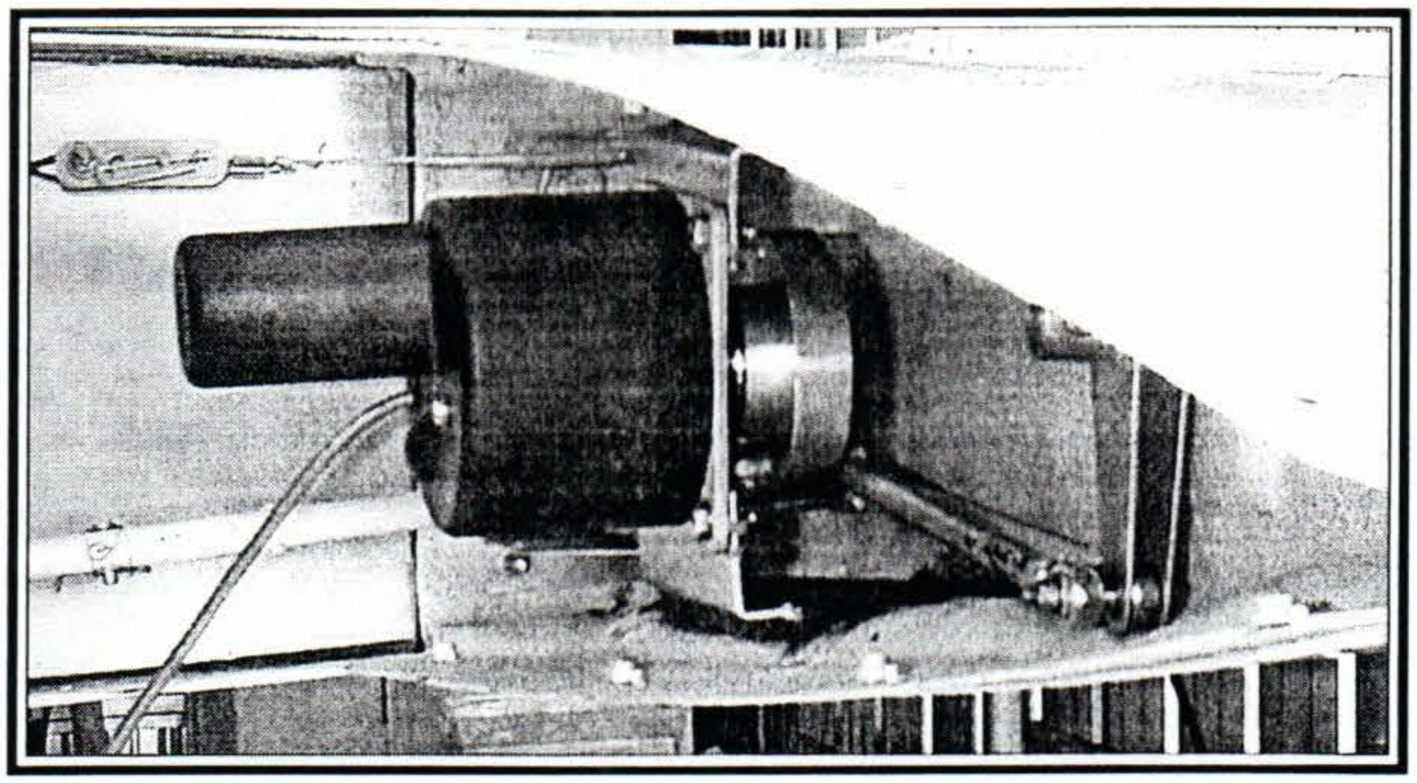
Installation of an S-Tec System 30 in a Cozy Mark IV

Ed Richards *(FL)* - I think most pilots would agree that having an autopilot is a real asset to flying cross-country, particularly in the IFR environment. I was convinced that I wanted a two-axis (pitch and roll) system, although nothing too sophisticated. I selected the S-Tec System Thirty as it fit performance and space requirements. One of the really attractive aspects of this unit was that it fit in place of the standard turn coordinator with only a few additional switches to be mounted on the panel or the stick. It should be noted that the S-Tec unit provides a standard turn coordinator as part of the roll computer so the instrument is not lost when replacing the turn coordinator.

