

Tek in the cockpit: new CRTs ease pilot's workload

A quiet revolution is taking place in a future aircraft cockpit design, and Tektronix will play a big role in the changes. The "glass cockpit" is not fragile like the proverbial "glass house." Glass going into these new cockpits can withstand up to 20G's of shock. What is it? It's the new color CRT's being designed and built by Tek Avionics Displays.

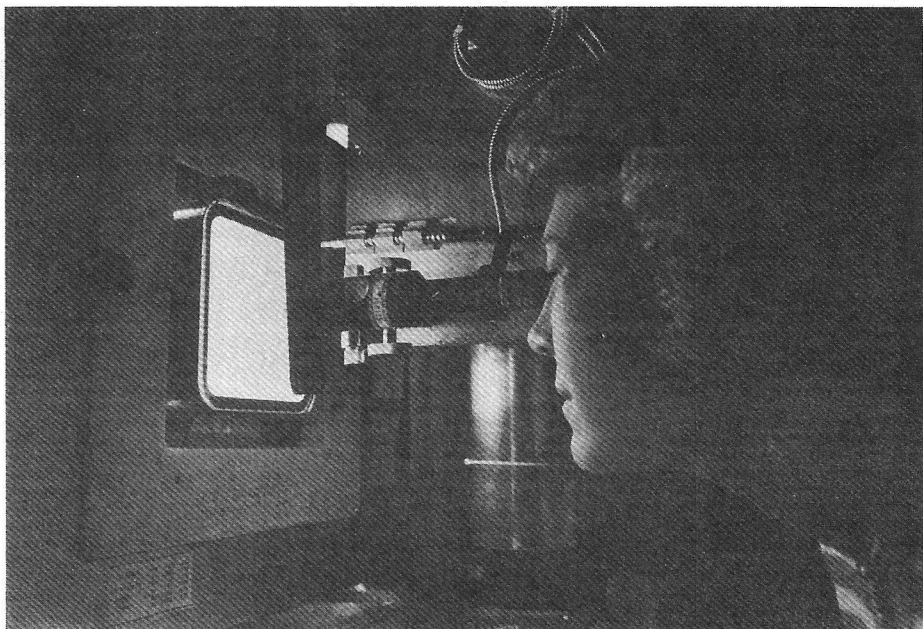
Tek began working on technology for a special military display in 1980, at the request of Sperry Flight Systems. Sperry was then designing an Electronic Flight Instrumentation System (EFIS) for the U.S. Air Force F-15 jet fighter.

A consortium of avionics companies later contracted with Tek to build a similar in-line gun, color avionics tube, and a special project unit (SPU) was formed in 1983 to develop the product line.

The program would prove to be a genuine engineering design challenge. Avionics people also discovered that they had their work cut out for them in marketing into the specialized military avionics market.

It's a success story, though, with Tek avionics tubes currently "designed-into" existing and future military aircraft: the FV-15 Eagle, the F-18 Hornet, the GR5 British Harrier Vertical Takeoff and Landing (VTOL) aircraft, the AV8B American Harrier VTOL, the C-17 wide-body transport, and the Navy's newest multipurpose aircraft, the V-22 Osprey, a futuristic tilt-wing VTOL.

"We know that the CRTs are also being designed into highly classified 'black' programs," says Jack Newcomb, Avionics marketing manager. The other part of the success story is that Avionics is shipping at a good clip, "due in no small part to our



THE TRAINED EYE OF Gayle Apilada is focused on the CRT at an optical inspection station.

will generate," says Jack. "It makes more sense now for us to pursue the military market."

The Avionics CRT, however, can't be beat for its 'pretty picture.' It's a high-resolution, daylight-bright color CRT, four of which will form the heart of a super-sophisticated human interface in the new V-22 aircraft. Almost all information needed by the crew is presented as computer-generated displays. It will make obsolete the old 'cockpit-full-of-dials' in most aircraft today.

