



## Service Bulletin

**SB 81438-XX-00-16**

**Rev. C**

**2000 Approach Plus GPS Navigation Systems, Part Numbers 81438-02-XXXX, 81438-03-XXXX and 81438-12-XXXX.**

**Release of operating system –240N.**

**SUMMARY:** FreeFlight Systems has released software system –240N for the 2000 Approach Plus.

### **I. PLANNING INFORMATION**

#### **A. Effectivity**

This Service Bulletin applies to the 2000 Approach Plus GPS Navigators, Part Numbers 81438-02-XXXX, 81438-03-XXXX and 81438-12-XXXX, where XXXX equals the system operating software.

Installation of software version –240N is optional, however FFS strongly encourages operators to incorporate the change, especially those using the larger North American data base. Without the “N” update, long computational delays in processing flight planning operations (such as direct-to) may be observed.

Continued IFR operations after June/2009 will require software version -240M or later approved, in order to support the 4 MB Nav data bases.

**Installation of software version –240N also requires implementation of hardware service bulletin 81438-XX-34-14 to support 4 MB Nav data base operation, unless previously performed.**

#### **B. Reason**

This Service Bulletin advises all users of 2000 Approach Plus Navigators, Part Numbers 81438-02-XXXX 81438-03-XXXX and 81438-12-XXXX, of the availability of a revised operating system, -240N.

The following change has been incorporated into software version –240N:

- Improved overall system response time

- Improved presentation of DME arcs on serial outputs and corrected a problem with joining DME arcs
- Fixed representation of PTURN waypoints in serial outputs
- Fixed problem with system restarts when a DME arc is preceded by the DME arc center waypoint
- Changed representation of direct-to waypoint to avoid compatibility issues with some MFDs
- Fixed navigator restart problem when accessing airspaces with long airspace names
- Disallowed editing of SIDs and STARs, since doing so resulted in terminal waypoints not being found in the procedures
- Fixed problems with flight plan distance display after modification to a flight plan
- Improved annunciation of external altitude input messages

**C. Description**

Operating system –240N is loaded using a FLASH EDGE card.

**D. Approval**

Operating software version –240N is a minor modification to version –240M, which was previously approved under TSO C129 (A1). 2000 Approach Plus installations that have been FAA approved with software programs other than –240x must be reevaluated when software version –240N is installed.

**E. Manpower**

The following man-hour estimates are based on incorporation concurrent with an unscheduled repair or during routine maintenance:

Units	Compliance	Man Hours
All RDUs	During Routine Maintenance	0.5
All RDUs	During Repair	0.5

**F. Weight and Balance**

None

**G. Electrical Load Data**

Not Affected

**H. Reference**

ECN S10001

ECN S10006

**I. Other Publications Affected**

- 84919, Rev A      FreeFlight 2000 Approach Plus Pilot Guide Supplement
- 84925, Rev A      FreeFlight 2000 Approach Plus GPS Receiver Installation and Checkout Manual Supplement

**J. Interchangeability and Identification**

Modified and unmodified units are not interchangeable.

2000 Approach Plus GPS Navigation Systems having operating system –240N shall be identifiable by the Identification label on the top of the unit, bearing part number 81438-XX-240N.

## II. MATERIAL INFORMATION

### A. Price and Availability

Call FreeFlight Systems for price and availability at time of purchase.

Note: Upgrading to 240N from 240M is a no-cost upgrade, as the 4MB card, manual supplements and hardware modification are not needed.

All operators will be charged a \$300 media/handling fee for each PCMCIA card shipped. Operators who return a serviceable card within 90 days will receive credit. Observe handling precautions with each card to ensure reasonable protection of the card (normal wear and tear is acceptable). The fee will be due and payable for cards that are not returned and for cards returned in unserviceable condition. Return cards to FreeFlight Systems, Attention Sales Department (see address below), to receive credit.

Customers have two choices. They may elect to send Navigators to the FreeFlight Factory Service Center or they may send units to an authorized Level II Service Center for installation of this software upgrade.

Modifications accomplished at the Factory Service Center will be completed within fifteen (15) working days after receipt of the unit, depending upon parts availability.

Level II Service Centers wishing to incorporate Service Bulletin 81438-XX-00-16 should issue a purchase order to FreeFlight for the number of Service Bulletin kits required.