The first step was to purchase the unit. S-Tec was very "up-front" advising that this would not be plug-and-play. The closest documented installation to the Cozy is a Long-EZ and S-Tec and I both agreed that this should get me pretty close. Again they cautioned not to be surprised if this installation required additional tweaking beyond the Long-EZ. I was confident that it would be "no problem".

At Sun n' Fun 2001, I purchased the system from Gulf Coast as S-Tec only sells through their distributors. The unit arrived, as promised about 4 weeks later, with all component parts and very good documentation. The only thing missing seemed to be all the mating connectors. How am I supposed to wire this thing without the connectors? I called Gulf Coast; it was a waste of time. They only sell the unit; you need to call S-Tec I was told. S-Tec informed me that a wiring harness is provided with the unit. All I needed to do was give them the branch lengths and they'd build the harness. That all worked out pretty well. I was very conservative on the "un" lengths so I probably have more wire than I need, but none were too short. In reality I actually estimated all the lengths for the harness so it could be made while I was installing the servo drives.



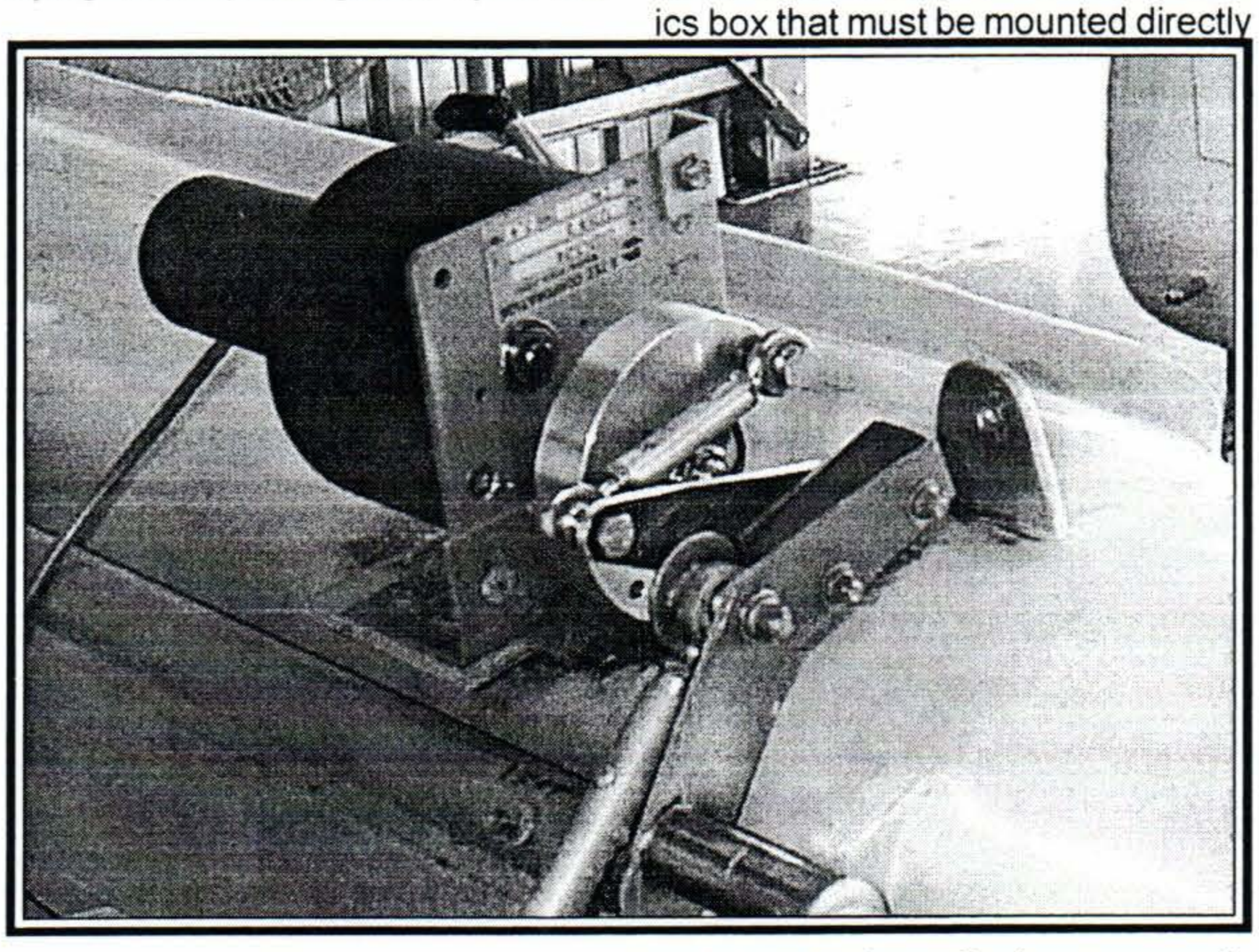
roll servo installed in right wing root

The installation drawings call for the roll control servo to be mounted in the right wing root with a push rod connected to the aileron bell crank. The installation worked out almost exactly per the Long-EZ drawings provided.

