

 **GARMIN**® *marketing memo*

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## **GNS 480/CNX80 User Newsletter**

Seventh Edition

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In this special edition for the holidays we want to briefly discuss the new features of software v2.1 and the navigation database upgrade.

### ***New Features in Software Version 2.1***

In this edition we are going to briefly discuss the changes in software version 2.1. This new version will correct some minor software issues as well as add a new interface feature. Additional features are planned in future software upgrades, and I encourage owners and installers to continue providing feedback on the features desired.

The first feature added is the interface to the Pilatus PC-12 fuel flow computer. This will allow the GNS 480 to interface to the PC-12 fuel computer and display the data being transmitted from that system in the user selectable fields in the “blue block” on map pages 2, 3, and 4.

The second enhancement involves both a minor software change and a functional change to accommodate the electronic database changes from Jeppesen.

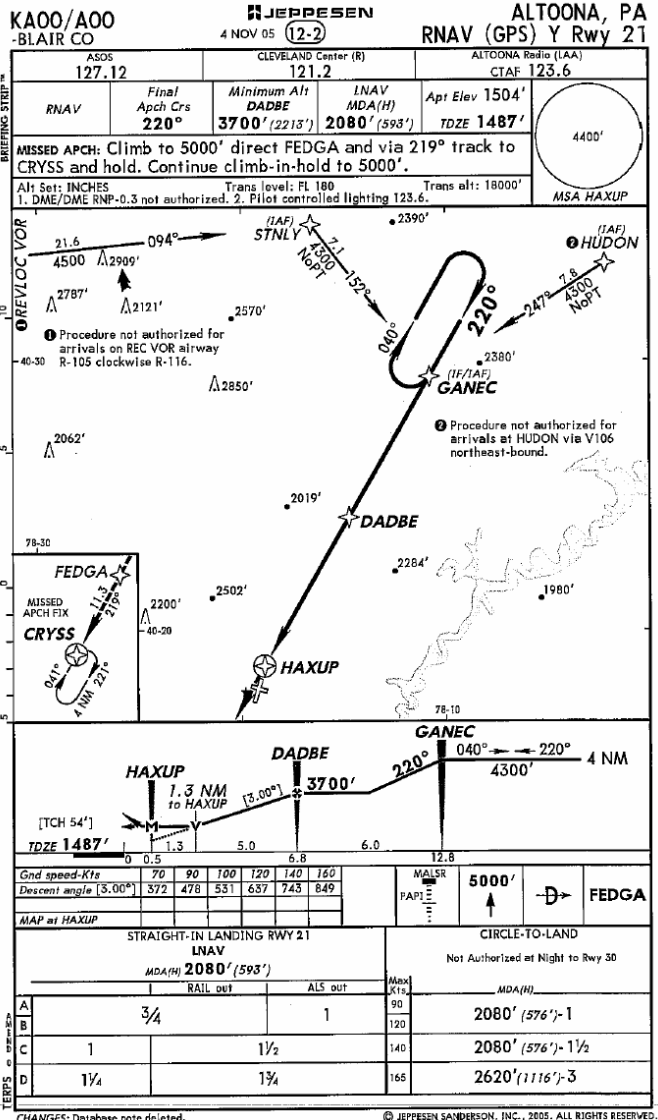
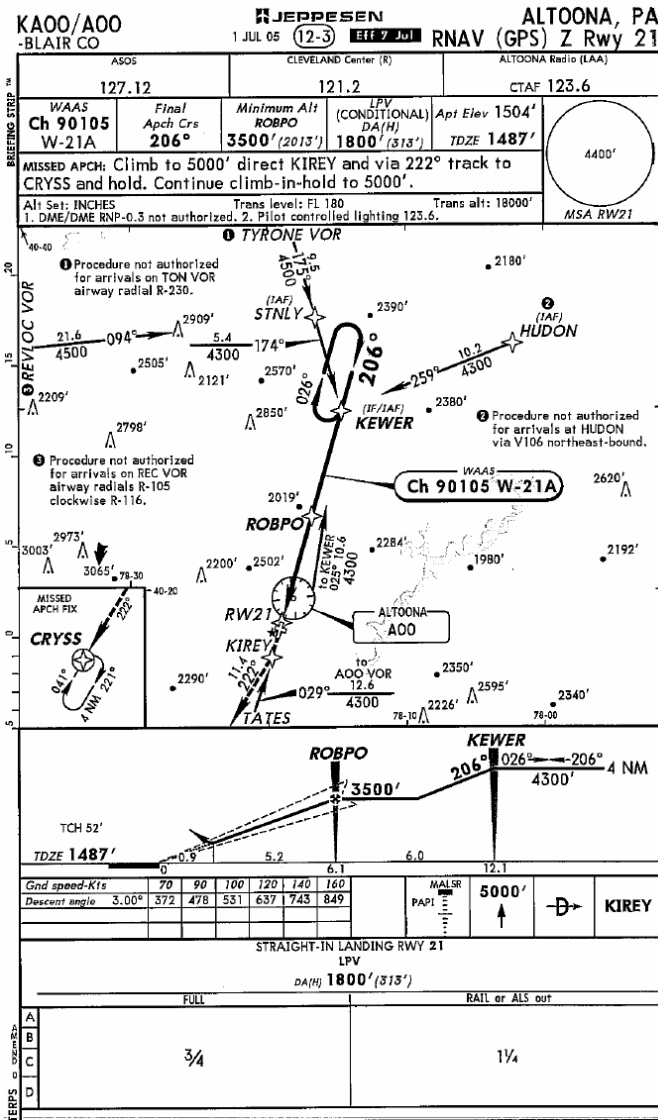
As many of you have noted, the RNAV approaches have proliferated at a substantial rate. There are many LPV approaches now and many approaches in the GNS 480 have either LNAV/VNAV or LNAV with advisory vertical guidance available (annunciated as LNAV/VNAV). The current software (v2.0) has a limitation for 255 LPV approaches. This limitation will be removed in v2.1 and all WAAS approaches will then be supported.

