

# Evolution or revolution?

The future looks bright for liquid crystal displays for avionics

Lawrence E. Tannas, Jr

The aircraft is experiencing the greatest quantum change since the introduction of the jet engine. But many observers do not see it in such terms because the changes are so conservative that they appear more Darwinian than revolutionary; they are in the flight deck and not in the performance envelope, and they are not yet complete.

The changes referred to are the infusion of microelectronics into the flight deck and the resulting applications such as GPS navigation, satellite communications, real-time weather and weather maps, real-time traffic, advisories, and electronic maps and plates. The single display with integrated navigation, weather, traffic and terrain is the Holy Grail for pilot situation awareness. It is coming, and the benefits are lower cost of ownership and improved flight safety.

Changes are not complete yet because of the limited availability of the cornerstone component – the liquid crystal display (LCD). Further it is not clear how best to integrate the situational issues of navigation, terrain, traffic and weather. Should the image be inside out or outside in; horizontal, perspective or vertical; display head up, head down or helmet mounted; color or monochrome; stereo or non-stereo, etc? Regardless, everyone will agree that the navigation situation is instantly apparent after seeing the present position relative to desired flight path and navigational checkpoints on a horizontal situation display. Add traffic, weather and terrain and you are in pilot heaven.

The LCD is the display of choice and is widely used on the flight deck – but only at the high end of aviation in airlines, business jets and military aircraft. Most of the more than 200,000 aircraft worldwide have not seen an LCD except perhaps in a new GPS box.

The barrier to the LCD has been availability in the size needed at an acceptable price. Military aircraft pilots get the best at whatever the cost, but even that has its limits as the industry

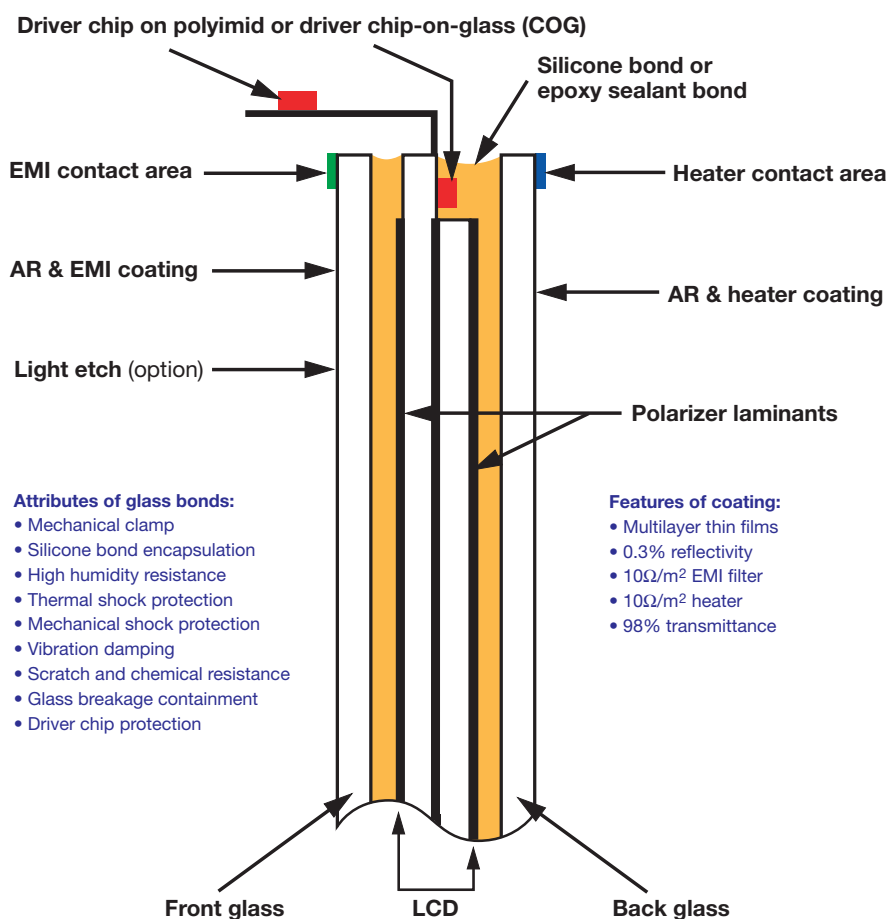


Figure1: Ruggedized avionics LCD sandwich