Says Fred Engstrom, Avionics Displays general manager since the business was formed in 1983: "We had a new product in an unfamiliar market; difficult conditions under which to start a new business." The key to success, says Fred, is people. "Tremendous dedication was required. Everyone had to feel that they had lots of 'ownership' in the business." Fred made sure that all the latest information about the business was made available to everyone at all times; people involvement was the watchword.

For maximum productivity, wide-ranging responsibilities were given early-on to the 35 or so people currently within Avionics Displays.

Jack Newcomb's "territory" is essentially the whole world; he has spent time in France, Germany, England, and Scotland, all within the past year. "India, China and Japan are also potential

market areas," says Fred.

Fred has had much industry exposure in the high-technology military market, helping RCA develop complex vidicon tubes for the Air Force. A graduate in engineering physics from Cornell, Fred started with Tektronix in 1973 as a project engineer investigating what was then futuristic electro-optic designs.

The engineering challenges for Avionics were to design a CRT with very high resolution and very high brightness—typically mutually exclusive features. But engineers accomplished the impossible through an innovative, "taut" shadowmask design. The patented design eliminates thermal distortion, providing very high color purity in addition to withstanding high shock and vibration.

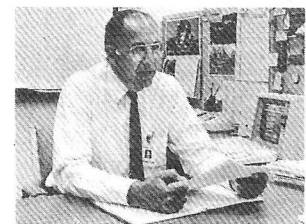
Marketing had to become "excellent" also. Tek was not only selling into a new and specialized market, but to an OEM market as well. Selling required that Avionics learn a whole new protocol. They've also been learning how to get closer to the customer. Jack Newcomb and others in Avionics spend a lot of time building customer confidence. Jack says it's easier when you know you have the best product.

Another issue Tek must deal with when selling high-technology, defense-sensitive components to foreign nations is the trick world of export policy. "We must be able to alleviate foreign customers' fears that

their sources of supply may disappear due to political changes. This means being able to anticipate those things—not always an easy thing to do," Jack said.

Jack, an old pro in defense contract marketing, learned the ropes while working for General Electric, and most recently, FLIR Systems of Lake Oswego. He's now putting his 20 years' experience on the line, helping Avionics enjoy its first profitable year.

—Bill Peterson



MARKETING MGR. Jack Newcomb

'manufacturing excellence' goals," Jack says.

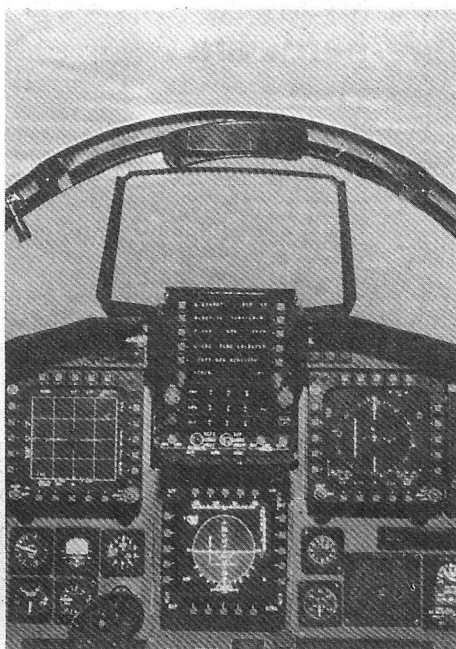
The CRTs, at \$6,000-\$10,000 each, and are custom-designed in terms of mounting and magnetics, for specific military requirements.

Jack predicts that the Tek tube may find its way into tactical ground vehicles as well, but don't look for them in the new car you buy a few years from now; here, lower-cost technology will hold sway.

"Entrance to the commercial marketplace would require much more volume than our high-technology tubes



Terri Johnson, Fred Engstrom and Steve Dutcher.



F-15 has total of seven Tek CRTs; three are shown here.