### ***Database Upgrade for Multiple Approaches to the Same Runway***

There is a database change and upgrade which will be automatically inserted into your databases from Jeppesen in the near term. This will provide the GNS 480 with the ability to fly different approaches of the same type (i.e. RNAV) to the same runway.

The FAA has and is continuing to develop numerous RNAV approaches to the same runway as a part of the increased use of GPS for primary navigation and approach. These are indicated in Jeppesen paper charts as either RNAV Y or Z approaches. The Z approaches have vertical guidance associated with them, either to LNAV/VNAV minimums or LPV minimums. Y approaches are non-precision and may or may not support advisory vertical guidance. In this example, the Y approach does, and is indicated by the LNAV/VNAV shown in the approach title.

Coupled with the multiple RNAV approaches to the same runway, you should be aware that the Y and Z approaches differ in some locations. In many situations they are a direct overlay of each other with identical waypoints, but not in all cases. Consider the RNAV approaches to runway 21 at Altoona, PA.



Above are the RNAV Y and Z approach plates, which have the same transition IAFs, but a different IF/IAF waypoints and different inbound courses. The missed approach hold waypoint is the same in both procedures, however there are differences between the approaches here as well, with the Y approach identifying an additional waypoint, FEDGA, on the missed approach procedure and the Z missed approach taking you direct to KIREY.

Generally these kinds of changes are incorporated as the result of terrain or obstacle clearance requirements found in TERPS. You should be aware that there may be fundamental differences between the approach types, even though many overlay each other directly.