### B. Parts List

Service Bulletin Kit 81438-XX-00-16 contains:

FreeFlight PN	Qty	Nomenclature	Notes
82998-240N	1	Flash Card loaded with 2000 Approach Plus operating system v. -240N Rev. B	1
81461-XX	1	4 MB datacard	2 & 3
81941	1	Part Number Identification Label	
SB 81438-XX-00-16 Rev. C	1	Service Bulletin Document (this document)	
84919, Rev A	1	FreeFlight 2000 Approach Plus Pilot Guide Supplement	3
84925, Rev A	1	FreeFlight 2000 Approach Plus GPS Receiver Installation and Checkout Manual Supplement	3

**Note 1:** An invoice for \$300 for the flash card will accompany the Service Bulletin kit. Operators who return an undamaged flash card within 90 days to FreeFlight Systems, Attention Sales Department (see address below), will receive credit.

**Note 2:** Please state which database is required, North America (81461-10), Eurasia (81461-12), or Pacific South America (81461-13).

**Note 3:** This item is not needed for units previously running 240M software

### C. Ordering Information

Operators of the 2000 Approach Plus wishing to upgrade their system may send the unit(s) to an approved Level II Service Center or the FreeFlight Factory Service Center.

To upgrade the operating system at a Level II Service Center, send a purchase order requesting Service Bulletin kit P/N 81438-XX-00-16 to:

FreeFlight Systems	Attn.: Sales Dept.
3700 Interstate 35 S.	Telephone 1 (254) 662-0000
Waco, TX 76706 USA	Fax 1 (254) 662-9451

For FreeFlight Factory Service Center modification, send the Navigator and a purchase order requesting incorporation of Service Bulletin 81438-XX-00-16 to:

FreeFlight Systems	Attn.: Repair Dept.
3700 Interstate 35 S.	Telephone 1 (254) 662-0000
Waco, TX 76706 USA	Fax 1 (254) 662-9452

### D. Warranty

This Service Bulletin does not affect the standard warranty of the unit from date of purchase. For units out of warranty, this modification will be covered for ninety (90) days.

## III. ACCOMPLISHMENT INSTRUCTIONS

### A. Record Configuration Settings

Software loading will erase the installation settings and the user settings. Therefore, it is important to record these settings before installing the revised software. For information about installation settings, refer to the *2000 Approach Plus GPS Navigation System Installation and Checkout Manual*, PN 82878 (Section III - Checkout). Following the instructions, access the Installation Set Up submenu.

1. Record the configuration settings on the Configuration Record Sheet found in Section III of the manual.
2. Turn unit off.

Two sets of loading instructions follow. The instructions in Section III.B are for loading version -240N over version -240B, 240C, -240D, -240E or 240M. The instructions in Section III.C are for loading version -240N over versions -0240 or -240A.

**B. Instructions for Updating the 2000 Approach Plus Operating System from Version -240B, -240C, -240D, -240E or -240M.**

1. Inspect the provided flash card, P/N 82998-240N, and verify that it contains the following text on the label:

FreeFlight Systems  
PN 82998-240N  
SYSTEM: 240N  
Rev B  
NIOP: 2.822  
CRC: 9BD0-A888  
GPS: 5.05-1208  
CRC: B72A-A2D5  
Not A Jeppesen  
Database Card

2. Insert the flash card into the memory card slot on the front of the unit.
3. Turn power ON to the 2000 Approach Plus. The unit will begin its startup procedure.
4. Verify that the following message is displayed:

FLASH CARD DETECTED  
AVAILABLE VERSIONS:

It will be followed by:

NAV: 2.822      9BD0A888  
PUSH NAV TO CONTINUE

5. Verify that the software version and CRC on the top line of the display match the above text. If not, then terminate the programming procedure immediately and contact FreeFlight.
6. Press **NAV**. The following message will appear.

GPS: 5.05B      B72AA2D5  
PUSH NAV TO CONTINUE

7. Verify that the Software Version and CRC on the top line of the display match the above text. If not, then terminate the programming procedure immediately and contact FreeFlight.
8. Press **NAV**.
9. Verify that the following messages are displayed. A pattern will scroll across the bottom line of the display to indicate that the image verification process is taking place.

VERIFYING IOP IMAGE  
VERIFYING GPS IMAGE

After successful image verification, the following message will appear:

FLASHCARD GPS AND  
IOP IMAGES OK

A message quickly flashes by and then the following appears.