The pitch servo installation required a bit of engineering to adapt it to the Cozy elevator arrangement. The bracket provided by S-Tec was to be pop riveted to the elevator torque tube and the servo mounted to F-22. There were two problems with this. One, the bracket for the torque tube didn't fit properly (wrong radius). And two, mounting to F-22 was not only going to be difficult to do but would make removal of the Canard a real pain. So I reconstructed the linkage with the servo mounted directly to the canard, trying to keep the geometry of the servo basically the same. With this arrangement all that is required to disconnect the autopilot when removing the canard is to unplug the servo.

The linkage is constructed such that the elevator is controlled from the servo push rod via a custom crafted bracket, which is attached to the opposite side of the balance weights on the left CZNC-12A control arm. The only additional modification was to shorten the push rod as supplied by S-Tec. Again, I was careful to try to preserve the geometry of the servo system keeping the arm lengths the same and positioning neutral elevator near top-dead-center of the servo crank.

The other items to install were the pitch computer, which is a small electronics box that must be mounted directly



pitch servo installed on canard

planes and talked to more EZ drivers. I saw Steve Wright, who said he'd sold 75 of those EFIS ONE units that week. They are taking the world by storm, it appears.

I went to a couple forums and left for home at noon Thursday. I drove straight through again and got home at 6:30 AM Friday morning. The weather was still rotten. I drove through about 200 miles of less than 400' and a mile with very heavy rain for about 100 miles.

