AOPASWEEPSTAKES

Black box bonuses

A 1960s light twin gets a thoroughly modern panel

BY THOMAS A. HORNE

OPA's Win-A-Twin Comanche may be 39 years old, but its new instrument panel is definitely up-to-date in almost every regard. Our goal in this project was to obtain the most advanced avionics we

could arrange, but at the same time stick with proven boxes that didn't require any fancy field approvals, first-time certifications, or other special blessings from the FAA. All that bureaucracy would slow the project way down and affect other work.

GPS and MFD

The heart of the panel is the Garmin AT package. This consists of a GNS 480 (formerly called the CNX 80) GPS/VHF navigation receiver/communications radio, all rolled into one box. Though the GNS 480 has a provision for transponder con-

trols, our transponder—a Garmin GTX 330, with traffic reporting capability—operates independently. It's over on the left side of the panel, just above your left knee.

We picked the GNS 480 not just for its advanced features, but because it has the capability of flying WAAS (Wide-Area Augmentation System) instrument approaches. WAAS uses a network of ground stations to make GPS signals five times more accurate than those used in non-WAAS-approved GPS receivers. All this accuracy means that the lucky Win-A-Twin



winner will be able to shoot more approaches to more airports, to lower instrument approach minimums than those authorized by more traditional ground-based, nonprecision approach navaids and by existing non-WAAS GPS approaches.

Newcomers to the GNS 480 are often baffled by it. And it does seem unncessarily convoluted in its operations at first. But as with any new black box these days, training and familiarization make the awkwardness, procedural dead-ends, and discomfort go away. It's all a matter of gaining hands-on proficiency and laying down the proper psychomotor conditioning.

Books could be written about the GNS 480's ins and outs, so a complete discussion of its capabilities is way outside the scope of this article. But what stands out most about the GNS 480 is its heavy emphasis on the flight plan functions. This is called up by pressing the "FPL" soft key along the bottom of the display screen. You enter a departure airport, then a destination airport (then an alternate, if instrument flight rules dictate), and then begin filling in

the route between the two.

This is quite easy, once you get the hang of it. Soft keys on the right side of the screen let you pick waypoints or airways along your route. Select them, hit the Enter key, then

AOPASWEEPSTAKES

hit the EXEC key to execute the flight plan and make it active. It's all designed to work in tandem with the way air traffic control clearances are delivered. For example, let's say you're cleared to fly to Fix A, then take Victor 123 to LUCKY Intersection, then direct to the destination airport. You enter the fix as a waypoint. You'll see an "Airway" soft key on the right of the screen, which lists the airways running through Fix A. Press the key with V123 on it, rotate the knob on the lower right until LUCKY shows up on the top of the screen, press Enter, and you're done. You don't have to enter each VOR or intersection along V123—it's entered automatically. This makes the GNS 480 much more convenient than, say, systems that require you to enter each and every waypoint along your route.

When it's time for an approach or departure procedure, other soft keys list them, and they also are activated with the Enter key.



Your route shows up on the GNS 480's display screen, and the Garmin AT MX20 multifunction display (MFD) also. The high-resolution MX20 can be set up to show low- and high-altitude instrument en route charts, can be loaded with Jeppesen's JeppView instrument approach and departure charts, and also can show VFR charting symbology. This includes an elementary terrain-warning feature in that any terrain at or above your altitude appears in red.

But the best part of the MX20 is the WSI InFlight datalink weather information, delivered by a satellite-broadcast feed. WSI's Nexrad radar imagery can be called up on the MFD, as can METARs, TAFs, and other text weather. You still should talk with flight watch, but a picture's worth a thousand words, and the WSI information gives you some great visual insight. I especially like seeing the cloud-height information for thunderstorm returns and the direction of cell movement. By panning the view, you can see radar returns farther along your route-or anywhere in the United States, for that matter. And WSI's update rate is quick. The oldest images I've seen were uploaded just four minutes in the past.

We opted to stick with datalink weather alone, so there's no lightning detection system aboard N204WT. The feeling was that the datalinked Nexrad imagery served as a worthy substitute. If the winner wants lightning detection, there's some panel space left for this purpose.

Autopilot

Our/your autopilot is a Meggitt/S-Tec System Fifty Five X. It has heading, nav tracking, approach tracking, altitudehold, and vertical-speed modes, but its best feature is GPSS roll steering. Push the NAV button twice, and roll steering kicks in. Now the airplane will track the flight-planned route based on the GNS 480's inputs, right down to automatically making any course changes. And get this: It even flies holding patterns.

