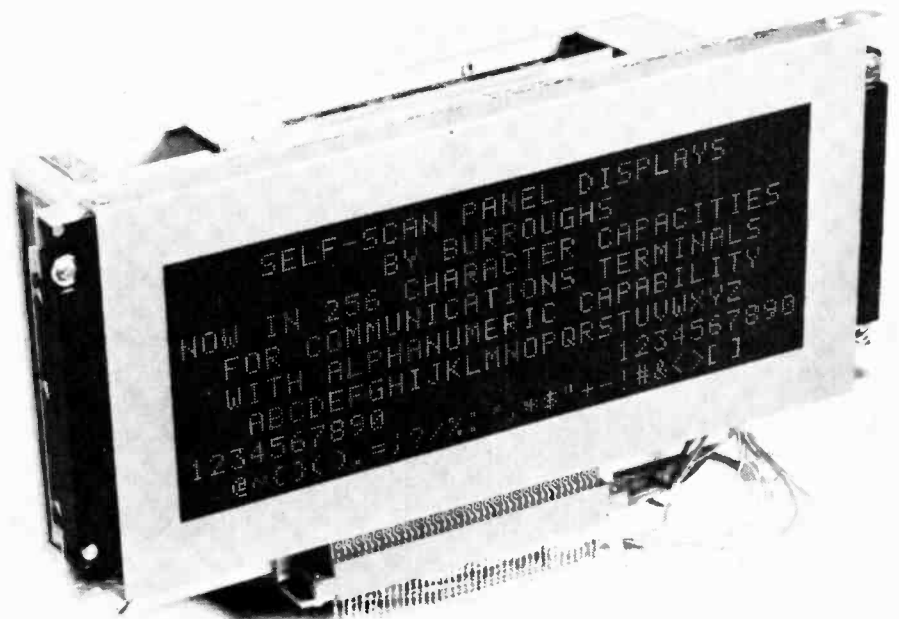
the viewer or near any controls the viewer might need to operate. In addition, the compact nature of these devices enables several discrete displays to be mounted in a console, or in equipment racks in areas where space is severely limited. This aspect of flexibility cannot be approached by CRTs.

Gas discharge display panels also offer a significant safety factor advantage when compared to CRTs. Since the panel contains only a few cubic centimetres of inert gas at approximately one-fifth atmospheric pressure, and since its structure consists of a rugged sandwich of densely packed internal parts, there is no risk of implosion as can occur with a CRT with its comparatively large internal vacuum. And unlike CRTs, there are no dangerously high voltages involved in driving the gas discharge panel display. The maximum voltages involved are between 250 and 300V DC and, since the panel is totally enclosed, there is no danger of making contact with these potentials.

Other advantages of gas discharge display panels over CRTs include greater life expectancy, no maintenance requirements, more rugged construction, and lower power supply requirements.

So much then for the advantages gas discharge display panels have to offer. What about their disadvantages as compared to CRTs? For a start, CRTs have a higher light output, a higher addressing rate, and are capable of higher resolution. Other main advantages of CRT devices include a higher data density capability, and the ability to be interacted with by means of a light pen.

Let's now examine some of the applications of gas discharge display panels, with emphasis on the Burroughs Self-Scan range, and take a look at what's currently available. As could be expected, these devices have a wide range of applications such as in calculators, digital clocks,



Above, the Burroughs BDS40832-200 256-position display subsystem. The panel comes complete with all the necessary electronics, including the drivers, memory, timing and character generation circuitry.