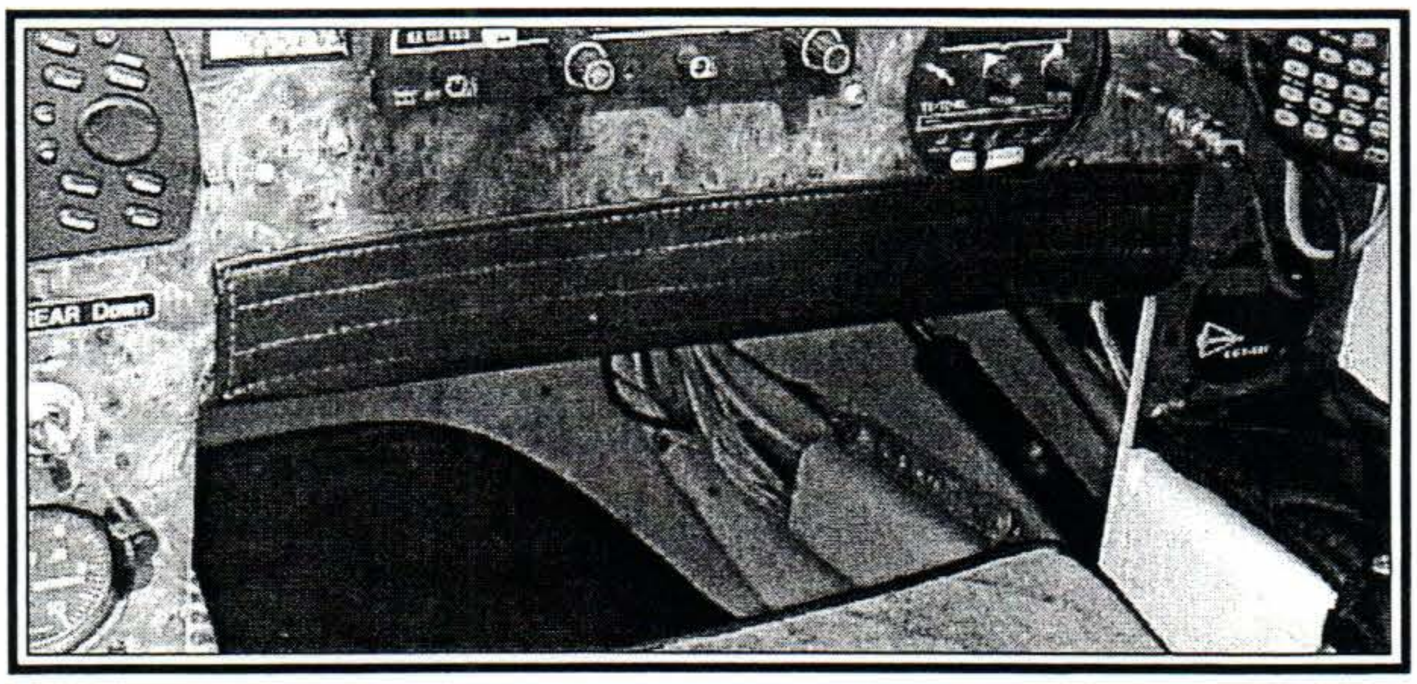
The best part of the fly-in was visiting with the people. I guess that is the same at all these fly-ins.

The vendors had the usual stuff with some interesting exceptions. UMA (800-842-5578) has a new electroluminescence light bezel for individual instruments. It replaces protruding post lights and offers a very nice bulbless illumination. It makes the instrument appear to be internally lighted.