UPDATE GPS CARD NOW?  
NAV = YES    AUX = NO

10. Press **NAV**. The following message will appear.

UPDATING GPS FLASH

It is followed by:

GPS FLASH UPDATE OK  
PRESS NAV TO CONT

11. Press **NAV**. The following message will appear.

UPDATE NAV IOP NOW?  
NAV=YES    AUX=NO

12. Press **NAV**. The following message will appear.

UPDATING IOP FLASH

After the update is complete, the unit will reset. Then it will display this message:

PERFORMING BUILT IN  
TEST

CLEAR BATTERY BACKED  
MEMORY SUCCESSFUL

FreeFlight  
2000 Approach

SYSTEM CODE: 240N  
c2010

It is followed by:

IOP ROM UPDATED OK  
PWR OFF, REMOVE CARD

13. Turn the unit OFF. Remove the flash card from the memory card slot and insert a database card (P/N 81461-XX).

14. Turn the power ON.

15. Verify the following message on the display:

SYSTEM CODE: 240N  
c2010

It is followed by the VALIDATING DATABASE screens, then:

THE FUTURE OF  
AIRCRAFT GUIDANCE

Observe the following scroll up the screen.

NAV Computer --OK  
GPS Computer --OK  
Database --OK

or

Database Expired  
Ready for Navigation  
Select any mode

16. Press AUX until the SYSTEM STATUS screen is displayed.
17. Rotate the small knob clockwise until the following screen is displayed:  
REVISION: NAV 2.822  
GPS 5.05-1208
18. Verify that the NAV IOP software version matches the line above.
19. Rotate the small knob clockwise one click and verify that the following line is displayed:  
SYSTEM CODE: 240N  
c2010
20. Press the MSG key and check for any of the following error messages.  
GPS CONFIG INVALID  
IFR NOT ALLOWED  
S/W CONFIG INVALID  
IFR NOT ALLOWED
21. If any of the above messages appear, perform the software loading again. If there are still error messages after the second attempt, call FreeFlight.
22. Updating the 2000 Approach Plus to operating system version -240N from version -240B, -240C, -240D, -240E or 240M is complete. Go to Section D, Identification.

### **C. Instructions for Upgrading the 2000 Approach Plus Operating System to Version -240N from Version -0240 or -240A**

**IMPORTANT NOTES  
PLEASE READ AND FOLLOW CAREFULLY**

**The software MUST be loaded in the correct order, as described in the instructions immediately following this box. The loading options on the 2000 Approach Plus display will not be presented in that order. Therefore, take care to follow the loading directions in this Service Bulletin EXACTLY IN SEQUENCE AS WRITTEN.**

**DO NOT cycle power during the loading process except where noted in the instructions. Cycling power during software loading will damage the unit. If this occurs, the unit must be returned to FreeFlight for repair.**

1. Inspect the provided flash card, P/N 82998-240N, and verify that it contains the following text:

FreeFlight Systems  
PN 82998-240N  
SYSTEM: 240N  
Rev. B  
NIOP: 2.822  
CRC: 9BD0-A888  
GPS: 5.05-1208  
CRC: B72A-A2D5  
Not A Jeppesen  
Database Card

2. Insert the flash card into the memory card slot on the front of the unit.
3. Turn power ON to the 2000 Approach Plus. The unit will begin its startup procedure.
4. Verify that the following message is displayed:

FLASH CARD DETECTED  
AVAILABLE VERSIONS:

It is followed by:

NAV: 2.822      9BD0A888  
PUSH NAV TO CONTINUE

5. Verify that the software version and CRC on the top line of the display match the above text. If not, then terminate the programming procedure immediately and contact FreeFlight.
6. Press **NAV**. The following message will appear.

GPS: 5.05B      B72AA2D5  
PUSH NAV TO CONTINUE

7. Verify that the Software Version and CRC on the top line of the display match the above text. If not, then terminate the programming procedure immediately and contact FreeFlight.
8. Press **NAV**.
9. Verify that the following messages are displayed. A pattern will scroll across the bottom line of the display to indicate that the image verification process is taking place.

VERIFYING IOP IMAGE  
VERIFYING GPS IMAGE

After successful image verification, the following message will appear:

FLASHCARD GPS AND  
IOP IMAGES OK

A message quickly flashes by and then the following appears.

UPDATE GPS CARD NOW?  
NAV = YES    AUX = NO

10. Press **AUX**. (If you make a mistake and press NAV, cycle power and start over.)

The following message appears:

UPDATE NAV IOP NOW?  
NAV = YES    AUX = NO

11. Press **NAV**. The following message will appear.

UPDATING IOP FLASH

After the image verification is complete, the unit will reset and then display this message:

PERFORMING BUILT IN TEST  
CLEAR BATTERY BACKED  
MEMORY SUCCESSFUL

The unit will go through the startup sequence. (The following display will appear if version -240N is being loaded over -240A, but not if it is being loaded over -0240. **DO NOT REMOVE THE CARD!**)

IOP ROM UPDATED OK  
PWR OFF, REMOVE CARD

12. Turn OFF power to the 2000 Approach Plus. Wait 30 seconds. Turn ON power to the unit.

13. Verify that the following message is displayed:

PERFORMING BUILT IN TEST

Then the unit will reset. Afterward it will display:

FreeFlight  
2000 Approach

SYSTEM CODE: 240N  
c2010

FLASH CARD DETECTED  
AVAILABLE VERSIONS:

This is followed by:

NAV: 2.822      9BD0A888  
PUSH NAV TO CONTINUE

14. Verify that the software version and CRC on the top line of the display match the above text. If not, then terminate the programming procedure immediately and

contact FreeFlight.

