

## AVIONICS FLIGHT TEST

# Bendix/King's KLN 94

With crisp color and simple operating logic, KLN89B owners finally have a mid-priced color option.

by Larry Anglisano

Just as buyers awaiting new-generation navigators from Honeywell Bendix/King had all but given up the company for dead, the long-awaited KLN94 color GPS has finally arrived.

Cleverly, Bendix/King has designed this as a pin-for-pin, slide-it-in replacement for the top-selling KLN89B, a sweet deal for owners who waited patiently rather than opting for Brand B's color mapcomm. (Okay, we'll say it; many of 'em dumped the 89B for Garmin's GNS430.)

Was it worth the wait? Generally, we would say yes. Although it's not necessarily an over-the-fence homer, we think the KLN94 is a credible product, with definite improvements over

*The KLN94 nicely matches Bendix/King's new Silver Crown Plus line and is a decent fit with the older KX 155 line, too.*

the 89B and some operating features that match the Garmin line.

Sweetening the deal earlier in the year for some owners, Bendix/King had an attractive trade-up program, allowing KLN89B owners to buy a KLN94 for \$2200 exchange. This has been a popular deal for new Cessna owners whose stacks are loaded with new Silver Crown Plus gear.

### Third Gen

The KLN94 is Bendix/King's third run at the IFR-approved GPS market, the first being the high-priced KLN90B, followed by the KLN89B, which was a mid-market sales smash.

The KLN89B, launched as part of the newly designed Silver Crown Plus line, was easier to operate than the 90B and although its gas discharge dot-matrix type rudimentary moving map depicted special use airspace, it wasn't nearly as crisp as the 90B's CRT.



Nonetheless, the 89B had decent operating logic and an attractive price. For a period in 1996 and 1997, this box kicked butt saleswise, thanks to perfect timing. But then Bendix/King entered its somnambulant phase, with no new products emerging for many months. Garmin and Apollo quickly filled the gap. By then, the KLN89B was stale, mainly due to its

plain display and its operating logic, although not difficult, lacked the GNS430's panache.

No question the GNS430 is a tough act to follow. Still, for the aircraft that has a well-equipped stack of newer generation Bendix/King Silver Crown avionics, the KLN94 will fill a market void. Also, it's the only color, standalone GPS navigator without comm and VOR nav function in its size class. (Garmin's GPS400 and GNC420 are the same size as the 430.)

### Hardware

At first glance the KLN94 looks like a KLN89B—a reworked KLN89B. The front-loading datacard is on the far left of the faceplate. Full aeronautical and airspace data as well as cartographic information such as rivers, roads, lakes, cities and towers are included on the card.

There's a change in the mechanics of datacard function from previous Bendix/King navigators: The aeronautical data is initially contained in the small datacard but when inserted in the unit, data is then stored in a memory area within the receiver.

This action will be apparent when a user changes the datacard as a good 10 to 15 minutes is required for the loading to complete. Not a big deal, but a surprise. The KLN94 utilizes the proven Bendix/King eight-chan-