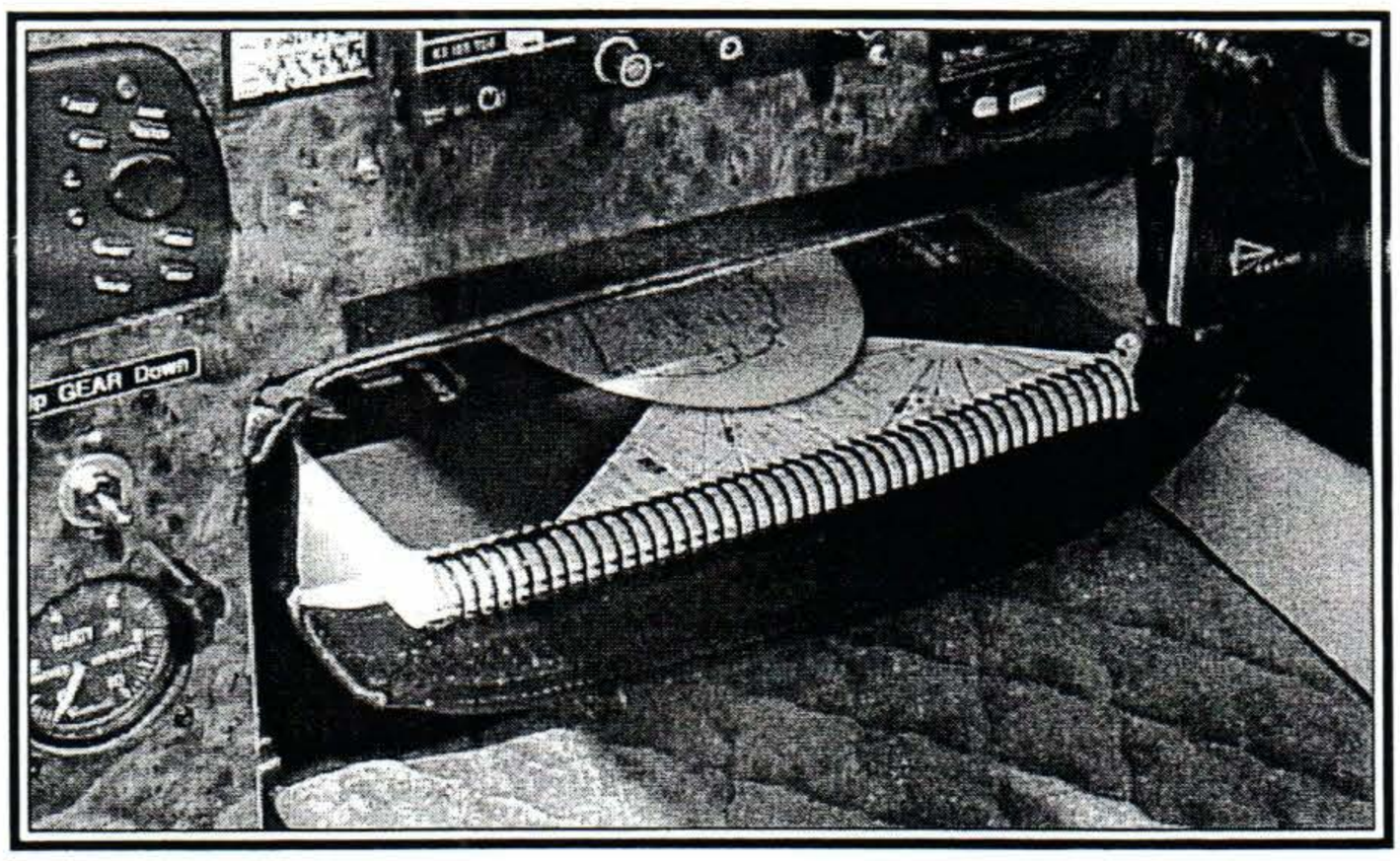
The ¼" thick unit fits between the panel and the instrument. It is available in white, green or red and 2-1/4 and 3-1/8 instrument sizes. A $35 required DC to AC inverter powers up to twelve gages which cost about $40 each.