That feature alone makes the Fifty Five X a great choice, but the vertical

The heart of the Win-A-Twin's panel is Garmin AT's GNS 480 GPS/nav/com (bottom) and MX20 multifunction display (above). The MX20 can be set up to show a split screen. This setup shows terrain and airspace on the left side, and graphical METARs on the right. A GPS approach path is plotted on both screens. IFR charts are also available on the MX20. speed mode is another great convenience. Push the VS button, dial a knob up or down to the descent or climb rate you want—say, 500 fpm—and the airplane trims for the new pitch attitude. You still have to manage power and airspeed, and remember to hit ALT to level off at the new altitude, but even in a high-workload environment this is a very small price to pay.

EHSI

Honeywell Bendix/King's KI 825 is the Win-A-Twin's electronic horizontal situation indicator (EHSI). With its slaved compass system, three views (HSI, Full, and Arc), course overlay, and zoomable scales, this high-resolution unit works with the GNS 480 and Fifty Five X to display course, groundspeed, time en route, and other information. Easily visible in direct sunlight, the KI 825 will spoil you from the moment you fire it up. Your course line appears on full-screen and arc viewing modes, along with the fix names and fix symbols. Across the bottom of the display is lateral course deviation symbology. And when flying ILS, VOR, or localizer approaches, lateral and vertical guidance commands also are provided by the KI-825.

Transponder

The Garmin GTX 330 serves as a Mode S transponder and more. Via groundbased datalink, it picks up ATC approach radar information and calculates any nearby traffic threats. When a target gets within five miles of your position, the MX20 automatically calls up a dedicated traffic display that shows the relative bearing and altitude of any close-in, Mode C-equipped aircraft. It even sounds an aural warning.

VHF nav/com

Navigation redundancy comes via the Garmin AT SL30 nav/com. Paired with a number-two course deviation indicator (CDI) with glideslope, this unit can let you fly Victor airways the old-fashioned way, as well as shoot VOR, localizer, and ILS approaches. A flip-flop switch lets you toggle between nav and com frequencies; just make sure you're in the desired mode when toggling.

One nice SL30 feature is the monitor mode. When there's a pause while listening to one com frequency, you can monitor another at the same time. This comes in handy when listening for ATIS, AWOS, or ASOS information while staying on an assigned voice frequency.



The Meggitt/S-Tec autopilot, with GPSS engaged (top); Honeywell Bendix/ King's KI 825 EHSI, in Full display mode, showing course lines, fixes, distance to waypoint. groundspeed, desired track, and CDI information (center). The bottom photo shows the JP Instruments EDM-760 (left), with vertical bars depicting CHTs and EGTs, and displaying the number of gallons consumed by each engine. **Mid-Continent's** standby attitude indicator (bottom right) is electrically powered.





AOPASWEEPSTAKES

Come to think of it, the GNS 480's com radio has this function also—along with the ability to recall and enter the past 10 com frequencies you used.

Engine and fuel monitoring

You can get a complete rundown on the Win-A-Twin's two Lycoming IO-320s via the JP Instruments EDM-760, mounted right next to the altimeter. Exhaust gas temperatures (EGTs), cylinder head temperatures (CHTs), oil temperatures, battery voltage, and much, much more is presented on the EDM-760. It also can warn of cylinder shock cooling, and an imbalance in EGTs. When it comes to leaning the engines' mixtures, determining leanof-peak EGTs is a snap: Just press the right button and the EDM-760 begins looking for a cylinder to hit peak. When it does, that cylinder's vertical bar gauge begins flashing. Now you can go rich or lean of peak EGT by moving the mixture lever and watching the EGT value drop by the desired amount.



An aircraft loan from Union Planters Bank is the fastest way to take to the skies. Our lenders make it easy to apply, and they offer quick turnaround times – with credit approval in as little as 24 hours and closing in three to five days. When you're ready to get your dreams off the ground, call our aircraft lending specialist at 1-866-459-3919. www.flyupbank.com

AUNION PLANTERS BANK

ENDER All loans subject to credit approval. © Copyright 2002 Union Planters Bank. Member FDIC.

