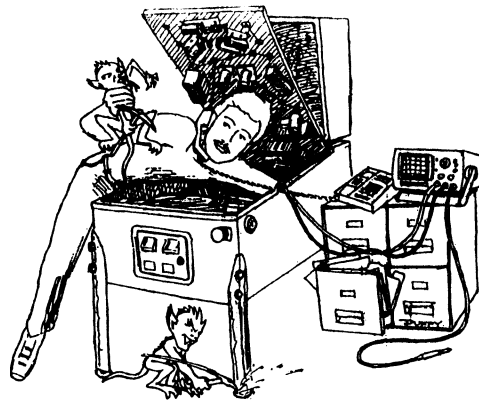




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## Technical Support

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TO: Service Managers

FROM: Joe Blackwell, Technical Support Manager

DATE: November 16, 1993

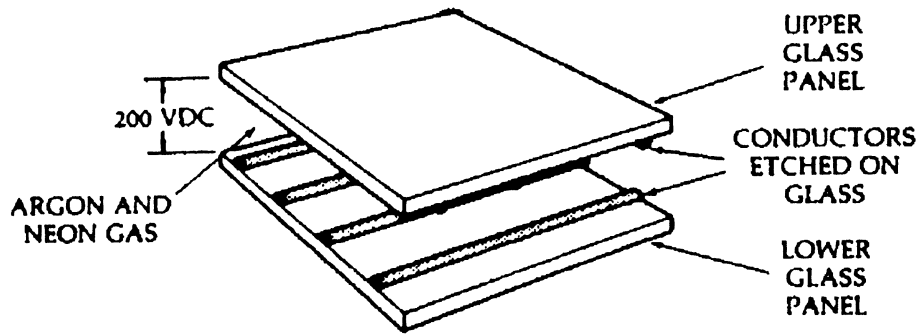
RE: F.Y.I. -- Dot Matrix Display Glass -Theory of Operation

### Gas Plasma Displays

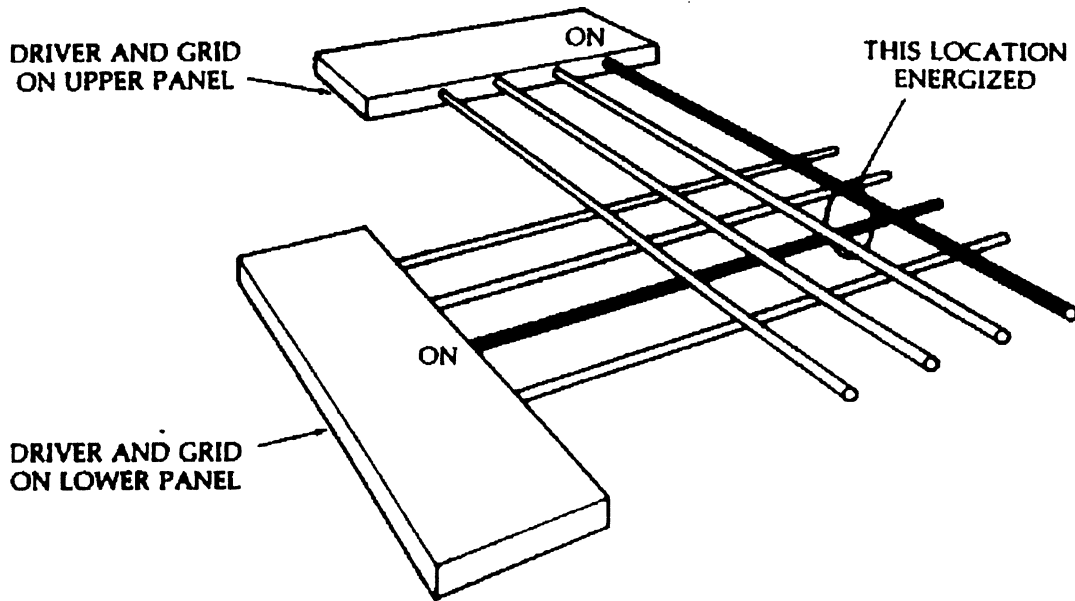
Fig. 1 illustrates the operating principle of a *gas plasma display*. A mixture of argon and neon gasses is sandwiched between two glass plates, as shown in **Fig. 1A**. A pattern of conductors is etched on the inside of each glass plate. **Fig. 1B** illustrates how a particular location on the display is turned on. One conductor on the upper panel is energized, and another conductor on the lower panel is energized. At the point where the two conductors cross, the gas is broken down or "ionized." The voltage difference between the two conductors is about 200-V DC, and this is enough to strip away some of the electrons from the gas molecules. These free electrons are able to carry an electrical current from one conductor to the other, and this current causes the gas to glow. A gas plasma display is usually controlled by row and column driver IC's.

Gas plasma displays tend to be quite reliable. One type of display lists a "Mean Time Before Failure" of 30,000 hours of operation. This works out to about 3 year's of continuous operation! But, if the glass panels are cracked, the gas will leak out and the display will have to be replaced.

On occasion, a display will have a few locations which do not work. Sometimes, a whole row or column of locations will stop working. This points to a problem with either the driver IC, or with the latch or amp for the affected row or column.



(A) Panel construction.



(B) Grid drivers.

**Fig. 1 Gas plasma display.**