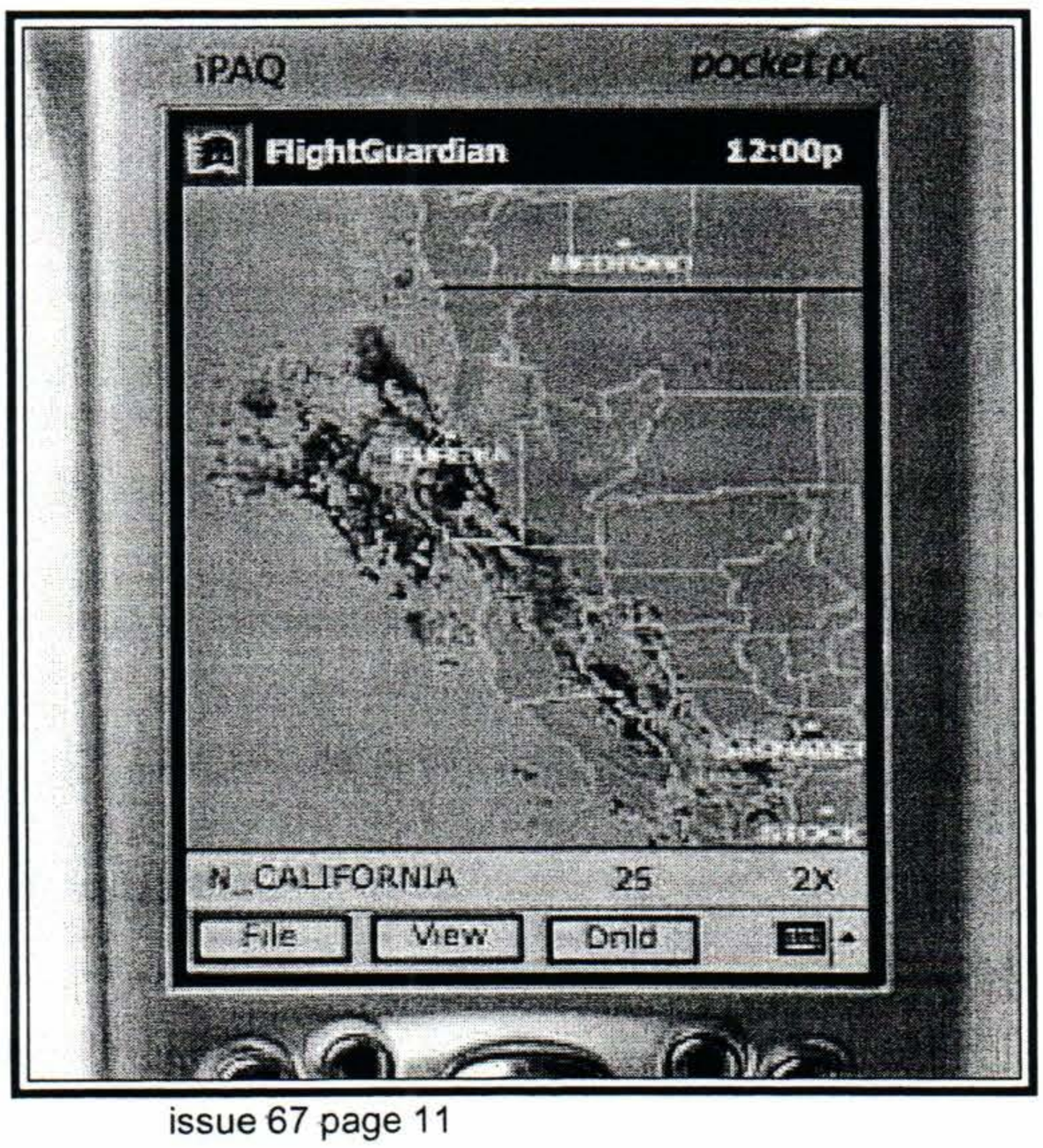
Quiet Technologies (866-784-3883 or quiettechnologies.com) has an interesting "insert" headset. It fits into the ears with replaceable elastomeric foam tips. Its 1-1/2 ounce weight makes it seem an interesting alternative to the heavier headsets. It is claimed to be as quiet as the ANR headsets (25-35 dB reduction). If your GIB resists 5-hour legs with headsets that crush hair and skulls, perhaps this $325 investment will be worth looking into.

AirCell (888-328-0200 or aircell.com) and Control Vision have united to deliver NEXRAD weather images to your cockpit. Images can be uploaded to PDA, EFB or MFD displays. Anywhere Wx and Flight Guardian can provide NEXRAD weather images to 2 km of resolution in typically less than one minute. The new system is pres-



Tim Freeze's MK-IV has a neat map pocket that closes for passenger entry and then opens in Wendy's lap





Some day you may have this in your airplane.