The EDM-760 is also a fuel monitor. In this mode, the unit can display any number of critical fuel-related variables. These include fuel flow per engine, total fuel consumed, fuel consumed per engine, total fuel remaining, and endurance. Fuel information also is sent over to the GNS 480, where it can be displayed on the customizeable fields on the second, third, and fourth navigation pages. My preference is to put "Fuel to destination" and "Fuel remaining at destination" on the third and fourth pages, giving me a quick howgozit on my fuel situation on long cross-country flights.

Entertainment

Topping off this already-loaded panel are PS Engineering's contributions to the Win-A-Twin. This includes its PMA 8000 audio selector panel, with its IntelliVox automatic intercom squelch control and dual independent music inputs. There's also a provision for a dedicated cellular telephone interface, though a cellular telephone is one of the few extras not included in N204WT's equipment list.

The PMA8000 does everything you'd expect of a full-featured audio panel and then some. Here's where PS Engineering's PAV80 in-flight entertainment system comes into play. The PAV80 is a combination AM/FM radio receiver, CD player, DVD player, and MP3 player all rolled into one.



AOPA PILOT • 124 • OCTOBER 2004

The PAV80 lets front-seaters listen to radio stations while rear-seat passengers can watch movies sent from the DVD player. There's a small remote-control unit that lets CD/DVD listeners/watchers fast-forward or reverse through scenes, or select music tracks. The viewing screens—Audiovox high-resolution, 5.5-inch liquid crystal displays—are mounted in the front-seat headrests.

With this setup, the pilot can have intercom conversations, talk to ATC (other audio inputs are muted whenever there's an ATC or pilot radio transmission), and listen to the radio while passengers watch movies—all at the same time. Team the PAV80 with the Bose X active noise reduction (ANR) headsets that come with the airplane and you've got top-notch quality all around. That's about as full-featured as audio/video systems come in light GA aircraft.

As you can see, we cut no corners with the Win-A-Twin's panel. There's even a Mid-Continent Instruments "Lifesaver" standby electric attitude indicator with its own built-in battery. It comes on line if the airplane suffers a total loss of electrical power. This is signaled by the unit's flashing warning light—your cue to press a button that will activate the gyro's internal battery. With attitude and navigation redundancies, plus near-real-

PS Engineering's PAV80 entertainment system lets back-seaters watch DVDs while others listen to the radio, or CDs.

ATDIOVO

FOR PILOT VIEW

time weather and traffic information, plus terrain information, plus autoflight, we've built a panel that keeps you fully informed and safe as can be in a modern light twin. The PAV80 is icing on the cake.

While the units we've reviewed here may seem complicated, we've anticipated the learning curves. Avionics training in the use of the GNS 480, MX20, and Fifty Five X will be provided by Avionics Training Unlimited, Inc., a firm based at Collegeville, Pennsylvania's Perkiomen Valley Airport that specializes in handson advanced avionics education. The company's two-day course should bring you up to speed with minimal fuss.

So after you've taken delivery, taken the training, and are enjoying your

Links to additional information about the Win-A-Twin Sweepstakes may be found on AOPA Online (www.aopa.org/ pilot/links.shtml). Keyword search: Win-A-Twin flights in N204WT, don't blame us if you become lost, er, temporarily uncertain as to quality of position.

E-mail the author at tom.horne@ aopa.org



PICKUP YOUR CLEARANCE • 1 TOUCH EMERGENCY FREQUENCY • WATER RESISTANT • LONG BATTERY LIFE



VXA-150 & VXA-210

WHEN THE GOING GETS TOUGH, you're going to want to grab a Vertex Standard transceiver. We've put our 45 years of communications know-how into the most durable and functional airband transceivers ever. We designed the VXA-150 for Comm, the. VXA-210 for Nav-Comm, and for Nav-Comm plus multi-band, the VXA-700. And we make each unit tough enough to meet military standards. Make sure you're ready the next time tough conditions hit.

- » "Plug and play" headset adapter.
- Transmits at a powerful 5 watts of TX output power
 - "Sips" current from the battery in standby mode
- Weather alerts directly from NOAA
- Back-lit keypad and display

YAESU IS NOW

Vertex Standard CALL US FOR BACKUP 877. 255.7687

ALL POINTS DISTRIBUTING, INC. 1218 N. DIVISION ST. #160 SPOKANE,WA 99218 WWW.ALLPOINTSDIST.COM