15. Press **NAV**. The following message will appear.

GPS: 5.05B     B72AA2D5  
PUSH NAV TO CONTINUE

16. Verify that the Software Version and CRC on the top line of the display match the above text. If not, then terminate the programming procedure immediately and contact FreeFlight.

17. Press **NAV**.

18. Verify that the following messages are displayed:

VERIFYING IOP IMAGE  
VERIFYING GPS IMAGE

After successful image verification, the following message will appear:

FLASHCARD GPS AND  
IOP IMAGES OK

A message quickly flashes by and then the following appears:

UPDATE GPS CARD NOW?  
NAV = YES     AUX = NO

19. Press **NAV**. The following message will be displayed:

UPDATING GPS FLASH

It is followed by:

GPS FLASH UPDATE OK  
PUSH NAV TO CONT

20. Press **NAV**. The following message will be displayed:

UPDATE NAV IOP NOW?  
NAV = YES     AUX = NO

21. Press **NAV**. The following message will be displayed:

UPDATING IOP FLASH

After the flash update is complete, the unit will reset. Then it will display this message:

PERFORMING BUILT IN TEST  
CLEAR BATTERY BACKED  
MEMORY SUCCESSFUL

The unit will reset. Then the following message will be displayed:

IOP ROM UPDATED OK  
PWR OFF, REMOVE CARD

22. Turn the unit OFF. Remove the flash card from the memory card slot and insert a 4 MB database card (P/N 81461-XX).

23. Turn the power ON. The unit will display this message:

## PERFORMING BUILT IN TEST

Then the unit will reset.

24. Verify the following message on the display:

SYSTEM CODE: 240N  
c2010

It is followed by the VALIDATING DATABASE screens, then:

THE FUTURE OF  
AIRCRAFT GUIDANCE

25. Observe the following scroll up the screen.

NAV Computer           --OK  
GPS Computer           --OK  
Database                --OK

or

Database                Expired

Ready for Navigation  
Select any mode

26. Press AUX until the SYSTEM STATUS screen is displayed.
27. Rotate the small knob clockwise until the following screen is displayed:
- REVISION:    NAV 2.822  
GPS 5.05-1208
28. Verify that the NAV IOP software version matches the line above.
29. Rotate the small knob clockwise one click and verify that the following line is displayed:

SYSTEM CODE: 240N  
c2010

30. Press the MSG key and check for any of the following error messages.

GPS CONFIG INVALID  
IFR NOT ALLOWED  
S/W CONFIG INVALID  
IFR NOT ALLOWED

If any of the above messages appear, perform the software loading again. If there are still error messages after the second attempt, call FreeFlight.

### D. Identification

When the software has been successfully loaded with no errors reported, the flash update procedure is complete and the operating software is version -240N. Remove the old identification label on the top of the unit and replace it with the Part Number Identification Tag (PN 81941) that was provided in the Service Bulletin kit.

## E. Perform System Reset

### NAVIGATOR RESET

**Upon completion of this procedure, the unit will be in "cold start" mode. Please allow up to 15 minutes for GPS acquisition.**

#### Memory Reset –

1. With UUT turned OFF, simultaneously press and hold the following keys:  
**NAV, NRST and -D-**
2. Turn UUT power ON and continue holding the keys above until the following message appears:  
**CLEAR BATTERY BACKED  
MEMORY SUCCESSFUL**
3. Release the keys.
4. Turn the UUT power OFF.
5. Turn the UUT power ON. Monitor the display and verify message from Step 2 above.

End of Reset Procedure

## F. Restore Configuration Settings

Restore the configuration settings that were recorded prior to loading software. For installation settings, refer to the *2000 Approach Plus GPS Navigation System Installation and Checkout Manual*, PN 82878 (Section III - Checkout). Instructions for accessing the user setup mode and configuring the settings are in the *2000 Approach Plus GPS Navigator Pilot Guide*, PN 82877, Appendix C.