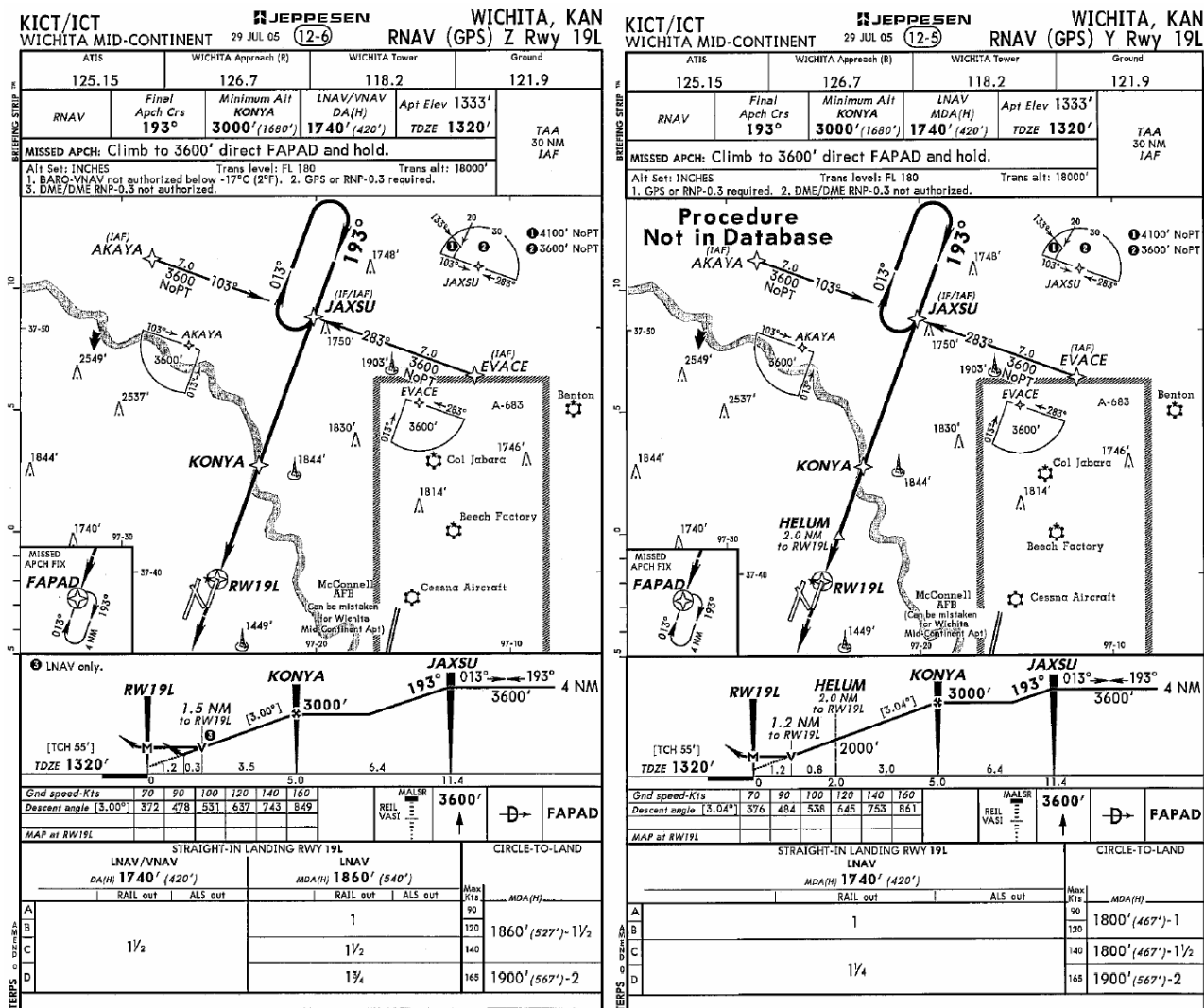
The differences are shown in the GNS 480 flight plan pages shown below with the Y and Z approaches selected with the same IAF (HUDON) chosen. The Y approaches are shown with a Y as the final character in the approach name in the GNS 480. As you might expect the Z approaches have the letter Z as the final character in the approach name and is identified as a LPV approach in the title as they always have. The RNAV 21Y approach is shown below.

ACT 118.000 SBY 118.100 ACT 110.15 --m loc SBY 110.30 ---- 27.3n Rwy Dist/Brg GPS TERM SUSP M	<b>KAOO HUDON</b> <b>RNAV(GPS) 21Y</b> <b>Lnav/Vnav</b>  GPS ILS LOC VOR NDB Approch	ACT 118.000 SBY 118.100 ACT 110.15 --m loc SBY 110.30 ---- 27.3n Rwy Dist/Brg GPS TERM SUSP M	<b>Library</b> DIST      ETE <b>RNAV(GPS) 21Y:</b> BRG 247°      7.8 GANEC      7.8n BRG 220°      6.0 <b>DADBE f</b> <b>13.8n</b> BRG 220°      6.4 HAXUP m      20.1n CRS 220°      0.4 1904ft      20.6n -D>220°      7.3 FEDGA      27.9n ↑↓      FPL
BACK		SAVE EXEC XPND	

Here's a screenshot of the RNAV Z approach:

ACT 118.000 SBY 118.100 ACT 110.15 --m loc SBY 110.30 ---- 27.3n Rwy Dist/Brg GPS TERM SUSP M	<b>KAOO HUDON</b> <b>RNAV(GPS) 21Z</b> <b>LPV W-21A-Z</b>  GPS ILS LOC VOR NDB Approch	ACT 118.000 SBY 118.100 ACT 110.15 --m loc SBY 110.30 ---- 27.3n Rwy Dist/Brg GPS TERM SUSP M	<b>Library</b> DIST      ETE <b>RNAV(GPS) 21Z:</b> BRG 259°      10.2 KEWER      10.2n BRG 206°      6.0 <b>ROBPO f</b> <b>16.2n</b> BRG 206°      6.1 RW21 m      22.3n CRS 206°      0.6 1800ft      22.9n -D>206°      6.8 KIREY      29.7n ↑↓      FPL
BACK		SAVE EXEC XPND	

Another example that is more subtle is the RNAV approaches to runway 19L at Wichita Mid-Continent. The plates are shown below.



The RNAV Y and Z 19L approach at KICT.

The new electronic database will have the RNAV Y approach embedded in it, although the current release of the paper chart indicates the procedure is not in the database. Note the differences between the approaches from the FAF at KONYA to the runway. The Y approach has an additional waypoint, HELUM, which is not embedded in the electronic database and can only be identified by the distance to the runway. The vertical paths are also slightly different with the LNAV/VNAV approach set at 3 degrees and the advisory vertical guidance set at 3.04 degrees.

Also be aware that the RNAV Z approach may be flown as either an LNAV/VNAV or LNAV approach, whereas the RNAV Y approach is LNAV only.

There is another subtle issue at work with these two approaches, namely the LNAV MDA. By being able to identify HELUM a substantially lower MDA can be obtained. In situations where WAAS is not available or VPL exceeds 50 meters (located on the SYS page showing GPS performance data) vertical guidance will not be available. In those cases, selecting the RNAV Y approach would be a better choice allowing a lower MDA. If sufficient performance to provide vertical guidance is not available, the RNAV Z approach will be automatically downgraded as it is currently.

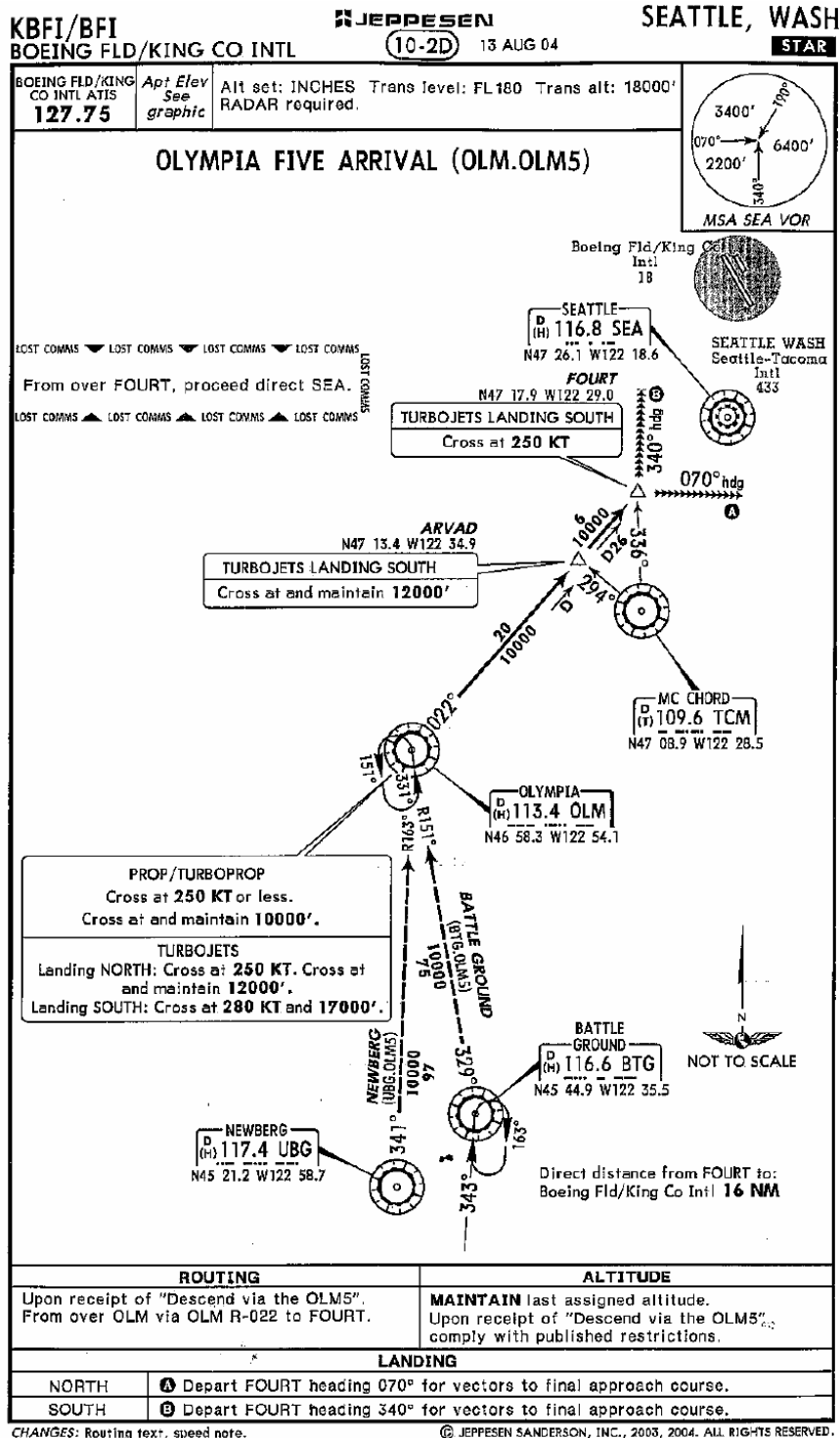
Please be aware when choosing RNAV approaches that these differences exist and the similarities between the approaches to the same runway can be confusing. The primary difference in these would be the minimums associated with the approach and the fact that the LPV minimum is a DA and the RNAV Y approach with or without advisory vertical guidance would be an MDA and treated accordingly.