### Checklist

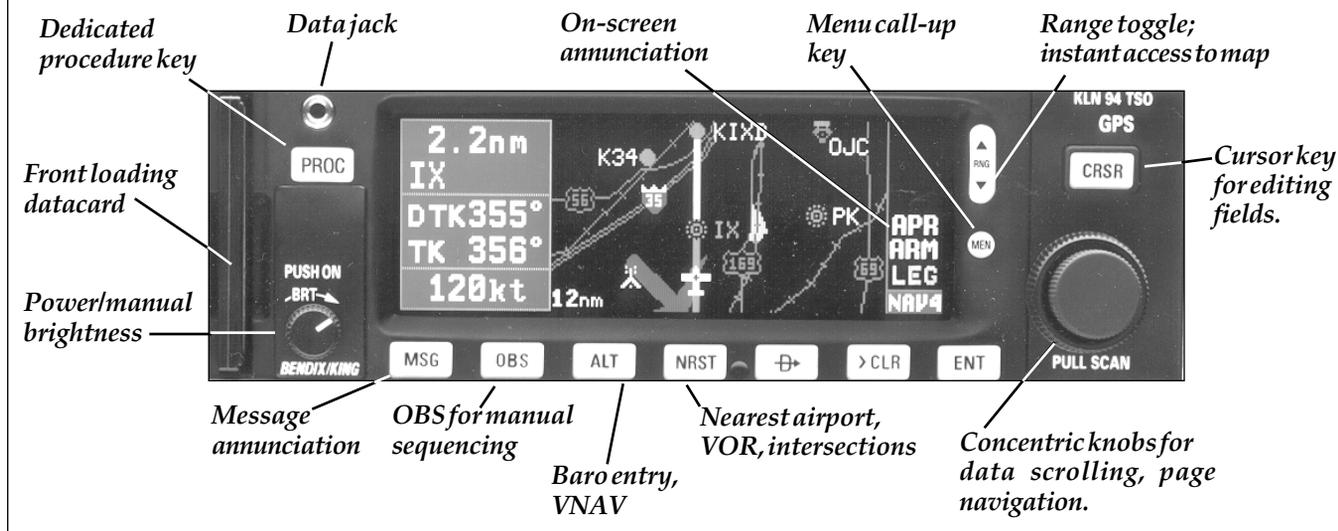


- Screen definition and color quality is well up to Garmin, Apollo standards.
- Menu-driven logic is much improved over KLN89B, especially range toggles.



- Mid-price—\$4152 list—represents color upgrade without spending a bundle.
- Scaling map is easy, but surface detail tends toward clutter due to coarse rendering.
- Some may find the screen size stingy compared to MFDs costing only a little more.

## KLN94 Keys, Knobs and Screen



nel receiver fed by the active KA92 teardrop-style GPS antenna. Weight with mounting hardware is just over 3.5 pounds.

This is a TSO C129a navigator approved for enroute, terminal and approach operations. It is not WAAS compatible, but Bendix/King says some upgrade path will be available, either a board change or trade-in of some sort. Given the uncertain state of WAAS, we simply can't see why any owner should worry about the upgrade.

Installation hardware, including mating connectors, is of high quality, as Bendix/King stuff usually is. Forced air cooling from an avionics fan is essential, however. The 240-pixel wide by 80-pixel high resolution color LCD screen is crisp and comfortable to view in almost all lighting conditions. Very easy on the eyes.

We also noticed that it seems to reach full brightness more quickly than do the Garmin units after a night of cold soaking on the ramp. In very cold conditions, a warm-up page appears advising how long the screen needs to reach normal temp. Don't want to wait? Hit the CLR button to bypass it, but be prepared for sluggish screen operation until the display warms up.

Since the unit is smaller than the Garmin competition, so is the display area, slightly. We found the depiction

of surface detail somewhat coarser than the Garmin variety, thus drilling in the scale to see things more clearly is more frequent.

Controls feel robust and durable and the faceplate matches nicely with the rest of the Silver Crown line. The unit is happy with operating voltages from 13.5 to 27.5 volts, without the need for boost converters; a nice think-through on Bendix/King's part.

Overall dimensions are 6.31 inches wide and 2 inches high, making it an easy replacement for virtually all older navigators. As noted, the KLN94 is a direct pin-for-pin replacement for the KLN89B. Slide the KLN89B out; slide the KLN94 in without any wiring modifications. Well, almost.

The KLN94 displays the annunciation required for IFR GPS certification without the need for remote annunciation. You will, however, need remote switching if you wish to couple an HSI to both the 94 and a navcomm. Garmins do this in the box, since it has an onboard nav receiver. The KLN94 doesn't.

Also, the GPS approach switch/annunciator allows display and control of the KLN94 approach modes. So, we recommend a remote annunciator for primary use while the GPS display conveniently backs up this switching.

The Mid-Continent Instruments

MD41 series ACU is the switch of choice, with a high-end look and superb sunlight readability. Eaton remote switch/annunciators are an alternative if the local FSDO agrees that no ACU is needed.

For IFR approval, a new flight manual supplement will have to be provided as well as all the required flight testing for TSO C129 (A1) approval. Minor stuff.

### Smart Box

These days, a panel without some color display looks drab so the KLN94's screen will give any airplane an immediate state-of-the-art look without a major GNS430 upgrade.

In its latest equipment, Garmin nicely integrated the nav and comm functions and Bendix/King has followed suit. The so-called Quick Tune option allows the KLN94 to talk, via RS232, with KX165A/155A navcomms, autotuning nav and comm frequencies according to aircraft position and selected approach.