As we have emphasized in the past, reasonable care should be exercised when selecting and reviewing the approach prior to the IAF.

# Arrival Procedure Insertion "Smart Search" Feature

A couple of questions have arisen lately from customers and as a result I thought it would be wise to add a short review and discussion of the "smart search" feature in the GNS 480.

I'll provide a brief example of how this works. We do a lot of traveling back a forth to Seattle's Boeing Field for various reasons. The ATC clearance from KSLE to KBFI is a canned one that rarely changes. Seattle approach uses a four post arrival system and one of those posts is the OLM VOR. The clearance is: KSLE - UBG - V165 - OLM. The Olympia 5 arrival is usually assigned.



You'll quickly notice that there are only two transitions to this STAR, UBG and BTG VOR. The assigned route is an airway between UBG and OLM which contains a course change, and not the direct leg associated with the STAR. Inserting the OLM 5 STAR requires the selection of an IAF, which as mentioned will be either UBG or BTG. Those are the coded IAF's in the database that the

GNS 480 can see. To accommodate clearances like this, the GNS 480 will insert the procedure by checking the active flight plan and inserting those legs remaining in the procedure after the last active waypoint.

In this case, the system would search the active flight plan and would see that OLM is the final waypoint, truncate the procedure and add the legs from OLM to ARVAD and FOURT in to the modified flight plan, satisfying the clearance from ATC to join the STAR after OLM. At that point, you're finished with the STAR insertion.

If the terminating waypoint in the active flight plan is not OLM, then the procedure will be inserted in its entirety, including the transition leg. The STAR will be inserted after the last waypoint in the active flight plan and a discontinuity inserted between the last waypoint in the active flight plan and the first waypoint in the STAR. You may resolve this by deleting waypoints and the discontinuity appropriately until the waypoints are in the correct sequence prior to executing the modifications.

## *Other Topics*

Please let us know if you have any questions or comments. Many of you have and we do appreciate the feedback allowing us to directly address your questions, concerns, and providing you with the best customer service we can.

We certainly hope your Christmas and New Year's Holidays are enjoyable. We would like to extend our appreciation for your support of Garmin products and we hope the coming year is a prosperous one for each of you.

Please feel free to contact us by visiting [www.garmin.com](http://www.garmin.com) and send your comments to the technical support group ([support.salem@garmin.com](mailto:support.salem@garmin.com)): Attention Paul Damschen, Flight Test.

This Newsletter along with the first six editions can be found on the web at: [www.garmin.com/products/gns480/](http://www.garmin.com/products/gns480/)