If you have a KLN89B and want this feature, however, expect some additional costs as the shop will have to dig into the wiring to add the RS232 interface. We think it's worth the nominal cost.

The box will send nav and comm frequencies to—count'em—four on-

## Big Color or Little Color?

We wish we could say the KLN94 makes the buying decision easier, but it doesn't. Even the owner of a KLN89B will have to ask whether it's better to swap that unit out for a KLN94 or shop for a mid-priced MFD and keep the 89B in the panel to run the larger display.

There are pros and cons for each side of this buying decision. Favoring the straight swap is price. The KLN89B may yield \$1500 to \$2000 in trade value, so a painless and quick conversion to color could cost as little as \$3000 to \$3500.

The downside of that decision is what you see is what you get. The KLN94 has no comm or VHF nav capability and isn't currently WAAS compatible, if you think that matters. (We don't.)

Nor will it accept radar, Stormscope, datalink or other sensors in its current configuration. The Garmin models do, of course, accept most external sensors.

Considering the MFD argument,

board radios capable of receiving the data. But to use the feature, you'll need the newer A-series Bendix/King line, not the old 155s.

On screen annunciation is done on the far right of the display page beginning with WPT (waypoint alert) when approaching the active waypoint. Following underneath is the Malert, which will flash to prompt the user for new messages. VTF—for vector to final—indicates that this mode is armed. It goes to green when activated.

Lines four and five in vertical sequence indicate APR for Approach then ARM or ACTV for approach activation. LEG or OBS is displayed at the bottom of the screen.

These annunciations are handy to have on screen, but again should not be the main source of annunciation, in our view, since the navigator can, in some instances, not be in prime viewing level in the stack. Most FS-DO's want the annunciation within

Bendix/King's own KMD 150, at \$3995 without GPS, comes close to the KLN94 swap-out numbers and yields a large color map with more display options than the KLN94—or even the Garmins—now have.

Further, it's generally accepted that MFDs have more head room than all-in-one navigators or mapcomms. They have more real estate for display and most have been designed from the ground up with upgradeability in mind.

Of late, the market trend has been a box for every purpose, the theory evidently being that giving buyers a vast range of price and capability choices will keep them from running off to the competition. Unfortunately, there may be one unintended effect: With such a jumble of like choices, more owners perch on the fence awaiting the arrival of yet the perfect box and the perfect price.

the pilot's instrument scan. Unit power is cycled via the rotary knob, which does double duty as a display brightness control. There's a 1/8-inch datajack built into the face for uploading database information without pulling the card, for revising data fetched off of Bendix/King's Web site.

New to the KLN94 is the PROC button, whose main function is for initiating and loading an approach and also accessing arrival and departure procedures. The popular vector-to-final command is also accessed here.

Garmin scored big points with the PROC key on the GNS430 and rightfully so. It eliminates the guesswork when loading an approach, as the user is prompted through a series of submenus in the procedures-loading routine.

Without the procedure menu, there's a tendency to botch the initial stages of the load. We like to compare the software to the early days of DOS and

Apple's Mac software. The Mac was annoyingly cute but you could at least understand it, while DOS was dense, illogical and irritating. (Nice to see Honeywell/Bendix/King do its market research.) Function buttons on the KLN94 are similar to the KLN89B, in that keys are sequentially laid out on the bottom of the faceplate from left to right: MSG allows the box to communicate any commands or warnings;

the OBS button switches from Irg to OBS mode; NRST button for nearest airports, VORs, NDBs, intersections; Æ for loading a fix and CLR and ENT for obvious purposes.



New is a range up/down toggle key that selects the moving map scale, a task far from intuitive on the 89B. At any time, the user can call up the map page by simply punching the range key. Map set-up functions (north or track up, display settings, land and airdata) are performed by pressing the tiny MEN key, located under the range toggle. A designated CRSR key quickly allows editing of information in all modes of operation.

The usual outer and inner rotary knobs allow scrolling from page to page within the main menus and for editing alphanumeric or other call-up information. It's relatively easy to move from page to page without confusion and it's reassuring to have the range key bring up the map as the default quickly. The ALT button is used to select two altitude pages that contain barometric pressure settings and VNAV operation.

One nice feature carried over from the 89B is electrical bus monitoring. It allows the pilot to view supplied voltage accurate to tenths of a volt. Voltage alerting allows you to select a specified alert voltage, in case of an alternator failure. So that this alerting doesn't get annoying with voltage transients, low-voltage conditions are timed with selectable alert delays.

And while on the topic of system configuration, we found set-up to be straightforward. Never underestimate the time your shop spends on post-installation set-up and configuration. This is one of the most crucial

and often most time consuming stages of the installation. Our experience with the setup of the first KLN94s has been painless. (Manufacturers take note: If you want to annoy your dealers and have them not push your product, make the set-up difficult. Previous Bendix/King navigators have been awkward to configure but the KLN94 has corrected this shortcoming.)

## Approach Ops

In our view, the Garmin navigators have had a clear advantage in approach operations. Garmin users like prompting for approach selection and initial fix choosing. As noted, the addition of the PROC key to the KLN94 brings this capability to the Bendix/King products.

Also, the Garmins automatically decide on their own whether to suspend sequencing when a procedure turn is required and helpfully prompt the user by displaying suggested headings, including the depicted holding pattern.

The KLN94 lacks this feature but we're told the pattern depiction will be available in a future software upgrade. Manual OBS/Leg will remain, however. To its credit, the KLN94 does a good job of alerting the pilot—"IF REQUIRED, SELECT OBS"—but it's not fully automatic. It also prompts you for the current baro setting.

As required by TSO, the KLN94 will not automatically sequence to the next waypoint on the missed approach. The user must select this waypoint and initiate navigation. By default, the unit nominates the first waypoint of the published missed procedure.

Loading an approach is simple: Select the APPROACH prompt under the procedure menu, then select the approach airport by selecting from one of seven possible identifiers or edit your own identifier in a blank field, then enter. (Closest airports are

given, but the active waypoint airport is at the top of the list.)

You're then prompted with a list of selectable approaches for that airport, followed by selection of an IAF or vectors. You're then asked if you want to add this to the current flight plan. There's almost zero chance for any confusion in this process.

Precision approaches are also loadable for monitoring purposes and the user is warned of this before loading. The unit will, however, monitor an ILS and quick tune the localizer frequency.

In general, we think users should be comfortable with the KLN94's approach operations, with a little practice. Once the software is fine tuned a bit, we think this unit will be the equal of the Garmin offerings.

## Other Features

As do most late-generation navigators, the KLN94 has fuel management. If it's connected via RS232 with a compatible fuel flow computer, real time fuel management is provided on a designated page based on rate of fuel flow, groundspeed and distance.

Headwind and tailwind components are featured on a separate page, rounding out the full-featured E6B options.

The altitude alerting feature is handy if your airplane doesn't otherwise have some sort of alerter. The alert allows the user to select a target altitude, then issues an aural alarm of three chimes 1000 feet prior to, two chimes when reaching the selected altitude and four chimes when leaving this selected target. (The latest baro setting is required for this to work properly.)

Chimes can be interfaced with the audio system (if equipped with audio amplifier) through the cabin speaker or driven to a remote tone generator.

## Recommendations

First, the bottom line. And the bottom line is: It's about time. We're weary of answering reader queries about the KLN94's delay to market. Another few months of delay and Bendix/King would have been a nominee for the Terra-from-Trimble Orphaned Owners award. Frankly, after the long delay, Bendix/King could have stumbled badly if the unit didn't approach Garmin's GNS430 in overall value. In our view, it doesn't stumble and is worthy choice for the *right* crowd. The right crowd is all those new Cessnas with Silver Crown Plus, plus any airplane that has an existing KLN89B—and that's a lot of airplanes.

Beyond that, it's more complex. The KLN94 lists for \$4152. Adding the indicators and wiring, figure on \$5500 to \$6500 installed. Not a bad value against the GPS-only Garmin 400 at \$6795.

The Garmin is larger with a larger screen but the KLN94 may fit where the Garmin won't. Feature for feature, these two units are comparable, in our view. Neither one is a slam dunk walkaway against the other.

This pricing makes the KLN94 competitive and a good value in our view. It also fills a market void as an easy upgrade for KLN89B owners.

With a long list of products scheduled for introduction in the coming months, it's clear that Bendix/King is trying to get back on track after a long snooze. After wringing out the newly introduced KLN94, we think they're off to a good start.

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